INTERIOR POINT METHODS FOR
MATHEMATICAL PROGRAMMING :
A BIBLIOGRAPHY

Eberhard Kranich[1]

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[1]FB Wirtschaftswissenschaften und Operations Research, FernUniversität Hagen, P.O. Box 940, D–5800 Hagen, West–Germany

Abstract

Nothing is older than a yesterday's newspaper! In this sense, this bibliography is incomplete, of course, because of the enormous interest and ongoing research in interior–point methods for mathematical programming. These activities were initiated by Karmarkar's polynomial–time linear programming algorithm in 1984, resulting in a flood of research papers, articles, talks, developments of commercial software and so on. This working paper should be regarded as a first trial to obtain a survey over the research reports, journal articles, etc., published so far, resp. known to the author.

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Key Words : Karmarkar's algorithm, interior–point methods, projective scaling algorithm, affine scaling algorithm, path–following methods, logarithmic barrier function algorithm, potential reduction algorithm, trajectory–following method, polynomial–time algorithm, method of centers, gravitational method, box method, mathematical programming.

Remark : The reader is kindly requested to send those references to the authors which are not listed or incorrectly cited in this bibliography (if possible, a copy of the corresponding report or the article's citation with the (complete!) name of the journal, with a short abstract, cross–references and keywords), or to send a copy of his own reference list (can be handwritten!) in order to complete the current bibliography[2]. The actual list will be published elsewhere from time to time, possibly by e–mail.

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Introduction

Interior–point methods for mathematical programming are known for a long time. With respect to solving nonlinear programming problems they have turned out to be a reliable tool, see e.g. Fiacco and McCormick[196], Frisch[227, 228],Huard[358], and Lootsma[480]. But in view of solving linear programming problems they could not compete with G. B. Dantzig's simplex method. They were only regarded as theoretical alternative solution methods to, never as practical substitutes for the simplex method, see e.g. Brown and Koopmans[109], Caroll[111], Dikin[160, 161], Frisch[230], and Parisot[654]. That these methods have failed in linear programming practice at that time can be justified by the lack of modern numerical linear algebra[3] and sparse matrix technologies[4], see e. g. Marsten et al.[511].

A new polynomial–time linear programming interior point–method was presented by N. K. Karmarkar in 1984, which was claimed to be up to 100 times faster than the simplex method, in practice and for any instance. Karmarkar's announcement stirred the interest not only of the popular press, see e.g. Angier[21], Emmett[182], Fricker[226], Garfunkel et al.[234], Gleick[259], Kolata[448], Philpott[656], and Stipp[774], but also of the operations research community, see e.g. the surveys of Bazaraa et al.[80], pp. 416–418, Freund[220], Gill et al.[251], Goldfarb and Todd[281], Megiddo[524, 525], Monma[590], Todd[808, 812], Zimmermann[990], and, in some sense, den Hertog[333].

Since Karmarkar's publications[403, 404], a great amount of contributions has been made towards the theoretical analysis and practical implementations of interior–point methods, see e.g. Anstreicher[30], Bayer and Lagarias[77, 78], Lagarias[466], and Monma[591], and the investigations are still going on, see the David II–Report[154], and Resende and Wright[692]. The importance of interior–points methods is reflected by numerous talks, workshops and minisymposia held at various operations research or optimization meet-

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[3]A. George and J. W. H. Liu, *Computer Solutions of Large Sparse Positive Definite Systems*, Prentice Hall, 1981.

[4]S. Pissanetzky, *Sparse Matrix Technology*, Academic Press, 1984.

ings, see e.g. the programs of the annual meetings of ORSA/TIMS or SIAM, Dolecki[170], Freund[220], Megiddo[526, 529], and Tovey[848, 849].

In order to get an overview, interior–point methods can be broadly classified into the following categories, see e.g. den Hertog[333], whereby the selected citations are thought as examples :

1. Projective scaling methods, introduced by Karmarkar[403, 404] and further investigated and extended e.g. by Akguel[17], Anstreicher[24, 25, 32, 35, 40], Asic et al.[53], Bazaraa et al.[80], Blair[93], Dennis et al.[155], Dodani and Babu[169], Ferris and Philpott[192], Franklin[206], Gay[237], de Ghellinck and Vial[244], Goldfarb and Mehrotra[278, 279], Gonzaga[292, 306], Hettich and Margraff[345], Hooker[350], Kojima[430], Kojima and Tone[447], McDiarmid[517], Mitchell[563], Mitchell and Todd[570, 571], Paris[653], Powell[677], Roos[697], Shanno[737], Shanno and Marsten[746], Shub[755], Steger[773], Todd[810], Todd and Burell[821], Tomlin[835], Vial[895], Ye[951, 956], Ye and Kojima[965], Zimmermann[992].

2. 'Pure' affine scaling methods, originally proposed by Dikin[160, 161, 162] about twenty years ago, independently rediscovered by e.g. Barnes[63], Cavalier and Soyster[116], Monma and Morton[592], Vanderbei et al.[888], and further investigated by e.g. Adler et al.[9], Barnes et al.[72] (belongs in principle to the class of path–following methods), Cavalier and Schall[115], Christiansen and Kortanek[138, 139], Hettich and Ries[346], Kortanek and Shi[457], Marsten et al.[507], Mehrotra[540], Monteiro et al.[601] (the polynomiality is derived from the polynomial result of path–following methods !), Ponnambalam and Vanelli[671], Resende and Veiga[690], Sherali[751] (in principle a path–following method), Strang[781, 782, 783], Todd[819], Wei[900, 901].
Megiddo and Shub[532] have shown that algorithms belonging to this class can be supposed to be non–polynomial.

3. Path– or trajectory–following methods, initiated by Gill et al.[253], showing a certain equivalence to Karmarkar's algorithm, and further investigated by e.g. Anstreicher et al.[43], Ben–Daya and Shetty[83, 82], Goldfarb and Liu[275], Gonzaga[291, 302], Gonzaga and Todd[308], den Hertog et al.[335], Kojima et al.[443], Lustig[484], Lustig et al.[494, 492], Marsten et al.[511], Marxen[513], McShane et al.[520], Megiddo[528], Mehrotra[542], Mehrotra and Sun[549], Monteiro and Adler[598, 599], Osborne[636, 637], Renegar[682], Roos[704, 705],Todd[817], Todd and Vial[824], Tseng[853], Vaidya[869], Zhu and Kortanek[986].

4. Affine scaling methods applied to a potential function, described in Anstreicher and Bosch[41], Freund[221], Gonzaga[295, 299, 303], Ye[959].

5. Method of centers, described e.g. in Boggs et al.[100, 102], Jarre[375, 378, 381], Jarre et al.[383], Mehrotra and Sun[552], Sonnevend[763, 765, 766], Witzgall et al.[908].

6. Gravitational method, developed in Murty[612, 613] and implemented by Chang and Murty[121].

7. Box method, as described in Zikan and Cottle[987, 988, 989].

Algorithms belonging to the class 4 are the most promising, because they do not loose their theoretical complexity in practice. Unfortunately, no computational experiences are published, at least as yet.

During the last few years practical implementations of linear programming interior–point methods were developed, which are superior to the simplex method, not necessarily for each special problem, but at least for a set of problems, such as Gay's *netlib* problem collection, see e.g. Lustig[486], Marsten et al.[507, 511], McShane et al.[520]. For solving everyday linear programming problems there exists a rule of thumb : If the problem size is small, i.e. the number of variables is lower than 500, the simplex method is superior in most cases and consequently 'still alive', otherwise solve the problem via an interior–point method.
Nowadays, there exist at least two commercial implementations. The first one is OB1, developed by Shanno and Marsten[747], see also e.g. Lustig et al.[497], and the second is the AT & T KORBX Linear Programming System[55, 126], a software/hardware combination.

A concluding remark : Talks, workshops and minisymposia are handled as technical reports, because I am rather sure that to each talk there exists an underlying report.

Title word cross-reference

$Big - M$ [445]. L [670]. L_1 [714, 752]. L_∞ [714]. $log\ x$ [117]. $O((m + n)n^2 + (m + n)^{1.5}nL)$ [869]. $O(n^{0.5}L)$ [342]. $O(n^{3.5}L)$ [549]. $O(n^3L)$ [580, 583, 582, 955, 41, 275, 291, 543, 578, 596, 705, 959]. $O(n^pL)$ [580]. $O(nL)$ [843, 308, 298, 446, 519, 822, 963, 969]. P [440, 938]. P_0 [652].

1990s [154].

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5th [170].

'91 [616].

absolute [555]. **Accelerating** [797, 799]. **Acceleration** [627]. **acceptance**
[25]. **accuracy** [500, 832]. **Active** [898, 845]. **adaptation** [429, 890].
adaptive [382, 426, 582, 588]. **Adding** [240]. **Adopting** [18]. **advanced**
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U.S. [154]. **unbounded** [816]. **Unconstrained** [196, 187]. **underlying**
[411]. **unified** [246, 438, 437, 512, 742, 895]. **uniform** [440]. **unifying** [132].
unimodular [312]. **University** [144]. **unknown** [278]. **unrestricted**
[566, 572]. **unsolvable** [321]. **unstandard** [984]. **updates** [203, 297, 543].
updating [42, 104, 564, 579, 719]. **upper** [359, 828]. **USA** [55, 144, 467].
use [343, 509, 537, 706, 747, 897]. **Using** [75, 88, 103, 186, 267, 425, 59, 84,
107, 120, 133, 139, 326, 329, 415, 476, 485, 536, 548, 574, 564, 565, 567, 570,
571, 568, 573, 578, 633, 646, 652, 658, 668, 735, 821, 873, 898, 900]. **utilisant**
[831]. **utilization** [831].

v [374]. **Validation** [829, 833]. **value** [278, 555, 774]. **Varetz** [170].
variable [155, 865]. **variables**
[104, 134, 181, 243, 430, 505, 546, 566, 572, 821, 816, 828, 877, 956, 988].
variant [35, 89, 120, 155, 237, 261, 277, 340, 337, 372, 373, 371, 394, 572,

Bibliography

[1] S. S. Abhyankar, T. L. Morin, and T. B. Trafalis. Efficient faces of polytopes : Interior point algorithms, parameterization of algebraic varieties, and multiple objective optimization. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 319–341. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[2] I. Adler. A primal–dual implementation of Karmarkar's algorithm. Talk held at the ORSA/TIMS Joint National Meeting in Atlanta, GA, USA, Operations Research Center, University of California, Berkeley, CA 94720, USA, November 1985.

[3] I. Adler. Computational tests of the Karmarkar algorithm. Talk held at the SIAM Conference on Optimization in Houston, TX, USA, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, May 1987.

[4] I. Adler. Implementation issues of path–following algorithms for linear programming. Talk held at the EURO/TIMS Joint International Conference on Operational Research in Paris, France, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, July 1988.

[5] I. Adler, M. de Carvalho, M. G. C. Resende, and G. Veiga. Computational performance of variants of Karmarkar's algorithm. Talk held at the ORSA/TIMS Joint National Meeting in St. Louis, USA, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, October 1987.

[6] I. Adler, M. de Carvalho, M. G. C. Resende, and G. Veiga. A Monte–Carlo study of variants of interior point algorithms. Technical Report, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, 1987.

[7] I. Adler, N. K. Karmarkar, M. G. C. Resende, and G. Veiga. Implementation of an interior point algorithm for linear programming. Technical Report, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, 1986.

[8] I. Adler, N. K. Karmarkar, M. G. C. Resende, and G. Veiga. Data structures and programming techniques for the implementation of Karmarkar's algorithm. *ORSA Journal on Computing*, 1:84–106, 1989.

[9] I. Adler, N. K. Karmarkar, M. G. C. Resende, and G. Veiga. An implementation of Karmarkar's algorithm for linear programming. *Mathematical Programming*, 44:297–335, 1989. Errata in *Mathematical Programming*, 50:415, 1991.

[10] I. Adler, N. K. Karmarkar, and G. Veiga. Implementing an interior point algorithm for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Miami Beach, FL, USA, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, October 1986.

[11] I. Adler and R. D. C. Monteiro. A geometric view of parametric linear programming. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, January 1990.

[12] I. Adler and R. D. C. Monteiro. Limiting behavior of the affine scaling continuous trajectories for linear programming problems. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 189–211. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[13] I. Adler and R. D. C. Monteiro. An interior point algorithm applied to a class of convex separable programming problems. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, May 1991.

[14] I. Adler and R. D. C. Monteiro. Limiting behavior of the affine scaling continuous trajectories for linear programming problems. *Mathematical Programming*, 50:29–51, 1991.

[15] I. Adler and G. Veiga. On implementing interior point methods for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Los Angeles, CA, USA, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, April 1986.

[16] M. Akguel. On the exact solution of a system of linear homogeneous equations via a projective algorithm. *Arabian Journal for Science and Engineering*, 15(4):753–754, 1990.

[17] M. Akguel. A short proof of Karmarkar's main result. *Doga Tuerk Matematik Dergisi (= Turkish Journal of Mathematics, Ankara)*, 14:48–55, 1990.

[18] J. Andersen, R. Levkovitz, G. Mitra, and M. Tamiz. Adopting interior search algorithms for the solution of LPs for serial, coarse grain parallel and massively parallel computers. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Dept. of Mathematics and Statistics, Brunel University, Uxbridge, Middlesex UB8 3PH, UK, January 1990.

[19] J. Andersen and G. Mitra. Solving the Newton iteration step of the interior point method on massively parallel (SIMD) computer. Talk held at the Symposium APMOD '91—Applied Mathematical Programming and Modelling, Brunel University, London, UK, Dept. of Mathematics and Statistics, Brunel University, Uxbridge, Middlesex UB8 3PH, UK, January 1991.

[20] S. K. Andrusenko, E. A. Nurminskii, and P. I. Stetsyuk. Numerical experiments in a new class of algorithms in linear programming. *Zhurnal Vychislitel'noi Matematiki i Matematicheskoi Fiziki (Moscow)*, 27:349–356, 1987. Translated in : *USSR Computational Mathematics and Mathematical Physics*, 27(2):18–22, 1987.

[21] N. Angier. Folding the perfect corner. *Time Magazin*, 124:55, December 3 1984.

[22] K. M. Anstreicher. Analysis of a modified Karmarkar's algorithm for linear programming. Technical Report B#84, Yale School of Management, Yale University, New Haven, CT 06520, USA, August 1985.

[23] K. M. Anstreicher. Analysis of Karmarkar's algorithm for fractional linear programming. Technical Report, Yale School of Management, Yale University, New Haven, CT 06520, USA, November 1985.

[24] K. M. Anstreicher. A monotonic projective algorithm for fractional linear programming. *Algorithmica*, 1(4):483–498, 1986.

[25] K. M. Anstreicher. A strengthened acceptance criterion for approximate projections in Karmarkar's algorithm. *Operations Research Letters*, 5:211–214, 1986.

[26] K. M. Anstreicher. On the complexity of the projective algorithm for standard form linear programming. Technical Report, Yale School of Management, Yale University, New Haven, CT 06520, USA, 1987.

[27] K. M. Anstreicher. Linear programming and the Newton barrier flow. *Mathematical Programming*, 41:367–373, 1988.

[28] K. M. Anstreicher. A combined phase I – phase II projective algorithm for linear programming. *Mathematical Programming*, 43:209–223, 1989.

[29] K. M. Anstreicher. A combined phase I – phase II scaled potential algorithm for linear programming. CORE Discussion Paper 8939, Center for Operations Research and Econometrics, Universite Catholique de Louvain, B-1348 Louvain-la-Neuve, Belgium, 1989. To appear in *Mathematical Programming, Series B, 1991*.

[30] K. M. Anstreicher. Progress in interior point algorithms since 1984. *SIAM News*, 22:12–14, March 1989.

[31] K. M. Anstreicher. Recent developments in algorithms for linear programming. Talk held at the Third SIAM Conference on Optimization in Boston, MA, USA, Yale School of Management, Yale University, New Haven, CT 06520, USA, April 1989.

[32] K. M. Anstreicher. The worst–case step in Karmarkar's algorithm. *Mathematics of Operations Research*, 14:294–302, 1989.

[33] K. M. Anstreicher. Dual ellipsoids and degeneracy in the projective algorithm for linear programming. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 141–149. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[34] K. M. Anstreicher. On long step path following and SUMT for linear and quadratic programming. Technical Report, Yale School of Management, Yale University, New Haven, CT 06520, USA, August 1990.

[35] K. M. Anstreicher. A standard form variant and safeguarded linesearch for the modified Karmarkar algorithm. *Mathematical Programming*, 47:337–351, 1990.

[36] K. M. Anstreicher. Strict monotonicity and improved complexity in the standard form projective algorithm for linear programming. CORE Discussion Paper 9035, Center for Operations Research and Econometrics, Universite Catholique de Louvain, B-1348 Louvain-la-Neuve, Belgium, 1990.

[37] K. M. Anstreicher. Advances in interior point methods for linear programming. Tutorial held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, November 1991.

[38] K. M. Anstreicher. On interior algorithms for linear programming with no regularity assumptions. Technical Report, Yale School of Management, Yale University, New Haven, CT 06520, USA, 1991.

[39] K. M. Anstreicher. On monotonicity in the scaled potential algorithm for linear programming. *Linear Algebra and Its Applications*, 152:223–232, 1991.

[40] K. M. Anstreicher. On the performance of Karmarkar's algorithm over a sequence of iterations. *SIAM Journal on Computing*, 1(1):22–29, 1991.

[41] K. M. Anstreicher and R. A. Bosch. Long steps in a $O(n^3L)$ algorithm for linear programming. Technical Report, Yale School of Management, Yale University, New Haven, CT 06520, USA, 1988.

[42] K. M. Anstreicher and R. A. Bosch. On partial updating in a potential reduction linear programming algorithm of Kojima, Mizuno and Yoshise. Technical Report, Yale School of Management, Yale University, New Haven, CT 06520, USA, 1991.

[43] K. M. Anstreicher, D. den Hertog, C. Roos, and T. Terlaky. A long step barrier method for convex quadratic programming. Technical Report 90–53, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1990.

[44] K. M. Anstreicher and P. Watteyne. A family of search directions for Karmarkar's algorithm. CORE Discussion Paper 9030, Center for Operations Research and Econometrics, Universite Catholique de Louvain, B-1348 Louvain-la-Neuve, Belgium, 1990.

[45] A. Armacost and S. Mehrotra. A computational comparison of the network simplex method with the dual affine scaling method. *Journal of the Operational Research Society of India (Opsearch)*, 28(1):18–35, 1991.

[46] J. Aronson, R. Barr, R. Helgason, J. Kennington, A. Loh, and H. Zaki. The projective transformation algorithm by Karmarkar : A computational experiment with assignment problems. Technical Report 85–OR–3, Dept. of Operations Research, Southern Methodist University, Dallas, TX 75275, USA, August 1985.

[47] J. Aronson, R. Barr, R. Helgason, J. Kennington, A. Loh, and H. Zaki. A specialization of Karmarkar's algorithm to solve network problems. Technical Report, Dept. of Operations Research, Southern Methodist University, Dallas, TX 75275, USA, 1985.

[48] M. D. Asic and V. V. Kovacevic-Vujcic. An interior semi–infinite programming method. *Journal of Optimization Theory and Applications*, 59:369–390, 1988.

[49] M. D. Asic, V. V. Kovacevic-Vujcic, and M. D. Radosavljevic-Nikolic. Karmarkar algoritam : Analiza numericke stabilnosti i neke modifikacije. In *Proceedings of the 12th Yugoslav Symposium on Operations Research, Herceg–Novi, Yugoslavia, October 1985*, pages 33–41. 1985. (In Yugoslav).

[50] M. D. Asic, V. V. Kovacevic-Vujcic, and M. D. Radosavljevic-Nikolic. Asimptotsko ponasanje Karmarkarove metode. In *Proceedings of the 13th Yugoslav Symposium on Operations Research, Herceg–Novi, Yugoslavia, October 1986*, pages 81–88. 1986. (In Yugoslav).

[51] M. D. Asic, V. V. Kovacevic-Vujcic, and M. D. Radosavljevic-Nikolic. Asymptotic behavior and numerical stability of Karmarkar's method for linear programming. Technical Report, University of Belgrade, Belgrade, Yugoslavia, 1986.

[52] M. D. Asic, V. V. Kovacevic-Vujcic, and M. D. Radosavljevic-Nikolic. Behavior of Karmarkar's method on degenerate problems. Technical Report, Dept. of Mathematics, Michigan State University, East Lansing, MI 48824, USA, 1988.

[53] M. D. Asic, V. V. Kovacevic-Vujcic, and M. D. Radosavljevic-Nikolic. Asymptotic behavior of Karmarkar's method for linear programming. *Mathematical Programming*, 46:173–190, 1990.

[54] M. D. Asic, V. V. Kovacevic-Vujcic, and M. D. Radosavljevic-Nikolic. A note on limiting behavior of the projective and the affine rescaling

algorithms. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 151–157. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[55] The AT & T KORBX Linear Programming System, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, 1988. Introduced at the ORSA/TIMS Joint National Meeting in Denver, CO, USA, October 1988.

[56] R. Bach. Über die Effizienz eines polynomialen Verfahrens zur Lösung von linearen Optimierungsproblemen. (About the efficiency of a polynomial method for solving linear programming problems). Master's thesis, Fachbereich Wirtschaftswissenschaften und Operations Research, FernUniversität Hagen, P. O. Box 940, D-5800 Hagen, Germany, December 1990. (In German).

[57] A. Bagchi and B. Kalantari. A method for computing approximate solution of the trust region problem with application to projective methods for quadratic programming. Working Paper, Dept. of Computer Science, Rutgers University, New Brunswick, NJ 08903, USA, 1988.

[58] C. Ballintijn. Implementation aspects and performance results of the dual–affine algorithm. Talk held at the 14th Conference on the Mathematics of Operations Research in Dalfsen, The Netherlands, Shell Research Center (KSLA), Amsterdam, The Netherlands, January 1990.

[59] J. Barle and J. Grad. The implementation of Karmarkar's algorithm using electronic spreadsheet. Talk held at the DGOR–Jahrestagung in Berlin, Germany, Ekonomska Fakulteta Borisa Kidrica, University of Ljubljana, YU-61109 Ljubljana, Yugoslavia, September 1988.

[60] J. Barle and J. Grad. The implementations of interior point methods for solving LP on PC. Talk held at the DGOR–Jahrestagung in Vienna, Austria, Ekonomska Fakulteta Borisa Kidrica, University of Ljubljana, YU-61109 Ljubljana, Yugoslavia, August 1990.

[61] E. R. Barnes. A sparse matrix version of Karmarkar's algorithm. Technical Report, Dept. of Mathematical Sciences, IBM T. J. Watson Research Center, P. O. Box 218, Yorktown Heights, NY 10598, USA, 1986.

[62] E. R. Barnes. A variation on Karmarkar's algorithm for solving linear programming problems. *Mathematical Programming*, 36:174–182, 1986.

[63] E. R. Barnes. A polynomial–time version of the affine scaling algorithm. Talk held at the ORSA/TIMS Joint National Meeting in St. Louis, USA, Dept. of Mathematical Sciences, IBM T. J. Watson Research Center, P. O. Box 218, Yorktown Heights, NY 10598, USA, October 1987.

[64] E. R. Barnes. Phase–I procedures for interior point problems. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, Dept. of Mathematical Sciences, IBM T. J. Watson Research Center, P. O. Box 218, Yorktown Heights, NY 10598, USA, April 1988.

[65] E. R. Barnes. The role of centering in interior point methods. Technical Report, Dept. of Mathematical Sciences, IBM T. J. Watson Research Center, P. O. Box 218, Yorktown Heights, NY 10598, USA, 1988.

[66] E. R. Barnes. Computing centers and minimum covering ellipsoids for polytopes. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA 30322-0205, USA, October 1989.

[67] E. R. Barnes. Numerical techniques for interior point methods. Technical Report, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA 30322-0205, USA, 1989.

[68] E. R. Barnes. Some results concerning convergence of the affine scaling algorithm. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 131–139. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[69] E. R. Barnes. Minimum containing ellipsoids and regular polyhedra. *COAL Newsletter*, 19:2–6, August 1991.

[70] E. R. Barnes, S. Chopra, and D. J. Jensen. Polynomial–time convergence of the affine scaling algorithm with centering. Talk held at the Conference on Progress in Mathematical Programming, Asimolar Conference Center, Pacific Grove, CA, USA, Dept. of Mathematical Sciences, IBM T. J. Watson Research Center, P. O. Box 218, Yorktown Heights, NY 10598, USA, March 1987.

[71] E. R. Barnes, S. Chopra, and D. J. Jensen. The affine scaling method with centering. Technical Report, Dept. of Mathematical Sciences, IBM T. J. Watson Research Center, P. O. Box 218, Yorktown Heights, NY 10598, USA, 1988.

[72] E. R. Barnes, S. Chopra, and D. J. Jensen. A polynomial–time version of the affine–scaling algorithm. Working Paper Series 88–101, Graduate School of Business and Administration, New York University, New York, NY 10006, USA, 1988.

[73] E. R. Barnes and D. J. Jensen. Affine–scaling algorithms for linear programming with centering steps. Technical Report, Dept. of Mathematical Sciences, IBM T. J. Watson Research Center, P. O. Box 218, Yorktown Heights, NY 10598, USA, 1987.

[74] E. R. Barnes and A. Moretti. On the convergence of the affine scaling algorithm. Technical Report, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0205, USA, 1991.

[75] J. F. Barutt, J. A. Ludvijsen, and E. M. Olsen. Using the interior point method for solving large scale crew scheduling problems. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Northwest Airlines F-7140, MSP International Airport, St. Paul, MN 55111, USA, May 1990.

[76] D. A. Bayer, N. K. Karmarkar, and J. C. Lagarias. Methods and apparatus for optimization system operational parameters. U. S. Patent No. 4.744.027, 1988. AT & T Bell Laboratories, Murray Hill, NJ 07974, USA.

[77] D. A. Bayer and J. C. Lagarias. The nonlinear geometry of linear programming, Part I : Affine and projective scaling trajectories. *Transactions of the American Mathematical Society*, 314(2):499–526, 1989.

[78] D. A. Bayer and J. C. Lagarias. The nonlinear geometry of linear programming, Part II : Legendre transform coordinates. *Transactions of the American Mathematical Society*, 314(2):527–581, 1989.

[79] D. A. Bayer and J. C. Lagarias. Karmarkar's linear programming algorithm and Newton's method. *Mathematical Programming*, 50:291–330, 1991.

[80] M. S. Bazaraa, J. J. Jarvis, and H. F. Sherali. *Linear Programming and Network Flows*, chapter 8.4 : Karmarkar's projective algorithm, pages 380–394, chapter 8.5 : Analysis of Karmarkar's algorithm, pages 394–418. John Wiley & Sons, New York, NY, USA, second edition, 1990.

[81] E. P. Beisel and M. Mendel. *Optimierungsmethoden des Operations Research, Band 1 (Optimization Methods of Operations Research, Vol. 1)*, chapter 11 : Die Projektionsmethode von Karmarkar (The projection

method of Karmarkar), pages 169–187. Vieweg Verlag, Braunschweig, Germany, 1987. (In German).

[82] M. Ben–Daya and C. M. Shetty. Polynomial barrier function algorithm for linear programming. Technical Report J 88–4, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA 30322-0205, USA, 1988.

[83] M. Ben–Daya and C. M. Shetty. Polynomial barrier function algorithm for convex quadratic programming. *Arabian Journal for Science and Engineering*, 15(4):657–670, 1990.

[84] J. Benjamin and M. Dialsy. Some applications of the primal–dual interior point algorithm using GAUSS programming language. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Economics Department, North Carolina A & T State University, Greensboro, NC 27411, USA, October 1990.

[85] D. P. Bertsekas. Projected Newton methods for optimization problems with simple constraints. *SIAM Journal on Control and Optimization*, 20:221–246, 1982.

[86] U. Betke and P. Gritzmann. Projection algorithms for linear programming. Technical Report, University of Siegen, Hölderlinstr. 3, D-5900 Siegen, Germany, 1986.

[87] J. R. Birge and R. M. Freund. Prior reduced fill-in in solving equations in interior point algorithm. Working Paper OR 3186–90–MS, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, 1990.

[88] J. R. Birge and D. Holmes. Using interior point methods for stochastic linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Dept. of Operations Research, University of Michigan, Ann Arbor, MI 48103, USA, November 1991.

[89] J. R. Birge and L. Qi. Solving stochastic linear programs via a variant of Karmarkar's algorithm. Technical Report 85–12, Dept. of Operations Research, University of Michigan, Ann Arbor, MI 48103, USA, 1985.

[90] J. R. Birge and L. Qi. Computing block–angular Karmarkar projections with applications to stochastic programming. *Management Science*, 34:1472–1479, 1988.

[91] J. R. Birge and C. Rosa. A simplified proof of the general convergence of affine scaling. Technical Report 91–7, Dept. of Operations Research, University of Michigan, Ann Arbor, MI 48103, USA, 1991.

[92] R. E. Bixby, J. W. Gregory, I. J. Lustig, R. E. Marsten, and D. F. Shanno. Very large–scale linear programming : A case study in combining interior point and simplex methods. Technical Report J–91–07, School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA 30332, USA, May 1991. Technical Report SOR 91–08, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, May 1991. Technical Report RRR 34–91, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, 1991.

[93] C. E. Blair. The iterative step in the linear programming algorithm of N. Karmarkar. *Algorithmica*, 1(4):537–539, 1986.

[94] C. E. Blair. Karmarkar's algorithm and the simplex algorithm. Technical Report, College of Commerce and Business Administration, University of Illinois at Urbana–Champaign, Urbana, IL 61820, USA, 1989.

[95] A. M. Bloch. Steepest descent, linear programming, and Hamiltonian flows. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 77–88. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[96] L. Blum. Towards an asymptotic analysis of Karmarkar's algorithm. *Information Processing Letters*, 23:189–194, 1986.

[97] L. Blum. A new simple homotopy algorithm for linear programming I. *Journal of Complexity*, 4:124–136, 1988.

[98] P. T. Boggs. Comparing algorithms is not an easy task. *SIAM News*, 19(1):7, 1986.

[99] P. T. Boggs. Higher–order methods for large linear and quadratic programming problems. Talk held at the Second International Conference on Industrial and Applied Mathematics (ICIAM '91), Washington, DC, USA, United States Department of Commerce, National Institute of Standards and Technology, Center for Applied Mathematics, Gaithersburg, MD 20899, USA, July 1991.

[100] P. T. Boggs, P. D. Domich, J. R. Donaldson, and C. Witzgall. Algorithmic enhancements to the method of center for linear programming. *ORSA Journal on Computing*, 1:159–171, 1989.

[101] P. T. Boggs, P. D. Domich, J. E. Rogers, and C. Witzgall. An interior–point method for linear and quadratic programming problems. *COAL Newsletter*, 19:32–40, August 1991.

[102] P. T. Boggs, P. D. Domich, and C. Witzgall. On center trajectories for linear programming. Technical Report, United States Department of Commerce, National Institute of Standards and Technology, Center for Applied Mathematics, Gaithersburg, MD 20899, USA, 1988.

[103] B. Borchers and J. E. Mitchell. Using an interior point method in a branch and bound algorithm for integer programming. RPI Mathematical Report 195, Dept. of Mathematical Sciences, Rensselaer Polytechnic Institute, Troy, NY 12180-3590, USA, 1991.

[104] R. Bosch and K. M. Anstreicher. A partial updating algorithm for linear programs with many variables and few constraints. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Dept. of Mathematics, Oberlin College, Oberlin, OH 44074, USA, November 1991.

[105] M. J. Box, D. Davies, and W. H. Swann. *Nonlinear Optimization Technique*, volume 5 of *ICI Monograph of Mathematics and Statistics*. Oliver and Boyd Ltd., London, UK, 1969.

[106] L. M. Bregman. A polynomial–time simplex type method for solving linear systems of inequalities. *Kibernetika (Kiev)*, 26(1):84–87, 1990. Translated in : *Cybernetics (USA)*, 26(1):106–110, 1990.

[107] J. F. Brophy and P. W. Smith. Prototyping Karmarkar's algorithm using MATH/PROTRAN. *International Mathematical and Statistical Libraries (IMSL) Directions*, 5:2–3, 1988.

[108] G. G. Brown, R. D. McBride, and K. R. Wood. Computational methods in the projective linear programming algorithm. Talk held at the ORSA/TIMS Joint National Meeting in Atlanta, GA, USA, Dept. of Operations Research, Naval Postgraduate School, Monterey, CA 93943, USA, November 1985.

[109] G. W. Brown and T. C. Koopmans. Computational suggestions for maximizing a linear function subject to linear inequalities. In T. C. Koopmans, editor, *Activity Analysis of Production and Allocation*, pages 377–380. John Wiley & Sons, New York, NY, USA, 1951.

[110] W. Carolan, J. Hill, J. Kennington, S. Niemi, and S. Wichmann. An empirical evaluation of the KORBX algorithms for military airlift applications. *Operations Research*, 38:240–248, 1990.

[111] C. W. Caroll. The created response surface technique for optimizing nonlinear restrained systems. *Operations Research*, 9(2):169–184, 1961.

[112] T. J. Carpenter, I. J. Lustig, J. M. Mulvey, and D. F. Shanno. Higher order predictor–corrector interior point methods with application to quadratic objectives. RUTCOR Research Report RRR 67–90, RUTCOR – Rutgers Center for Operations Research, Hill Center for Mathematical Sciences, New Brunswick, NJ 08903, USA, 1990. Technical Report SOR 90–09, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, November 1990.

[113] T. J. Carpenter, I. J. Lustig, J. M. Mulvey, and D. F. Shanno. A primal–dual interior point method for convex separable nonlinear programs. RUTCOR Research Report RRR 25–90, RUTCOR – Rutgers Center for Operations Research, Hill Center for Mathematical Sciences, New Brunswick, NJ 08903, USA, May 1990. Technical Report SOR 90–02, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, 1990.

[114] T. M. Cavalier and T. C. Schall. Implementing a projective algorithm for solving inequality constrained linear programs. IMSE Working Paper 86–128, Dept. of Industrial and Management Systems Engineering, Pennsylvania State University, University Park, PA 16802, USA, 1986.

[115] T. M. Cavalier and T. C. Schall. Implementing an affine scaling algorithm for linear programming. *Computers and Operations Research*, 14:341–347, 1987.

[116] T. M. Cavalier and A. L. Soyster. Some computational experience and a modification of the Karmarkar algorithm. Working Paper 85–105, Dept. of Industrial and Management Systems Engineering, Pennsylvania State University, University Park, PA 16802, USA, 1985.

[117] Y. Censor and A. Lunt. Optimization on '*log x*' entropy over linear inequality constraints. *SIAM Journal on Control and Optimization*, 25:921–933, 1987.

[118] V. Chandru. Notes on Karmarkar's new algorithm for linear programming. Unpublished Memorandum, Dept. of Industrial Engineering, Purdue University, West Lafayette, IN 47907, USA, 1984.

[119] V. Chandru and B. Kochar. A class of algorithms for linear programming. Research Memorandum 85–14, Dept. of Industrial Engineering, Purdue University, West Lafayette, IN 47907, USA, 1985. Revised 1986.

[120] V. Chandru and B. Kochar. Exploiting special structures using a variant of Karmarkar's algorithm. Research Memorandum 86–10, Dept. of Industrial Engineering, Purdue University, West Lafayette, IN 47907, USA, 1986.

[121] S. Y. Chang and K. G. Murty. The steepest descent gravitational method for linear programming. *Discrete Applied Mathematics*, 25:211–239, 1989.

[122] A. Charnes, T. Song, and M. Wolfe. An explicit solution sequence and convergence of Karmarkar's algorithm. Research Report CCS 501, Center for Cybernetic Studies, University of Texas, Austin, TX 78712-1177, USA, 1984.

[123] S. Chen. Computational experience with the Karmarkar algorithm. Talk held at the ORSA/TIMS Joint National Meeting in Los Angeles, CA, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, April 1986.

[124] S. Chen and D. N. Lee. Supercomputers and an efficient implementation of Karmarkar's algorithm. Talk held at the SIAM National Meeting on Numerical Analysis in Denver, CO, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, 1987.

[125] Y. C. Cheng, D. J. Houck, E. Housos, C. Huang, M. S. Meketon, L. Slutsman, R. Vanderbei, and P. Wang. The AT & T KORBX Linear Programming System : System architecture and performance. Talk held at the 13th International Symposium on Mathematical Programming in Tokyo, Japan, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, August 1988.

[126] Y. C. Cheng, D. J. Houck, J. M. Liu, M. S. Meketon, L. Slutsman, R. J. Vanderbei, and P. Wang. The AT & T KORBX System. *AT & T Technical Journal*, 68:7–19, 1989.

[127] Y. C. Cheng, J. M. Liu, M. Meketon, P. Wang, R. Vanderbei, and L. Slutsman. Linear programming algorithms implemented on the AT & T KORBX System. Talk held at the ORSA/TIMS Joint National Meeting in Denver, CO, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, October 1988.

[128] Y. C. Cheng and K. T. Medhi. The AT & T KORBX Linear Programming System : Preconditioned conjugate gradient implementation. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, October 1989.

[129] M. J. Chifflet, A. Lisser, D. Tachat, and P. Tolla. Computing block–angular Karmarkar projections with applications to multicommodity flow problems. Talk held at the 12th Triennial Conference on Operations Research in Athens, Greece, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, June 1990.

[130] J. J. Chiment. Complexity issues for numerical optimization. *SIAM News*, 24(3):24–25, May 1991.

[131] S. S. Chiu and Y. Ye. Recovering the shadow price in projection methods for linear programming. Technical Report, Engineering Economic Systems Department, Stanford University, Stanford, CA 94305, USA, 1985.

[132] S. S. Chiu and Y. Ye. Simplex method and Karmarkar's algorithm : A unifying structure. Technical Report, Engineering Economic Systems Department, Stanford University, Stanford, CA 94305, USA, 1985/86.

[133] I. C. Choi and D. Goldfarb. Interior point methods for solving structured linear programs using parallel computation. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, October 1989.

[134] I. C. Choi and D. Goldfarb. Detecting optimal basic and nonbasic variables prior to optimality in interior point methods. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, May 1990.

[135] I. C. Choi and D. Goldfarb. Solving multicommodity network flow problems by an interior point method. In T. F. Coleman and Y. Li, editors, *Large–Scale Numerical Optimization, Papers from the Workshop held at Cornell University, Ithaca, NY, USA, October 1989*, volume 46 of *SIAM Proceedings in Applied Mathematics*, pages 58–69. Society of Industrial and Applied Mathematics (SIAM), Philadelphia, PA, USA, 1990.

[136] I. C. Choi, C. L. Monma, and D. F. Shanno. Computational experience with a primal–dual interior point method for linear programming. Technical Report, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, 1989.

[137] I. C. Choi, C. L. Monma, and D. F. Shanno. Further development of a primal–dual interior point method. *ORSA Journal on Computing*, 2:304–311, 1990.

[138] E. Christiansen and K. O. Kortanek. Computing material collapse displacement fields on a Cray X–MP/48 by the LP primal affine scaling algorithm. *Annals of Operations Research*, 22:355–376, 1990.

[139] E. Christiansen and K. O. Kortanek. Computation of the collapse state in limit analysis using the LP primal affine scaling algorithm. *Journal of Computational and Applied Mathematics*, 34:47–63, 1991.

[140] S. C. K. Chu. On the existence of positive non–extreme point solutions of linear programming. *International Journal of Mathematical Education in Science and Technology*, 21:99–103, 1990.

[141] C. E. Clark and J. L. Strand. Application of the Karmarkar algorithm and expert system technology to transmission network planning. *GLOBECOM Tokyo '87 : Conference Record of the IEEE/IEICE Global Telecommunications Conference in Tokyo*, 2:270, 1987.

[142] J. Clausen and F. A. Al–Khayyal. *Interior Point Methods*, volume 19 of *COAL Newsletter*. Mathematical Programming Society, August 1991.

[143] T. Coleman and Y. Li. Quadratic interior point algorithms for piecewise linear problems. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, October 1989.

[144] T. F. Coleman and Y. Li. *Large–Scale Optimization, Papers from the Workshop held at Cornell University, Ithaca, NY, USA, October 1989*, volume 46 of *SIAM Proceedings in Applied Mathematics*. Society of Industrial and Applied Mathematics (SIAM), Philadelphia, PA, USA, 1990.

[145] O. Colmenares. Karmarkar's linear programming algorithm : Better or worse than the classical method ? Technical Report, Graduate School of Management, University of California at Los Angeles, Los Angeles, CA, USA, January 1985.

[146] R. Conway and M. Magazine. A case against software patents. *OR/MS Today*, 18(1):14–15, February 1991.

[147] T. M. Cook and R. A. Russell. *Introduction to Management Science*, chapter 4 : An alternative to the simplex method — Karmarkar's algorithm, pages 137–139. Prentice Hall, Englewood Cliffs, NJ 07632, USA, fourth edition, 1989.

[148] P. Cremonese. Programmazione lineare e algoritmo proiettivo. Implementazione, experienze, relazione col simplesso (Linear Programming

and Projective Algorithm. Implementation, experiences, Simplex Relation). *Ricerca Operativa (Italy)*, 18:73–102, 1988. (In Italian).

[149] G. B. Dantzig. Dikin's interior method for LP. Manuscript, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, 1988.

[150] G. B. Dantzig, D. Goldfarb, E. Lawler, C. Monma, and S. M. Robinson. Report of the Committee on Algorithms and the Law. *Optima (The Mathematical Programming Society Newsletter)*, 33:2–19, June 1991. Containing : B. Kahin, The case against "software patents", Appendix A, pages 5–13, and The League for Programming Freedom, Against software patents, Appendix B, pages 14–19.

[151] G. B. Dantzig, D. Goldfarb, E. Lawler, C. Monma, and S. M. Robinson. Report of the MPS Committee on Algorithms and the Law. *SIAM News*, 24(6):3, 18, November 1991.

[152] G. B. Dantzig and Y. Ye. A build–up interior method for linear programming : Affine scaling form. Technical Report SOL 90–4, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, February 1990.

[153] G. B. Dantzig and Y. Ye. A build–up interior method for linear programming : Affine scaling form. Technical Report, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, July 1991.

[154] David II Report. Renewing U.S. mathematics — A plan for the 1990s, Section 24 : Interior point methods for linear programming. *Notices of the American Mathematical Society*, 37(8):984–1004, esp. 1001–1002, October 1990.

[155] J. Dennis, A. M. Morshedi, and K. Turner. A variable metric variant of the Karmarkar algorithm for linear programming. *Mathematical Programming*, 39:1–20, 1987.

[156] U. Derigs. Neuere Ansätze in der Linearen Optimierung—Motivation, Konzepte und Verfahren (Recent results in linear programming—motivation, concepts and methods). In L. Streitfeldt, H. Hauptmann, A. W. Marusev, D. Ohse, and U. Pape, editors, *Operations Research Proceedings 1985*, pages 47–58, Springer-Verlag, Berlin, Germany, 1986. (In German).

[157] Z. Y. Diao. Karmarkar's algorithm and its modification. *Chinese Journal on Operations Research*, 7(1):73–75, 1988.

[158] Z. Y. Diao. A remark on Karmarkar's algorithm. *Chinese Journal on Operations Research*, 7(2):61–62, 1988.

[159] G. T. Didderich. Some remarks on Karmarkar's potential function. *Aequationes Mathematicae*, 36:57–75, 1988.

[160] I. I. Dikin. Iterative solution of problems of linear and quadratic programming. *Doklady Akademii Nauk SSSR*, 174:747–748, 1967. Translated in : *Soviet Mathematics Doklady*, 8:674–675, 1967.

[161] I. I. Dikin. On the convergence of an iterative process. *Upravlyaemye Sistemi*, 12:54–60, 1974. (In Russian).

[162] I. I. Dikin. Letter to the editor. *Mathematical Programming*, 41:393–394, 1988.

[163] J. Ding and T. Y. Li. An algorithm based on weighted logarithmic barrier functions for linear complementarity problems. *Arabian Journal for Science and Engineering*, 15(4):769–685, 1990.

[164] J. Ding and T. Y. Li. A polynomial–time predictor–corrector algorithm for a class of linear complementarity problems. *SIAM Journal on Computing*, 1(1):83–92, 1991.

[165] J. Dinn. A new polynomial–time algorithm for linear programming. Technical Report, Dept. of Mathematics, Michigan State University, East Lansing, MI 48824, USA, 1988.

[166] N. F. Dinn, N. K. Karmarkar, and L. P. Sinha. Karmarkar algorithm enables interactive planning of networks. *Record AT & T Bell Laboratories*, 64(2):11–13, 1986.

[167] M. H. Dodani and A. J. G. Babu. Karmarkar's projective method for linear programming : A computational survey. *Computers and Industrial Engineering*, 13:285–289, 1987.

[168] M. H. Dodani and A. J. G. Babu. Karmarkar's projective method for linear programming : A computational appraisal. *Computers and Industrial Engineering*, 16:198–206, 1989.

[169] M. H. Dodani and A. J. G. Babu. Karmarkar's projective method for linear programming : A computational survey. *International Journal of Mathematical Education in Science and Technology*, 21:191–212, 1990.

[170] S. Dolecki. *Optimization : Proceedings of the 5th French–German Conference in Castel–Novel, Varetz, France, October 1988*, volume 1405 of *Lecture Notes in Mathematics*. Springer-Verlag, Berlin, Germany, 1989.

[171] P. D. Domich, P. T. Boggs, J. R. Donaldson, and C. Witzgall. Optimal 3–dimensional methods for linear programming. Technical Report NISTIR 89–4225, United States Department of Commerce, National Institute of Standards and Technology, Gaithersburg, MD 20899, USA, December 1989.

[172] P. D. Domich, P. T. Boggs, J. R. Donaldson, and C. Witzgall. Third order correction methods to the method of centers for linear programming problems. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, United States Department of Commerce, National Institute of Standards and Technology, Applied and Computational Mathematics Division, Boulder, CO 80303, USA, May 1990.

[173] P. D. Domich, P. T. Boggs, J. R. Donaldson, and C. Witzgall. An interior point approach for linear and quadratic programming. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, United States Department of Commerce, National Institute of Standards and Technology, Applied and Computational Mathematics Division, Boulder, CO 80303, USA, November 1991.

[174] P. D. Domich, P. T. Boggs, J. E. Rogers, and C. Witzgall. Optimizing over 3–d subspaces in an interior point method. *Linear Algebra and Its Applications*, 152:315–342, 1991.

[175] T. Doup, R. Bisseling, and L. Loyens. A parallel interior point algorithm for linear programming on a network of 400 transputers. Talk held at the Symposium APMOD '91—Applied Mathematical Programming and Modelling, Brunel University, London, UK, Shell Research Center (KSLA), Amsterdam, The Netherlands, January 1991.

[176] M. L. Dowling. Comparing the affine and projective vector fields associated with linear programming. Technical Report, Dept. of Management, University of Georgia, Athens, GA 30602, USA, 1989. Submitted to *Mathematical Programming*.

[177] D. Z. Du, F. Wu, and X. S. Zhang. Why is the objective function nonlinearized in the interior point methods for nonlinear programming? *Mathematics in Practice and Theory*, 2:63–68, 1990. (In Chinese).

[178] I. S. Duff. The solution of large–scale least–squares problems on supercomputers. *Annals of Operations Research*, 22:241–252, 1990.

[179] Not so simplex. *The Economist*, December 1 1984.

[180] C. Edirisinghe and W. Ziemba. A boundary point algorithm for linear programming. Talk held at the ORSA/TIMS Joint National Meeting

in Anaheim, CA, USA, Dept. of Commerce and Business Administration, University of British Columbia, Vancouver, BC V6T 1Y8, Canada, November 1991.

[181] A. S. El-Bakry, R. A. Tapia, and Y. Zhang. A study of indicators for identifying zero variables in interior–point methods. Technical Report TR–91–15, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, 1991.

[182] A. Emmett. Karmarkar's algorithm : A threat to simplex ? *IEEE Spectrum*, pages 54–55, December 1985.

[183] T. J. Encheva. Computational comparisons for the method of centers of gravity of vertices. *Serdica (Bulgaricae Mathematicae Publicationes)*, 16(3):188–193, 1990.

[184] J. R. Eriksson. Algorithms for entropy and mathematical programming. Linköping Studies in Science and Technology Dissertations 63, Dept. of Mathematics, Linköping University, S-58183 Linköping, Sweden, 1981.

[185] J. R. Eriksson. An iterative primal–dual algorithm for linear programming. Technical Report LiTH–MAT–R–1985–10, Dept. of Mathematics, Linköping University, S-58183 Linköping, Sweden, 1985.

[186] J. R. Eriksson. Using the entropy function to get an interior point method for linear programming. Technical Report LiTH–MAT–R–1990–02, Dept. of Mathematics, Linköping University, S-58183 Linköping, Sweden, 1990.

[187] S. C. Fang. A new unconstrained convex programming approach to linear programming. OR Research Report 243, Operations Research Program, North Carolina State University, Raleigh, NC 27695, USA, 1990. To appear in *Zeitschrift für Operations Research—Methods and Models of Operations Research* 36(2), 1992.

[188] S. C. Fang, S. C. Puthenpura, R. Saigal, and P. Sinha. Stochastic linear programming via affine scaling and Kalman. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Operations Research Program, North Carolina State University, Raleigh, NC 27695, USA, November 1991.

[189] W. Fang and W. Shi-Quan. New algorithms for linear programming. Technical Report, Institute of Applied Mathematics, Academia Sinica, Beijing, People Republic of China, 19..(?).

[190] J. J. Farrell. Recent advances in linear programming applied to global defense. *Proceedings of the 27th IEEE Conference on Decision and Control, Austin, TX, USA*, pages 242–243, December 1988.

[191] A. Fask and W. F. Walker. A polynomial–time algorithm for solving transportation problems where the sources are bounded. Talk held at ORSA/TIMS Joint National Meeting in New Orleans, USA, Farleigh Dickinson University, Madison, NJ 07940, USA, May 1987.

[192] M. C. Ferris and A. B. Philpott. On the performance of Karmarkar's algorithm. *Journal of the Operational Research Society*, 39:257–270, 1988.

[193] M. C. Ferris and A. B. Philpott. An interior point algorithm for semi–infinite linear programming. *Mathematical Programming*, 43:257–276, 1989.

[194] A. V. Fiacco. Barrier methods in nonlinear programming. In A. Holzman, editor, *Operations Research Support Methodology*, pages 377–440. Marcel Dekker, New York, NY, USA, 1979.

[195] A. V. Fiacco. Perturbed variations of penalty function methods — example : Projective SUMT. *Annals of Operations Research*, 27:371–380, 1990.

[196] A. V. Fiacco and G. P. McCormick. *Nonlinear Programming : Sequential Unconstrained Minimization Techniques*. John Wiley & Sons, New York, NY, USA, 1968. Reprint : Volume 4 of *SIAM Classics in Applied Mathematics*, SIAM Publications, Philadelphia, PA 19104–2688, USA, 1990.

[197] R. Fletcher. *Practical Methods of Optimization*, chapter 8.7 : Polynomial time algorithms, pages 183–188. John Wiley & Sons, New York, NY, USA, second edition, 1987.

[198] R. Fletcher. Recent developments in linear and quadratic programming. In A. Iserles and M. J. D. Powell, editors, *The State–of–the–Art in Numerical Analysis*, pages 213–243, esp. 219–224. Oxford University Press, Oxford, UK, 1987.

[199] J. J. H. Forrest and J. A. Tomlin. Vector processing in simplex and interior methods for linear programming. *Annals of Operations Research*, 22:71–100, 1990.

[200] A. L. Forsgren and W. Murray. Newton methods for large–scale linear equality–constrained minimization. Technical Report SOL 90–6, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, 1990.

[201] R. Fourer and S. Mehrotra. Performance of an augmented system approach for solving least–squares problems in an interior–point method for linear programming. Technical Report (in preparation), Dept. of Industrial Engineering and Management Sciences, Northwestern University, Evanston, IL 60208, USA, 1991.

[202] R. Fourer and S. Mehrotra. Performance of an augmented system approach for solving least–squares problems in an interior–point method for linear programming. *COAL Newsletter*, 19:26–31, August 1991.

[203] C. Fraley. Linear updates for a single – phase projective method. *Operations Research Letters*, 9:169–174, 1990.

[204] C. Fraley and J. P. Vial. Numerical study of projective methods for linear programming. In S. Dolecki, editor, *Optimization : Proceedings of the 5th French–German Conference in Castel–Novel, Varetz, France, October 1988*, volume 1405 of *Lecture Notes in Mathematics*, pages 25–38. Springer-Verlag, Berlin, Germany, 1989.

[205] C. Fraley and J. P. Vial. Single – phase versus multiple – phase projective methods for linear programming. Technical Report, COMIN, University of Geneva, 2 Rue de Candolle, CH-1211 Geneva 4, Switzerland, 1989.

[206] J. Franklin. Convergence in Karmarkar's algorithm for linear programming. *SIAM Journal on Numerical Analysis*, 24:928–945, 1987.

[207] B. A. Freedman, S. C. Puthenpura, and L. P. Sinha. A new affine scaling based algorithm for optimizing convex, nonlinear functions with linear constraints. Technical Report, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, 1990.

[208] R. M. Freund. An analogous of Karmarkar's algorithm for inequality constrained linear programs, with a 'new' class of projective transformations for centering a polytope. *Operations Research Letters*, 7:9–13, 1988.

[209] R. M. Freund. A generalization/extension of Karmarkar's algorithm for inequality constrained linear programs based on projective centering of the polyhedra. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, April 1988.

[210] R. M. Freund. Projective transformations for finding the w–center of a polyhedra. Talk held at the ORSA/TIMS Joint National Meeting in Denver, CO, USA, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, October 1988.

[211] R. M. Freund. Projective transformations for interior point methods, Part I : Basic theory and linear programming. Working Paper 2049–88, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, October 1988.

[212] R. M. Freund. Projective transformations for interior point methods, Part II : Analysis of an algorithm for finding the weighted center of a polyhedral system. Working Paper 2050–88, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, October 1988.

[213] R. M. Freund. A potential–function reduction algorithm for solving a linear program directly from an infeasible 'warm start'. Working Paper 3079–89–MS, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, 1989. To appear in *Mathematical Programming, Series B, 1991*.

[214] R. M. Freund. Projective transformations for interior point algorithms, a superlinearly convergent algorithm for the w–center problem. Working Paper, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, 1989. To appear in *Mathematical Programming*.

[215] R. M. Freund. Interior point algorithms for solving a linear program directly from an infeasible 'warm start'. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, May 1990.

[216] R. M. Freund. Newton's method for general parametric center problems. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, October 1990.

[217] R. M. Freund. Recent results and perspectives on solving linear programming from an infeasible 'warm start'. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, July 1990.

[218] R. M. Freund. Theoretical efficiency of solving a linear program from an infeasible 'warm start'. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, January 1990.

[219] R. M. Freund. A combined phase I – phase II algorithm for LP based on the intuitive geometry of linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, November 1991.

[220] R. M. Freund. Interior–point methods for linear programming : A status report. Tutorial held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, May 1991.

[221] R. M. Freund. Polynomial–time algorithms for linear programming based only on primal scaling and projected gradients of a potential function. *Mathematical Programming*, 51:203–222, 1991.

[222] R. M. Freund. Theoretical efficiency of a shifted barrier function algorithm for linear programming. *Linear Algebra and Its Applications*, 152:19–41, 1991.

[223] R. M. Freund and K. C. Tan. A method for the parametric center problem, with a strictly monotone polynomial–time algorithm for linear programming. Working Paper 2100–89, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, 1989. Revised April 1990.

[224] R. M. Freund and K. C. Tan. A parametric center algorithm and a strictly monotonic central path algorithm for LP. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, October 1989.

[225] R. M. Freund and K. C. Tan. Newton's method for parametric center problems. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, July 1990.

[226] F. Fricker. Komplexe Optimierungsaufgaben schneller lösen (Solving complex optimization problems faster). *Frankfurter Allgemeine Zeitung, Sektion : Natur und Wissen*, March 27 1985. (In German).

[227] K. R. Frisch. Principles of linear programming—With a particular reference to the double gradient form of the logarithmic potential method. Memorandum, Institute of Economics, University of Oslo, Oslo, Norway, October 1954.

[228] K. R. Frisch. The logarithmic potential method for convex programming. Unpublished manuscript, Institute of Economics, University of Oslo, Oslo, Norway, May 1955.

[229] K. R. Frisch. Linear dependencies and a mechanized form of the multiplex method for linear programming. Memorandum, Institute of Economics, University of Oslo, Oslo, Norway, 1957.

[230] K. R. Frisch. The multiplex method for linear programming. *Sankhya*, 18:329–362, 1957.

[231] M. Fukushima, N. Arai, and T. Ibaraki. An interior method for nonlinear minimum cost network flow problems. *Systems and Control (Japan)*, 31(11):837–843, 1987.

[232] C. B. Garcia and F. J. Gould. An application of homotopy to solving linear programs. *Mathematical Programming*, 27:263–382, 1983.

[233] M. R. Garey and D. M. Gay. Letter from the AT & T Laboratories. *Mathematical Programming Society Committee on Algorithms (COAL) Newsletter*, December 1985.

[234] S. A. Garfunkel, L. A. Steen, and J. Malkevitch. *For All Practical Purposes : Introduction to Contemporary Mathematics*, chapter 4 : Linear programming : An alternative to the simplex method, pages 80–83, 362. W. H. Freeman and Company, New York, NY, USA, 1988.

[235] D. M. Gay. Sparse projections in Karmarkar's linear programming algorithm. Talk held at the ORSA/TIMS Joint National Meeting in Atlanta, GA, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, November 1985.

[236] D. M. Gay. Pictures of Karmarkar's linear programming algorithm. Computer Science Technical Report 136, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1987.

[237] D. M. Gay. A variant of Karmarkar's linear programming algorithm for problems in standard form. *Mathematical Programming*, 37:81–90, 1987. Errata in *Mathematical Programming*, 40:111, 1988.

[238] D. M. Gay. Massive memory buys little speed for complete, in–core sparse Cholesky factorizations on some scalar computers. *Linear Algebra and Its Applications*, 152:291–314, 1991.

[239] D. M. Gay. Stopping tests that compute optimal solutions for interior–point linear programming algorithms. In *Advances in Numerical Partial*

Differential Equations and Optimization, pages 17–42. SIAM Publications, Philadelphia, PA, USA, 1991.

[240] D. M. Gay, N. K. Karmarkar, and K. G. Ramakrishnan. The Karmarkar algorithm : Adding wings to linear programming. *Record AT & T Bell Laboratories*, 64(2):4–10, 1986.

[241] D. M. Gay, M. Kojima, and R. A. Tapia. *Interior Point Methods for Linear Programming*, volume 152 of *Linear Algebra and Its Applications*. North Holland, Amsterdam, The Netherlands, July 1991.

[242] B. R. Gelbaum. *Linear Algebra : Basics, Practice and Theory*, chapter 5.7 : The Karmarkar algorithm, pages 504–527. North Holland, New York, NY, USA, 1989.

[243] P. Ghare. Free decision variables and simplified interior point methods for linear programming. Talk held at the Symposium APMOD '91— Applied Mathematical Programming and Modelling, Brunel University, London, UK, Northern Virginia Graduate Centre, USA, January 1991.

[244] G. de Ghellinck and J. P. Vial. A polynomial Newton method for linear programming. *Algorithmica*, 1(4):425–453, 1986.

[245] G. de Ghellinck and J. P. Vial. An extension of Karmarkar's algorithm for solving a system of linear homogeneous equations on the simplex. *Mathematical Programming*, 39:79–92, 1987.

[246] G. de Ghellinck and J. P. Vial. A unified approach to projective and affine algorithms for linear programming. Talk held at the EURO/TIMS Joint International Conference on Operational Research in Paris, France, Center of Operations Research and Econometrics, Universite Catholique de Louvain, B-1348 Louvain-la-Neuve, Belgium, July 1988.

[247] P. E. Gill, A. Marxen, W. Murray, M. A. Saunders, and M. H. Wright. Solution of the primal LP-problem by a barrier method : Some implementation aspects. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, April 1988.

[248] P. E. Gill, W. Murray, D. B. Ponceleon, and M. A. Saunders. Preconditioners for indefinite systems arising in optimization. Technical Report SOL 90-8, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, June 1990.

[249] P. E. Gill, W. Murray, D. B. Ponceleon, and M. A. Saunders. Primal–dual methods for linear programming. Technical Report SOL 91-3, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, May 1991.

[250] P. E. Gill, W. Murray, D. B. Ponceleon, and M. A. Saunders. Solving reduced KKT–systems in barrier methods for linear and quadratic programming. Technical Report SOL 91-7, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, July 1991.

[251] P. E. Gill, W. Murray, and M. A. Saunders. Interior–point methods for linear programs : A challenge to the simplex method. Technical Report SOL 88–14, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, July 1988.

[252] P. E. Gill, W. Murray, and M. A. Saunders. A single – phase dual barrier method for linear programming. Technical Report SOL 88–10, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, August 1988.

[253] P. E. Gill, W. Murray, M. A. Saunders, J. A. Tomlin, and M. H. Wright. On projected Newton barrier methods for linear programming and an equivalence to Karmarkar's projective method. *Mathematical Programming*, 36:183–209, 1986.

[254] P. E. Gill, W. Murray, M. A. Saunders, and M. H. Wright. A note on nonlinear approaches to linear programming. Technical Report SOL 86–7, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, April 1986.

[255] P. E. Gill, W. Murray, M. A. Saunders, and M. H. Wright. Convergence results for a shifted barrier linear programming method. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, April 1988.

[256] P. E. Gill, W. Murray, M. A. Saunders, and M. H. Wright. Shifted barrier methods for linear programming. Technical Report SOL 88–9, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, August 1988.

[257] P. E. Gill, W. Murray, and M. H. Wright. *Numerical Linear Algebra and Optimization, Vol. 2.* Addison Wesley Publishing Company, Amsterdam, The Netherlands, 1991/92. Chapter on interior point methods.

[258] N. D. Glassman. ONR (Office of Naval Research) focuses on interior methods. *SIAM News*, 20(2):12, March 1987.

[259] J. Gleick. Breakthrough in problem solving. *The New York Times*, November 19, 1984.

[260] H. Goessl. Eine Modifikation des Verfahrens von Karmarkar basierend auf einer Formulierung des Algorithmus im Originalproblem (A modification of Karmarkar's algorithm based on a formulation of the algorithm in the original problem). Interner Bericht der intergrierten Arbeitsgruppe Mathematische Probleme aus dem Ingenieurbereich, Fachbereich Mathematik, Gesamthochschule Wuppertal, D-5600 Wuppertal 1, Germany, October 1986. (In German).

[261] H. Goessl. Eine Verallgemeinerung und eine duale Variante des Verfahrens von de Ghellinck und Vial zur linearen Optimierung (A generalization and a dual variant of the algorithm of de Ghellinck and Vial for linear programming). Interner Bericht der intergrierten Arbeitsgruppe Mathematische Probleme aus dem Ingenieurbereich, Fachbereich Mathematik, Gesamthochschule Wuppertal, D-5600 Wuppertal 1, Germany, December 1987. (In German).

[262] H. Goessl. *Varianten der polynomialen Newtonmethode zur linearen Optimierung (Variants of the polynomial Newton method for linear programming)*. PhD thesis, Fachbereich Mathematik, Gesamthochschule Wuppertal, D-5600 Wuppertal 1, Germany, 1989. (In German).

[263] J. L. Goffin. Affine methods in nondifferentiable optimization. CORE Discussion Paper 8744, Center for Operations Research and Econometrics, Universite Catholique de Louvain, B-1348 Louvain-la-Neuve, Belgium, 1987.

[264] J. L. Goffin. Affine and projective methods in nondifferentiable optimization. In K. H. Hoffmann, J. B. Hiriat-Urruty, C. Lemarechal, and J. Zowe, editors, *Trends in Mathematical Optimization : Proceedings of the 4th French–German Conference on Optimization in Irsee, West Germany, April 1986*, volume 84 of *International Series of Numerical Mathematics*, pages 79–91. Birkhäuser Verlag, Basel, Switzerland, 1988.

[265] J. L. Goffin. Decomposition and large scale optimization with the interior point algorithms. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Faculty of Management, McGill University, Montreal, Ontario, Canada, October 1990.

[266] J. L. Goffin, A. Haurie, and J. P. Vial. Decomposition and nondifferentiable optimization with the projective algorithm. Preprint G–89–25,

Faculty of Management, McGill University, Montreal, Ontario, Canada, 1989.

[267] J. L. Goffin, A. Haurie, J. P. Vial, and D. L. Zhu. Using central prices in the decomposition of linear programs. Research Working Paper Series, Faculty of Management, McGill University, Montreal, Ontario, Canada, 1991.

[268] J. L. Goffin and J. P. Vial. On the computation of weighted analytic centers and dual ellipsoids with the projective algorithm. Working Paper, Faculty of Management, McGill University, Montreal, Ontario, Canada, 1989.

[269] J. L. Goffin and J. P. Vial. Cutting planes and column generation techniques with the projective algorithm. *Journal of Optimization Theory and Applications*, 65:409–429, 1990.

[270] J. L. Goffin and J. P. Vial. Short steps with Karmarkar's projective algorithm for linear programming. Manuscript, Department d'Economic Commerciale et Industrielle, Universite de Geneve, Geneve, Switzerland, 1990.

[271] A. V. Goldberg, S. A. Plotkin, D. B. Shmoys, and E. Tardos. Interior–point methods in parallel computation. In *Proceedings of the 30th Annual Symposium on Foundations of Computer Science, Research Triangle Park, NC, USA, 1989*, pages 350–355. IEEE Computer Society Press, Los Alamitos, CA, USA, 1990.

[272] D. Goldfarb. A relaxed version of Karmarkar's method. Talk held at the ORSA/TIMS Joint National Meeting in Miami Beach, FL, USA, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, October 1986.

[273] D. Goldfarb. A primal projective interior point method for linear programming. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, January 1990.

[274] D. Goldfarb and S. Liu. Interior point potential function reduction algorithm for solving convex quadratic programming. Technical Report, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, 1990.

[275] D. Goldfarb and S. Liu. An $O(n^3L)$ primal interior point algorithm for convex quadratic programming. *Mathematical Programming*, 49:325–340, 1990/91.

[276] D. Goldfarb, S. Liu, and S. Wang. A logarithmic barrier function algorithm for quadratically constrained convex programming. *SIAM Journal on Optimization*, 1:252–267, 1991.

[277] D. Goldfarb and S. Mehrotra. A homogeneous equations variant of Karmarkar's algorithm for solving linear programs. Talk held at ORSA/TIMS Joint National Meeting in New Orleans, USA, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, May 1987.

[278] D. Goldfarb and S. Mehrotra. Relaxed variants of Karmarkar's algorithm for linear programs with unknown optimal objective value. *Mathematical Programming*, 40:183–195, 1988.

[279] D. Goldfarb and S. Mehrotra. A relaxed version of Karmarkar's method. *Mathematical Programming*, 40:289–315, 1988.

[280] D. Goldfarb and S. Mehrotra. A self-correcting version of Karmarkar's algorithm. *SIAM Journal on Numerical Analysis*, 26:1006–1015, 1989.

[281] D. Goldfarb and M. J. Todd. Karmarkar's projective scaling algorithm. In G. L. Nemhauser, A. H. G. Rinnoy Kan, and M. J. Todd, editors, *Optimization*, volume 1 of *Handbooks in Operations Research and Management Science*, pages 141–170. North Holland, Amsterdam, The Netherlands, 1989.

[282] D. Goldfarb and D. Xiao. A primal projective interior point method for linear programming. *Mathematical Programming*, 51:17–43, 1991.

[283] E. G. Gol'shtejn, A. S. Nemirovsky, and Y. E. Nesterov. On some recent advances in optimization. *Ekonomika i Matematickeskie Metody (Moscow)*, 26(1):178–190, 1990. (In Russian).

[284] J. Gondzio. An advanced implementation of Cholesky factorization for computing projections in interior point methods for large scale linear programming. Cahier 107, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, December 1991.

[285] J. Gondzio. Splitting dense columns of constraint matrix in interior point methods for large scale linear programming. Cahier 105, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France,

July 1991. Former title : *On handling dense columns of constraint matrix in interior point methods of large scale linear programming*, April 1991. To appear in *Optimization*.

[286] J. Gondzio and D. Tachat. The design and application of the IMPLO – A FORTRAN library for linear optimization with interior point methods. Cahier 108, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, January 1992.

[287] C. C. Gonzaga. A conical projection algorithm for linear programming. Memorandum UCB/ERL M85/61, Electronics Research Laboratory, University of California, Berkeley, CA 94720, USA, July 1985.

[288] C. C. Gonzaga. New results in conical projection methods for mathematical programming. Talk held at the ORSA/TIMS Joint National Meeting in Miami Beach, FL, USA, Dept. of Electrical Engineering and Computer Science, University of California, Berkeley, CA 94720, USA, October 1986.

[289] C. C. Gonzaga. Trust region minimization in conical projection algorithms. Talk held at the Eleventh IFORS International Conference on Operations Research in Buenos Aires, Argentina, Dept. of Electrical Engineering and Computer Science, University of California, Berkeley, CA 94720, USA, August 1987.

[290] C. C. Gonzaga. A simple representation of Karmarkar's algorithm. Technical Report, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, May 1988.

[291] C. C. Gonzaga. An algorithm for solving linear programming problems in $O(n^3L)$ operations. In N. Megiddo, editor, *Progress in Mathematical Programming : Interior Point and Related Methods*, pages 1–28. Springer-Verlag, New York, NY, USA, 1989.

[292] C. C. Gonzaga. Conical projection algorithms for linear programming. *Mathematical Programming*, 43:151–173, 1989.

[293] C. C. Gonzaga. Path–following algorithms for linear and quadratic programming. Talk held at the Third SIAM Conference on Optimization in Boston, MA, USA, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, April 1989.

[294] C. C. Gonzaga. Convergence of the large step primal affine–scaling algorithm for primal nondegenerate linear programs. Technical Report ES–230/90, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, September 1990.

[295] C. C. Gonzaga. Large steps potential reduction algorithms for linear programming. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, July 1990.

[296] C. C. Gonzaga. A larger step path–following potential reduction algorithm for linear programming. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, January 1990.

[297] C. C. Gonzaga. On lower bound updates in primal potential reduction methods for linear programming. Technical Report ES–227/90, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, 1990. To appear in *Mathematical Programming, Series B, 1991.*

[298] C. C. Gonzaga. An overview of $O(\sqrt{n}L)$–iteration algorithms for linear programming. Talk held at the 14th Conference on the Mathematics of Operations Research in Dalfsen, The Netherlands, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, January 1990.

[299] C. C. Gonzaga. Polynomial affine algorithms for linear programming. *Mathematical Programming*, 49:7–21, 1990.

[300] C. C. Gonzaga. Interior point algorithms for linear programming problems with inequality constraints. *Mathematical Programming*, 52:209–225, 1991.

[301] C. C. Gonzaga. An interior trust region method for linearly constrained optimization. *COAL Newsletter*, 19:55–66, August 1991.

[302] C. C. Gonzaga. Large steps path–following methods for linear programming, Part I : Barrier function method. *SIAM Journal on Optimization*, 1:268–279, 1991.

[303] C. C. Gonzaga. Large steps path–following methods for linear programming, Part II : Potential reduction method. *SIAM Journal on Optimization*, 1:280–292, 1991.

[304] C. C. Gonzaga. On the convergence of the large step affine–scaling algorithm for linear programming. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, July 1991.

[305] C. C. Gonzaga. Path following methods for linear programming. Technical Report ES–246/91, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, November 1991. To appear in *SIAM Reviews 34, 1991*.

[306] C. C. Gonzaga. Search directions for interior linear programming methods. *Algorithmica*, 6:153–181, 1991.

[307] C. C. Gonzaga and L. A. Carlos. A primal affine–scaling algorithm for linearly constrained convex programs. Technical Report ES–238/90, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, December 1990.

[308] C. C. Gonzaga and M. J. Todd. An $O(\sqrt{n}L)$–iteration large–step primal–dual affine algorithm for linear programming. Technical Report 862, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1989.

[309] P. Gray, J. A. Kaliski, and Y. Ye. An implementation of the build–up interior method for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, College of Business, Dept. of Management Sciences, University of Iowa, Iowa City, IA 52242, USA, May 1991.

[310] M. Grötschel. Patente für mathematische Algorithmen. (Patents for mathematical algorithms). *Mitteilungen der Deutschen Mathematiker–Vereinigung*, Heft 2:52–56, April 1991. (In German).

[311] L. K. Grover. A force based approach to interior point algorithms for linear programming. Technical Report, School of Electrical Engineering, Cornell University, Ithaca, NY 14853, USA, 1990.

[312] L. K. Grover. Interior point methods for unimodular linear programming. Technical Report, School of Electrical Engineering, Cornell University, Ithaca, NY 14853, USA, 1990.

[313] L. K. Grover. Strongly polynomial interior point algorithm for a class of linear programming problems. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, School of Electrical Engineering, Cornell University, Ithaca, NY 14853, USA, October 1990.

[314] O. Güler. Existence of interior points and interior paths in nonlinear monotone complementarity problems. Working Paper, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1990.

[315] O. Güler. An interior point algorithm for nonlinear monotone complementarity problems. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, October 1990.

[316] O. Güler. Path following and potential reduction algorithms for nonlinear monotone complementarity problems. Working Paper (in preparation), Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1991.

[317] O. Güler, D. den Hertog, C. Roos, T. Terlaky, and T. Tsuchiya. Degeneracy in interior point methods for linear programming. Technical Report, Faculty of Technical Mathematics and Computer Science, TU Delft, NL-2600 GA Delft, The Netherlands, December 1991.

[318] O. Güler and Y. Ye. Convergence behavior of some interior point algorithms. Working Paper 91–04, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1991. To appear in *Mathematical Programming*.

[319] O. Güler and Y. Ye. Interior point algorithms for LP generate strictly complementary solutions. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, May 1991.

[320] M. Hamala. A general approach to interior point transformation methods for mathematical programming. *Acta Mathematica Universitatis Comenianae (Comenius University Czechoslovakia)*, 54/55:243–266, 1989.

[321] B. C. Hamilton and D. E. Stein. AT & T's KORBX System : Solving the unsolvable. *AT & T Technology*, 4(3):36–41, 1989.

[322] G. Hämmerlin and K. H. Hoffmann. *Numerische Mathematik*, chapter 9.4.4 : Polynomiale Algorithmen, pages 424–430. Springer-Verlag, Berlin, Germany, second edition, 1991. (In German).

[323] C. G. Han, P. M. Pardalos, and Y. Ye. Computational aspect of an interior point algorithm for quadratic programming problems with box constraints. In T. F. Coleman and Y. Li, editors, *Large–Scale Numerical Optimization, Papers from the Workshop held at Cornell University, Ithaca, NY, USA, October 1989*, volume 46 of *SIAM Proceedings in Applied Mathematics*, pages 92–112. Society of Industrial and Applied Mathematics (SIAM), Philadelphia, PA, USA, 1990.

[324] C. G. Han, P. M. Pardalos, and Y. Ye. Interior point approaches to nonconvex programming. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Computer Science Department, The Pennsylvania State University, University Park, PA 16802, USA, October 1990.

[325] C. G. Han, P. M. Pardalos, and Y. Ye. On potential reduction algorithms for some entropy optimization problems. Technical Report CS–91–02, Computer Science Department, The Pennsylvania State University, University Park, PA 16802, USA, 1991.

[326] C. G. Han, P. M. Pardalos, and Y. Ye. Solving some engineering problems using an interior–point algorithm. Technical Report CS–91–04, Computer Science Department, The Pennsylvania State University, University Park, PA 16802, USA, 1991.

[327] P. T. Harker and B. Xiao. A polynomial–time algorithm for affine variational inequalities. *Applied Mathematics Letters*, 4(2):31–34, 1991.

[328] C. A. Haverly. Behavior of the simplex and Karmarkar algorithms. Talk held at the 12th Symposium on Mathematical Programming in Cambridge, MA, USA, Haverly Systems Inc., Denville, NJ 07834, USA, 1985.

[329] C. A. Haverly. Results of a new series of case runs using Karmarkar's algorithm. Technical Report, Haverly Systems Inc., Denville, NJ 07834, USA, 1985.

[330] C. A. Haverly. Studies on behavior of the Karmarkar method. Technical Report, Haverly Systems Inc., Denville, NJ 07834, USA, 1985.

[331] G. Heindl. Eine Implementierung des Karmarkar Verfahrens (An implementation of Karmarkar's algorithm). Interner Bericht der intergrierten Arbeitsgruppe Mathematische Probleme aus dem Ingenieurbereich, Fachbereich Mathematik, Gesamthochschule Wuppertal, D-5600 Wuppertal 1, Germany, February 1985. (In German).

[332] J. Herskovits and J. Asquier. A quasi–Newton interior point algorithm for nonlinear constrained optimization. Talk held at the DGOR–Jahrestagung in Vienna, Austria, Center of Technology, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, Brazil, August 1990.

[333] D. den Hertog. Interior point methods for linear programming. Master's thesis, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, May 1989.

[334] D. den Hertog and C. Roos. A survey of search directions in interior point methods for linear programming. Technical Report 89–65, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1989. To appear in *Mathematical Programming, Series B, 1991*.

[335] D. den Hertog, C. Roos, and T. Terlaky. On the classical logarithmic barrier function method for a class of smooth convex programming problems. Technical Report 90–28, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1990.

[336] D. den Hertog, C. Roos, and T. Terlaky. A potential reduction method for a class of smooth convex programming problems. Technical Report 90–01, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1990.

[337] D. den Hertog, C. Roos, and T. Terlaky. A build–up variant of the path–following method for LP. Technical Report 91–47, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, June 1991.

[338] D. den Hertog, C. Roos, and T. Terlaky. Inverse barrier methods for linear programming. Technical Report 91–27, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1991.

[339] D. den Hertog, C. Roos, and T. Terlaky. A polynomial method of weighted centers for convex quadratic programming. *Journal of Information & Optimization Sciences*, 12(2):187–205, 1991.

[340] D. den Hertog, C. Roos, and T. Terlaky. A potential reduction variant of Renegar's short–step path–following method for linear programming. *Linear Algebra and Its Applications*, 152:43–68, 1991.

[341] D. den Hertog, C. Roos, and J. P. Vial. A complexity reduction for the long–step path–following for linear programming. Technical Report 90–28, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1990.

[342] D. den Hertog, C. Roos, and J. P. Vial. An $O(n^{0.5}L)$ complexity reduction for long step path following methods. Revised version of Technical Report 89–85, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1990. To appear in *SIAM Journal on Optimization*.

[343] D. den Hertog, C. Roos, and J. P. Vial. Polynomial–time long–steps algorithms for linear programming based on the use of the logarithmic

barrier function. Manuscript, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1990.

[344] S. Herzel, M. C. Recchioni, and F. Zirilli. A quadratically convergent method for linear programming. *Linear Algebra and Its Applications*, 152:255–289, 1991.

[345] R. Hettich and G. Margraff. Some experiments with Karmarkar's algorithm. *Optimization*, 19:653–664, 1988.

[346] R. Hettich and M. Ries. A modified scaling algorithm for LP. *Optimization*, 21:709–721, 1990.

[347] F. S. Hillier and G. J. Lieberman. *Introduction to Operations Research*, chapter 4.9 : New developments, pages 100–104, chapter 9.4 : An interior–point algorithm, pages 312–323. McGraw–Hill, fifth edition, 1990.

[348] J. K. Ho. Linear programming with spreadsheet macros. Technical Report, Management Science Program, University of Tennessee, 615-SMC, Knoxville, TN 37996-0562, USA, 1987.

[349] A. J. Hoffmann, M. Mannos, D. Sokolowsky, and N. Wiegmann. Computational experience in solving linear programs. *Journal of the Society for Industrial and Applied Mathematics (SIAM)*, 1:17–33, 1953.

[350] J. N. Hooker. Karmarkar's linear programming algorithm. *Interfaces*, 16(4):75–90, 1986. Errata in *Interfaces*, 17(1):128, 1987.

[351] D. Houck. Introduction to the AT & T KORBX System. Talk held at the ORSA/TIMS Joint National Meeting in Denver, CO, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, October 1988.

[352] E. C. Housos, C. C. Huang, and J. M. Liu. Parallel vector computational considerations on the AT & T KORBX System. Talk held at the ORSA/TIMS Joint National Meeting in Denver, CO, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, October 1988.

[353] E. C. Housos, C. C. Huang, and J. M. Liu. Parallel algorithms for the AT & T KORBX System. *AT & T Technical Journal*, 68:37–47, 1989.

[354] T. C. Hu. Linear programming algorithms and computational results, 1987. Panel–Discussion at the ORSA/TIMS Joint National Meeting in St. Louis, October 1987.

[355] S. Huang. A primal–dual algorithm for linear programming. Technical Report, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, 1989.

[356] S. Huang and K. O. Kortanek. A simultaneous primal– and dual– potential reduction algorithm for linear programming. Working Paper Series 89–2, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, 1989.

[357] S. Huang and K. O. Kortanek. A large–step simultaneous primal–dual potential reduction algorithm for LP. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, October 1990.

[358] P. Huard. Resolution of mathematical programming with nonlinear constraints by the method of centers. In J. Abadie, editor, *Nonlinear Programming*, pages 207–219. North Holland, Amsterdam, The Netherlands, 1967.

[359] P. Huard. A method of centers by upper–bounding functions with applications. In J. B. Rosen, O. L. Mangasarian, and K. Ritter, editors, *Nonlinear Programming : Proceedings of a Symposium held at the University of Wisconsin, Madison, Wisconsin, USA, May 1970*, pages 1–30. Academic Press, New York, USA, 1970.

[360] Y. Ikura and D. Stein. Computational experience with a Karmarkar– based approach to solve multi–period, multi–refinery production models. Talk held at the 12th Triennial Conference on Operations Research in Athens, Greece, AT & T Bell Laboratories, June 1990.

[361] H. Imai. Extensions of the multiplicative penalty function for linear programming. *Journal of the Operations Research Society of Japan*, 30:160–180, 1987.

[362] H. Imai. On the convexity of the multiplicative version of Karmarkar's potential function. *Mathematical Programming*, 40:29–32, 1988.

[363] H. Imai. Recent trends in linear programming. *Journal of the Institute of Electronics, Information and Communication Engineers (Japan)*, 72(10):1053–1058, 1989. (In Japanese).

[364] H. Imai. On the polynomiality of the multiplicative penalty function method for linear programming and related inscribed ellipsoids. *Transactions of the Institute of Electronics, Information and Communication Engineers (Japan)*, E74(4):669–671, April 1991.

[365] M. Iri. Another 'simple and fast' algorithm for linear programming. Talk held at the 12th Symposium on Mathematical Programming in Cambridge, MA, USA, Dept. of Mathematical Engineering and Instrumentation Physics, University of Tokyo, Tokyo, Japan, 1985.

[366] M. Iri. Integrability of vector and polyvector fields associated with interior point methods. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Dept. of Mathematical Engineering and Instrumentation Physics, University of Tokyo, Tokyo, Japan, January 1990. To appear in *Mathematical Programming, Series B, 1991*.

[367] M. Iri. A proof of the polynomiality of the Iri–Imai method for linear programming. Technical Report, Dept. of Mathematical Engineering and Instrumentation Physics, University of Tokyo, Tokyo, Japan, 1991.

[368] M. Iri and H. Imai. A multiplicative penalty function for linear programming– another 'new and fast' algorithm. *Proceedings of the 6th Mathematical Programming Symposium of Japan, Tokyo, Japan*, pages 97–120, 1985.

[369] M. Iri and H. Imai. A multiplicative barrier function method for linear programming. *Algorithmica*, 1(4):455–482, 1986.

[370] M. Iri and H. Imai. Theory of the multiplicative penalty function method for linear programming. In D. S. Johnson, T. Nishizeki, A. Nozaki, and H. S. Wilf, editors, *Discrete Algorithms and Complexity : Proceedings of the Japan–US Joint Seminar, Kyoto, Japan, June 1986*, pages 417–435. Academic Press, New York, NY, USA, 1987.

[371] G. M. Jan. *A new variant of the primal affine scaling algorithm for linear programs*. PhD thesis, Dept. of Operations Research, North Carolina State University, Raleigh, NC 27695-7913, USA, July 1990.

[372] G. M. Jan and S. C. Fang. A variant of affine–scaling method for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, North Carolina State University, Raleigh, NC 27695-7913, USA, October 1989.

[373] G. M. Jan and S. C. Fang. A new variant of the primal affine scaling method for linear programs. *Optimization*, 22(5):681–715, 1991.

[374] J. Janacek. Perspektivy Karmarkarova algoritmu v linearnim programovani (Perspectives of Karmarkar's algorithm in linear programming). *Ekonomicko–Matematicky Obzor (Czechoslovakia)*, 25(1):50–63, 1989. (In Czech).

[375] F. Jarre. Convergence of the method of analytic centers for generalized convex programs. DFG–Report 67, Institut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, May 1988. Revised October 1988.

[376] F. Jarre. The method of analytic centers for smooth convex programs. Preprint 165, Institut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, 1989.

[377] F. Jarre. *The method of analytic centers for smooth convex programs.* PhD thesis, Institut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, 1989.

[378] F. Jarre. On the method of analytic centers for solving smooth convex programs. In S. Dolecki, editor, *Optimization : Proceedings of the 5th French–German Conference in Castel–Novel, Varetz, France, October 1988*, volume 1405 of *Lecture Notes in Mathematics*, pages 69–86. Springer-Verlag, Berlin, Germany, 1989.

[379] F. Jarre. A homotopy method for convex programming. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Institut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, January 1990.

[380] F. Jarre. Interior–point methods for convex programming. Technical Report SOL 90–16, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, 1990.

[381] F. Jarre. On the convergence of the method of analytic centers when applied to convex quadratic programs. *Mathematical Programming*, 49:341–358, 1990/91.

[382] F. Jarre and M. A. Saunders. An adaptive primal–dual method for linear programming. *COAL Newsletter*, 19:7–16, August 1991.

[383] F. Jarre, G. Sonnevend, and J. Stoer. An implementation of the method of analytic centers. In A. Bensoussan and J. L. Lions, editors, *Analysis and Optimization of Systems*, volume 111 of *Lecture Notes in Control and Information Sciences*, pages 297–308. Springer-Verlag, Berlin, Germany, 1988.

[384] F. Jarre, G. Sonnevend, and J. Stoer. On the complexity of a numerical algorithm for solving generalized convex quadratic programs by following a central path. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 233–242. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[385] D. L. Jensen and A. E. Steger. A variation of Karmarkar's algorithm to solve linear programs in standard form. Talk held at the ORSA/TIMS Joint National Meeting in Los Angeles, CA, USA, State University of New York, Stony Brook, NY 11794, USA, April 1986.

[386] J. Ji, F. Potra, R. A. Tapia, and Y. Zhang. An interior–point method with polynomial complexity and superlinear convergence for linear complementarity problems. Technical Report, Dept. of Mathematics, The University of Iowa, Iowa City, IA 52242, USA, 1991. Technical Report TR–91–23, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, 1991.

[387] H. W. Jung, R. E. Marsten, and M. J. Saltzman. The column Cholesky method for numerical factorization in interior point algorithms. Technical Report 596, Dept. of Mathematical Sciences,Clemson University, Clemson, SC, USA, 1991.

[388] B. Kalantari. Solving linear programming by bisection and a projective feasibility algorithm. Technical Report LCSR–TR–91, Laboratory for Computer Science Research, Rutgers University, New Brunswick, NJ 08903, USA, 1987.

[389] B. Kalantari. Derivation of a generalized and strengthened Gordan Theorem from generalized Karmarkar potential and logarithmic barrier functions. Technical Report LCSR–TR–121, Laboratory for Computer Science Research, Rutgers University, New Brunswick, NJ 08903, USA, 1989.

[390] B. Kalantari. Generalization of Karmarkar's algorithm to convex homogeneous functions. Technical Report LCSR–TR–130, Laboratory for Computer Science Research, Rutgers University, New Brunswick, NJ 08903, USA, 1989.

[391] B. Kalantari. Canonical problems for quadratic programming and projective methods for their solution. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 243–263. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[392] B. Kalantari. Karmarkar's algorithm with improved steps. *Mathematical Programming*, 46:73–78, 1990.

[393] J. A. Kaliski and Y. Ye. Convergence behavior of Karmarkar's projective algorithm for solving a simple linear program. *Operations Research Letters*, 10:389–393, 1991.

[394] J. A. Kaliski and Y. Ye. A decomposition variant of the potential reduction algorithm for linear programming. Working Paper, Dept. of Management Science, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, 1991.

[395] M. Kallio. On gradient projection for linear programming. Manuscript, School of Organization and Management, Yale University, New Haven, CT 06520, USA, 1986.

[396] M. Kallio and E. L. Porteus. A class of methods for linear programming. *Mathematical Programming*, 14:161–176, 1978.

[397] A. P. Kamath, N. K. Karmarkar, K. G. Ramakrishnan, and M. G. C. Resende. Computational experience with an interior point algorithm on the satisfiability problem. *Annals of Operations Research*, 25:43–58, 1990.

[398] R. Kannan and W. R. Pulleyblank. *Integer Programming and Combinatorial Optimization*. University of Waterloo Press, Waterloo, Ontario, Canada, 1990.

[399] S. Kapoor and P. M. Vaidya. Fast algorithms for convex quadratic programming and multicommodity flows. *Proceedings of the 18th Annual ACM Symposium on Theory of Computing*, pages 147–159, 1986.

[400] S. Kapoor and P. M. Vaidya. An extension of Karmarkar's interior point method to convex quadratic programming. Technical Report, Dept. of Computer Science, University of Illinois at Urbana–Champaign, Urbana, IL 61820, USA, 1988.

[401] S. Kapoor and P. M. Vaidya. Speeding–up Karmarkar's algorithm for multicommodity flows. Technical Report, Dept. of Computer Science, University of Illinois at Urbana–Champaign, Urbana, IL 61820, USA, 1989. To appear in *Mathematical Programming*.

[402] H. Karloff. *Linear Programming*. Birkhäuser Verlag, Basel, Switzerland, 1991. Chapter on Karmarkar's algorithm.

[403] N. K. Karmarkar. A new polynomial–time algorithm for linear programming. *Proceedings of the 16th Annual ACM Symposium on Theory of Computing*, pages 302–311, 1984.

[404] N. K. Karmarkar. A new polynomial–time algorithm for linear programming. *Combinatorica*, 4:373–395, 1984.

[405] N. K. Karmarkar. Some comments on the significance of the new polynomial–time algorithm for linear programming. Technical Report, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1984.

[406] N. K. Karmarkar. Why is the new algorithm better than simplex method and ellipsoid method ? Extended Abstract, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1984/85.

[407] N. K. Karmarkar. Recent developments in new approaches to linear programming. Talk held at the SIAM Conference on Optimization, Houston, TX, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1987.

[408] N. K. Karmarkar. An interior–point approach to NP–complete problems. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1988.

[409] N. K. Karmarkar. Methods and apparatus for efficient resource allocation. U.S. Patent No. 4.744.028, 1988. AT & T Bell Laboratories, Murray Hill, NJ 07974, USA.

[410] N. K. Karmarkar. An interior–point approach to NP–complete problems – Part I. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 297–308. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[411] N. K. Karmarkar. Riemannian geometry underlying interior–point methods for linear programming. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 51–75. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[412] N. K. Karmarkar. Interior point methods in optimization. Talk held at the Second International Conference on Industrial and Applied Mathematics (ICIAM '91), Washington, DC, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1991.

[413] N. K. Karmarkar, J. C. Lagarias, L. Slutsman, and P. Wang. Power–series variants of Karmarkar–type algorithms. *AT & T Technical Journal*, 68:20–36, 1989.

[414] N. K. Karmarkar and K. G. Ramakrishnan. Further developments in the new polynomial–time algorithm for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Boston, MA, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, May 1985.

[415] N. K. Karmarkar and K. G. Ramakrishnan. Implementation and computational aspects of the Karmarkar algorithm for linear programming, using an iterative method for computing projections. Talk held at the 13th International Symposium on Mathematical Programming in Tokyo, Japan, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, August 1988. Extended Abstract circulated at the Symposium.

[416] N. K. Karmarkar and K. G. Ramakrishnan. Computational results of an interior point algorithm for large scale linear programming. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, January 1990. To appear in *Mathematical Programming, Series B, 1991.*

[417] N. K. Karmarkar and K. G. Ramakrishnan. Robust control system models and their solution by the Karmarkar algorithm. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1990.

[418] N. K. Karmarkar, K. G. Ramakrishnan, and M. G. C. Resende. An interior point algorithm for zero–one integer programming. Talk held at the ORSA/TIMS Joint National Meeting in Denver, CO, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, October 1988.

[419] N. K. Karmarkar, K. G. Ramakrishnan, and M. G. C. Resende. An interior–point approach to the maximum independent set problem in dense random graphs. Manuscript (in preparation), AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1988/1990.

[420] N. K. Karmarkar, K. G. Ramakrishnan, and M. G. C. Resende. An interior point algorithm to solve computationally difficult set covering problems. Extended Abstract, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1989. To appear in *Mathematical Programming, Series B, 1991.*

[421] N. K. Karmarkar, K. G. Ramakrishnan, and M. G. C. Resende. Further developments on an interior point algorithm for zero–one integer programming. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, January 1990.

[422] N. K. Karmarkar and L. P. Sinha. Application of Karmarkar's algorithm to overseas telecommunications facilities planning. Talk held at the 12th International Symposium on Mathematical Programming in Boston, MA, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, August 1985.

[423] J. Käschel. Karmarkar–ähnliche Verfahren in der Linearen Optimierung (Karmarkar–type procedures in linear programming). Talk held at the DGOR–Jahrestagung in Stuttgart–Hohenheim, Germany, Sektion Wirtschaftswissenschaften, TU Chemnitz, P. O. Box 964, D-9010 Chemnitz, East Germany, September 1991.

[424] R. Katsura, M. Fukushima, and T. Ibaraki. Interior methods for nonlinear minimum cost network flow problems. *Journal of the Operations Research Society of Japan*, 32:174–179, 1989.

[425] J. L. Kennington. Using KORBX for military airlift applications. *Proceedings of the 28th IEEE Conference on Decision and Control*, pages 1603–1605, December 1989.

[426] A. Keraghel. *Etude adaptive et comparative des principales variantes dans l'algorithme de Karmarkar*. PhD thesis, Laboratoire ARTEMIS (IMAG), Universite Joseph Fourier, BP 68, F-38402 St. Martin d'Heres Cedex, France, 1989. (In French).

[427] L. G. Khachian and M. J. Todd. On the complexity of approximating the maximal inscribed ellipsoid for a polytope. Technical Report 893, School of Operations Research and Industrial Engineering, College of Engineering, Cornell University, Ithaca, NY 14853, USA, 1990.

[428] K. Kim and J. L. Nazareth. The decomposition principle and algorithms for linear programming. *Linear Algebra and Its Applications*, 152:119–133, 1991.

[429] E. A. Knyazev. The method of centers with adaptation of parameters on the basis of the steepest descent. *Issledovaniya po Prikladnoi Matematike (Kazanskii Universitet)*, 15:13–24, 1988. (In Russian).

[430] M. Kojima. Determining basic variables of optimal solutions in Karmarkar's new LP algorithm. *Algorithmica*, 1(4):499–515, 1986.

[431] M. Kojima, Y. Kurita, and S. Mizuno. Large–step interior point algorithms for linear complementarity problems. Research Reports on Information Sciences, Ser. B : Operations Research B–243, Dept. of Information Sciences, Tokyo Institute of Technology, Oh-Okayama, Meguro-ku, Tokyo 152, Japan, 1991.

[432] M. Kojima and N. Megiddo. The relation between the path of centers and Smale's regularization of the linear programming problem. *Linear Algebra and Its Applications*, 152:135–139, 1991.

[433] M. Kojima, N. Megiddo, and S. Mizuno. A general framework of continuation methods for complementarity problems. Research Report RJ 7720 (71585), IBM Almaden Research Division, San Jose, CA 95120-6099, USA, 1990.

[434] M. Kojima, N. Megiddo, and S. Mizuno. Theoretical convergence of large–step–primal–dual interior point algorithms for linear programming. Research Report RJ 7872 (72532), IBM Almaden Research Division, San Jose, CA 95120-6099, USA, 1990. To appear in *Mathematical Programming*.

[435] M. Kojima, N. Megiddo, and T. Noma. Homotopy continuation methods for complementarity problems. Research Report RJ 6638 (63949), IBM Almaden Research Division, San Jose, CA 95120-6099, USA, 1989.

[436] M. Kojima, N. Megiddo, and T. Noma. Homotopy continuation methods for nonlinear complementarity problems. Research Report, IBM Almaden Research Division, San Jose, CA 95120-6099, USA, 1989.

[437] M. Kojima, N. Megiddo, T. Noma, and A. Yoshise. *A unified approach to interior point algorithms for linear complementarity problems*, volume 538 of *Lecture Notes in Computer Science*. Springer-Verlag, Berlin, Germany, 1991.

[438] M. Kojima, N. Megiddo, T. Noma, and A. Yoshise. A unified approach to interior point algorithms for linear complementarity problems : A summary. *Operations Research Letters*, 10:247–254, 1991.

[439] M. Kojima, N. Megiddo, and Y. Ye. An interior point potential reduction algorithm for the linear complementarity problem. Technical Report RJ 6486, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA, 1988. To appear in *Mathematical Programming*.

[440] M. Kojima, S. Mizuno, and T. Noma. A new continuation method for complementarity problems with uniform P–functions. *Mathematical Programming*, 43:107–113, 1989.

[441] M. Kojima, S. Mizuno, and T. Noma. Limiting behavior of trajectories by a continuation method for monotone complementarity problems. *Mathematics of Operations Research*, 15(4):662–675, 1990.

[442] M. Kojima, S. Mizuno, and A. Yoshise. A polynomial–time algorithm for a class of linear complementarity problems. *Mathematical Programming*, 44:1–26, 1989.

[443] M. Kojima, S. Mizuno, and A. Yoshise. A primal–dual interior point algorithm for linear programming. In N. Megiddo, editor, *Progress in Mathematical Programming : Interior Point and Related Methods*, pages 29–47. Springer-Verlag, New York, NY, USA, 1989.

[444] M. Kojima, S. Mizuno, and A. Yoshise. Ellipsoids that contain all the solutions of a positive semi–definite linear complementarity problems. *Mathematical Programming*, 48:415–435, 1990.

[445] M. Kojima, S. Mizuno, and A. Yoshise. A little theorem of the $Big - M$ in interior point algorithms. Research Reports on Information Sciences, Ser. B : Operations Research B–239, Dept. of Information Sciences, Tokyo Institute of Technology, Oh-Okayama, Meguro-ku, Tokyo 152, Japan, February 1991.

[446] M. Kojima, S. Mizuno, and A. Yoshise. An $O(\sqrt{n}L)$ iteration potential reduction algorithm for linear complementarity problems. *Mathematical Programming*, 50:331–342, 1991.

[447] M. Kojima and K. Tone. An efficient implementation of Karmarkar's new LP algorithm. Research Reports on Information Sciences, Ser. B : Operations Research B–180, Dept. of Information Sciences, Tokyo Institute of Technology, Oh-Okayama, Meguro-ku, Tokyo 152, Japan, 1986.

[448] G. Kolata. A fast way to solve hard problems. *Science*, 225:1379–1380, September 1984.

[449] H. Konno. Recent advances in linear programming. *Journal of the Japan Society of Simulation Technology*, 6(1):18–26, March 1987. (In Japanese).

[450] H. Konno and Y. Yajima. Path–following algorithms for solving non-convex programming problems. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Institute of Human and Social Science, Institute of Technology, 2-12-1 Oh-Okayama, Meguro-ku, Tokyo 152, Japan, October 1990.

[451] K. O. Kortanek. Vector–supercomputer experiments with the linear programming scaling algorithm. Working Paper Series 87–2, Dept. of Management Science, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, 1987. To appear in *SIAM Journal on Scientific and Statistical Computations (1991 ?)*.

[452] K. O. Kortanek. A second order affine scaling algorithm for the geometric programming dual with logarithmic barrier. Talk held at the DGOR–Jahrestagung in Vienna, Austria, Dept. of Management Science, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, August 1990.

[453] K. O. Kortanek, S. Huang, and J. Zhu. Central path trajectories and controlled dual perturbations for geometric programming. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Dept. of Management Science, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, November 1991.

[454] K. O. Kortanek, D. N. Leo, and M. Shi. An application of a hybrid algorithm for semi–infinite programming. Talk held at the 12th Symposium on Mathematical Programming, Cambridge, MA, USA, Dept. of Management Science, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, 1985.

[455] K. O. Kortanek and H. No. A second order affine scaling algorithm for the geometric programming dual with logarithmic barrier. Working Paper Series 90–07, Dept. of Management Science, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, 1990.

[456] K. O. Kortanek, F. Potra, and Y. Ye. On some efficient interior point methods for nonlinear convex programming. *Linear Algebra and Its Applications*, 152:169–189, 1991.

[457] K. O. Kortanek and M. Shi. Convergence results and numerical experiments on a linear programming hybrid algorithm. *European Journal of Operational Research*, 32:47–61, 1987.

[458] K. O. Kortanek and J. Zhu. New purification algorithms for linear programming. *Naval Research Logistics Quarterly*, 35:571–583, 1988.

[459] K. O. Kortanek and J. Zhu. Controlling the parameter in the logarithmic barrier term for convex programming problems. Working Paper Series 90–12, Dept. of Management Science, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, 1990.

[460] A. Korytowski. Inner search methods for linear programming. *Zastosowania Matematyki (Warshaw, Poland)*, 20(2):307–327, 1990.

[461] V. V. Kovacevic–Vujcic. Improving the rate of convergence of interior point methods for linear programming. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, University of

Belgrade, Belgrade, Yugoslavia, January 1990. To appear in *Mathematical Programming, Series B, 1991.*

[462] A. Kozlov. The Karmarkar algorithm : Is it for real ? *SIAM News*, 18(6):1, 4, 13, November 1985.

[463] A. Kozlov and L. W. Black. Berkeley obtains new results with Karmarkar algorithm. *SIAM News*, 19(3):3, 20, May 1986.

[464] E. Kranich. Interior point methods for mathematical programming : A bibliography. Discussion Paper 171, Institute of Economy and Operations Research, FernUniversität Hagen, P.O. Box 940, D-5800 Hagen 1, Germany, May 1991. The (actual) bibliography can be accessed electronically by sending e–mail to '*netlib@research.bell-labs.com*' with message '*send index from bib*'.

[465] J. C. Lagarias. Analytic algorithms for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in New Orleans, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, May 1987.

[466] J. C. Lagarias. The nonlinear geometry of linear programming, Part III : Projective Legrende transform coordinates and Hilbert geometry. *Transactions of the American Mathematical Society*, 320:193–225, 1990.

[467] J. C. Lagarias and M. J. Todd. *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[468] L. S. Lasdon, J. C. Plummer, and G. Yu. An interior point algorithm for general nonlinear programs. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, MSIS Department, College of Business Administration, University of Texas at Austin, Austin, TX 78712, USA, November 1991.

[469] E. L. Lawler. Is Karmarkar's algorithm for real ? Talk held at the EURO VII Congress on Operations Research in Bologna, Italy, University of California, Berkeley, CA 94720, USA, June 1985.

[470] R. Levkovitz, G. Mitra, and M. Tamiz. Integration of the interior point method within simplex : Experiments in feasible basis recovery. Technical Report, Dept. of Mathematics and Statistics, Brunel University, Uxbridge, Middlesex UB8 3PH, UK, 1991.

[471] G. R. Lindfield and A. Salhi. A comparative study of the performance and implementation of the Karmarkar algorithm. Talk held at the Martin Beale Memorial Symposium in London, UK, Dept. of Computer Science and Applied Mathematics, Aston University, Birmingham B4 7ET, Great Britain, July 1987.

[472] A. Lisser. *Un logiciel derive de l'algorithme de Karmarkar pour la resolution de programmes lineaires de grande taille (A computational derivation of Karmarkar's algorithm for the solution of large–scaled linear programs).* PhD thesis, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, 1987. (In French).

[473] A. Lisser and M. J. Chifflet. A comparison of projective and affine approaches in interior point methods. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Centre National d'Etudes des Telecommunications, PAA–ATR, 38-40 Rue du General-Leclerc, F-92131 Issy-Les-Moulineaux, France, July 1991.

[474] A. Lisser, N. Maculan, and M. Minoux. Approximate one–dimensional minimization of the potential function improves the convergence speed of Karmarkar's method. Unpublished Manuscript, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, 1985.

[475] A. Lisser, N. Maculan, and M. Minoux. Large steps preserving polynomiality in Karmarkar's algorithm. Cahier 77, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, 1987.

[476] A. Lisser and P. Tolla. An efficient software using the Karmarkar's algorithm. Talk held at the EURO/TIMS Joint International Conference on Operational Research in Paris, France, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, July 1988.

[477] A. Lisser and P. Tolla. Variants of Karmarkar's algorithm. *Electricite de France (EDF) Bulletin de la Direction des Etudes et Recherches Serie C Mathematique, Informatique (Paris)*, 3:21–36, 1989.

[478] S. Liu. A long step path–following algorithm for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, May 1990.

[479] S. Liu and D. Goldfarb. Interior point potential function reduction algorithms for solving convex quadratic programming. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, October 1989.

[480] F. A. Lootsma. *Numerical Methods for Nonlinear Optimization.* Academic Press, London, UK, 1972.

[481] H. Luss. Optimization : Methodolgy, algorithms and applications. *AT & T Technical Journal,* 68:3–6, 1989.

[482] I. J. Lustig. A practical approach to Karmarkar's algorithm. Technical Report SOL 85–5, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, June 1985.

[483] I. J. Lustig. An experimental analysis of the convergence rate of an interior point algorithm. Technical Report SOR 88–5, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, March 1988.

[484] I. J. Lustig. A generic primal–dual interior point algorithm. Technical Report SOR 88–3, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, 1988.

[485] I. J. Lustig. Identifying an optimal basis of a linear program using an interior point method. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, April 1988.

[486] I. J. Lustig. An analysis of an available set of linear programming test problems. *Computers and Operations Research,* 16:173–184, 1989. Augmented version in the Technical Report SOL 87-11, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, 1987.

[487] I. J. Lustig. Phase 1 search directions for a primal–dual interior point method for linear programming. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988,* volume 114 of *Contemporary Mathematics,* pages 121–130. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[488] I. J. Lustig. Feasibility issues in an interior point method for linear programming. *Mathematical Programming*, 49:145–162, 1990/91.

[489] I. J. Lustig. An implementation of a strongly polynomial time algorithm for basis recovery. Technical Report (in preparation), School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, 1991.

[490] I. J. Lustig, R. E. Marsten, and D. F. Shanno. On implementing Mehrotra's predictor–corrector interior point method for linear programming. Technical Report SOR 90–03, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, April 1990. To appear in *SIAM Journal on Optimization*.

[491] I. J. Lustig, R. E. Marsten, and D. F. Shanno. The primal–dual interior point method on the Cray supercomputer. In T. F. Coleman and Y. Li, editors, *Large–Scale Numerical Optimization, Papers from the Workshop held at Cornell University, Ithaca, NY, USA, October 1989*, volume 46 of *SIAM Proceedings in Applied Mathematics*, pages 70–80. Society of Industrial and Applied Mathematics (SIAM), Philadelphia, PA, USA, 1990.

[492] I. J. Lustig, R. E. Marsten, and D. F. Shanno. Recent computational experience with the primal–dual interior point method for linear programming. Technical Report RRR 46–89, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, 1990.

[493] I. J. Lustig, R. E. Marsten, and D. F. Shanno. Starting and restarting the primal–dual interior point method. Technical Report SOR 90–14, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, 1990.

[494] I. J. Lustig, R. E. Marsten, and D. F. Shanno. Computational experience with a primal–dual interior point method for linear programming. *Linear Algebra and Its Applications*, 152:191–222, 1991.

[495] I. J. Lustig, R. E. Marsten, and D. F. Shanno. The interaction of algorithms and architectures for interior point methods. Technical Report SOR 91–18, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, July 1991.

[496] I. J. Lustig, R. E. Marsten, and D. F. Shanno. Interior method vs. simplex method : Beyond *netlib*. *COAL Newsletter*, 19:41–44, August 1991.

[497] I. J. Lustig, R. E. Marsten, and D. F. Shanno. Recent advances in the OB1 interior point code. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, May 1991.

[498] I. J. Lustig, J. M. Mulvey, and T. J. Carpenter. The formulation of stochastic programs for interior point methods. *Operations Research*, 39(5):757–770, 1991.

[499] I. J. Lustig, D. F. Shanno, and J. W. Gregory. The primal–dual interior point method on a Cray supercomputer. Technical Report SOR 89–21, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, 1989.

[500] S. Maier. Primal–duales innere–Punkte–Verfahren mit endlicher Genauigkeit zur Lösung linearer Programme (A primal–dual interior point method with finite accuracy for solving linear programs). Master's thesis, Institut für Mathematik der Naturwissenschaftlichen Fakultät der Universität Augsburg, D-8900 Augsburg, Germany, 1989. (In German).

[501] O. L. Mangasarian and R. Setiono. Serial and parallel interior proximal point methods for linear programs. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Dept. of Computer Science, University of Wisconsin, Madison, WI 53706, USA, May 1990.

[502] G. Margraff. Analyse und Modifikation des Karmarkar Verfahrens (Analysis and modification of Karmarkar's algorithm). Master's thesis, Universität Trier, Fachbereich IV, D-5500 Trier, Germany, 1987. (In German).

[503] R. E. Marsten. The IMP System on personal computers. Talk held at the ORSA/TIMS Joint National Meeting in St. Louis, USA, Dept. of MIS, University of Arizona, Tucson, AZ 85721, USA, October 1987.

[504] R. E. Marsten. Interior point methods for large scale linear programming. Talk held at the Second International Conference on Industrial and Applied Mathematics (ICIAM '91), Washington, DC, USA, School of Industrial and Systems Engineering, Georgia Technology Institute, Atlanta, GA 30322-0205, USA, July 1991.

[505] R. E. Marsten and M. J. Saltzman. A dual–affine interior point algorithm for LP's with bounded variables. Talk held at the ORSA/TIMS Joint National Meeting in Denver, CO, USA, Dept. of MIS, University of Arizona, Tucson, AZ 85721, USA, October 1988.

[506] R. E. Marsten, M. J. Saltzman, J. W. Gregory, T. G. Hewitt, and D. F. Shanno. The dual affine interior point method for linear programming implementation on Cray supercomputers. Talk held at the CORS/ORSA/TIMS Joint National Meeting in Vancouver, British Columbia, Canada, School of Industrial and Systems Engineering, Georgia Technology Institute, Atlanta, GA 30322-0205, USA, May 1989.

[507] R. E. Marsten, M. J. Saltzman, D. F. Shanno, J. F. Ballintijn, and G. S. Pierce. Implementation of a dual affine interior point algorithm for linear programming. *ORSA Journal on Computing*, 1:287–297, 1989.

[508] R. E. Marsten and D. F. Shanno. On implementing Karmarkar's algorithm. Technical Report, Dept. of MIS, University of Arizona, Tucson, AZ 85721, USA, 1985.

[509] R. E. Marsten and D. F. Shanno. Interior point methods for linear programming : Ready for production use. Workshop at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, School of Industrial and System Engineering, Georgia Institute of Technology, Atlanta, GA 30322, USA, October 1990.

[510] R. E. Marsten and D. F. Shanno. Recent computational experience with the primal–dual interior point method. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, School of Industrial and Systems Engineering, Georgia Technology Institute, Atlanta, GA 30322-0205, USA, January 1990.

[511] R. E. Marsten, R. Subramaniam, M. J. Saltzman, I. J. Lustig, and D. F. Shanno. Interior point methods for linear programming : Just call Newton, Lagrange, and Fiacco and McCormick ! *Interfaces*, 20(4):105–116, 1990.

[512] C. Martinhon and C. C. Gonzaga. A unified analysis of affine and projective primal potential reduction algorithms for linear programming. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Dept. of Systems Engineering and Computer Science, COPPE Federal University of Rio de Janeiro, 21941 Rio de Janeiro, RJ, Brazil, July 1991.

[513] A. Marxen. Primal barrier methods for linear programming. Technical Report SOL 89–6, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, June 1989.

[514] A. Marxen. *Primal barrier methods for linear programming.* PhD thesis, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, 1989.

[515] K. Masuzawa, S. Mizuno, and M. Mori. A polynomial time interior point algorithm for minimum cost flow problems. *Journal of the Operations Research Society of Japan*, 33:157–167, 1990.

[516] C. McDiarmid. Why Karmarkar's method is fast ? Talk held at the EURO/TIMS Joint International Conference on Operational Research in Paris, France, Institute of Economics and Statistics, St. Cross Building, Oxford University, Oxford OX1 3UL, UK, July 1988.

[517] C. McDiarmid. On the improvement per iteration in Karmarkar's method for linear programming. *Mathematical Programming*, 46:299–320, 1990.

[518] J. F. McQueen. Symposium on Karmarkar's algorithm and related algorithms for linear programming. *Bulletin of the Institute of Mathematics and Its Applications*, 21:154–155, 1985.

[519] K. A. McShane. A superlinearly convergent $O(\sqrt{n}L)$ iteration primal–dual linear programming algorithm. Manuscript, 2537 Villanova Drive, Vienna, Virginia, USA, 1991.

[520] K. A. McShane, C. L. Monma, and D. F. Shanno. An implementation of a primal–dual interior point method for linear programming. *ORSA Journal on Computing*, 1:70–83, 1989.

[521] N. Megiddo. A variation on Karmarkar's algorithm. Preliminary Report, IBM Research Division, Almaden Research Center, San Jose, CA 95120-6099, USA, 1985.

[522] N. Megiddo. Introduction : New approaches to linear programming. *Algorithmica*, 1(4):387–394, 1986.

[523] N. Megiddo. *New Approaches to Linear Programming*, volume 1(4) of *Algorithmica*. Springer-Verlag, Berlin, Germany, 1986.

[524] N. Megiddo. Linear programming (1986). *Annual Review of Computer Science*, 2:119–145, 1987.

[525] N. Megiddo. On the complexity of linear programming. In T. F. Bewley, editor, *Advances in Economic Theory—The Fifth World Congress*, volume 12 of *Econometric Society Monographs*, pages 225–258. Cambridge University Press, Cambridge, UK, 1987.

[526] N. Megiddo. Report on the conference : Progress in mathematical programming. Technical Report RJ 5923, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA, October 1987.

[527] N. Megiddo. Switching from a primal–dual Newton algorithm to a primal–dual (interior) simplex algorithm. Technical Report RJ 6327, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA, 1988.

[528] N. Megiddo. Pathways to the optimal set in linear programming. In N. Megiddo, editor, *Progress in Mathematical Programming : Interior Point and Related Methods*, pages 131–158. Springer-Verlag, New York, NY, USA, 1989. Identical version in : *Proceedings of the 6th Mathematical Programming Symposium of Japan, Nagoya, Japan*, pages 1–35, 1986.

[529] N. Megiddo. *Progress in Mathematical Programming : Interior Point and Related Methods*. Springer-Verlag, New York, NY, USA, 1989.

[530] N. Megiddo. On solving the linear programming problem approximately. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 35–50. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[531] N. Megiddo. On finding primal– and dual–optimal bases. *ORSA Journal on Computing*, 3:63–65, 1991.

[532] N. Megiddo and M. Shub. Boundary behavior of interior point algorithms in linear programming. *Mathematics of Operations Research*, 14:97–114, 1987.

[533] S. Mehrotra. A self-correcting version of Karmarkar's algorithm. Technical Report, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, 1986.

[534] S. Mehrotra. Implementation of some interior point methods for linear programming : Recent developments. Talk held at the ORSA/TIMS

Joint National Meeting in St. Louis, USA, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, October 1987.

[535] S. Mehrotra. *Variants of Karmarkar's algorithm : Theoretical complexity and practical implementation.* PhD thesis, Dept. of Industrial Engineering and Operations Reseach, Columbia University, New York, NY 10027, USA, 1987.

[536] S. Mehrotra. Implementation of affine scaling methods : Approximate solutions of systems of linear equations using preconditioned conjugate gradient methods. Technical Report 89–04, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, August 1989.

[537] S. Mehrotra. Implementation of affine scaling methods : Towards faster implementations with complete Cholesky factor in use. Technical Report 89–15, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, October 1989.

[538] S. Mehrotra. On implementation of interior point methods for linear programming : Karmarkar's preconditioners. Talk held at the CORS/ORSA/TIMS Joint National Meeting in Vancouver, British Columbia, Canada, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, May 1989.

[539] S. Mehrotra. Higher order methods and their performance. Technical Report TR 90–16R1, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, 1990. Revised July 1991.

[540] S. Mehrotra. Implementations of affine scaling methods : Speeding up the computation. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, May 1990.

[541] S. Mehrotra. On an implementation of the primal–dual predictor–corrector algorithms. Talk held at the Second Asilomar Workshop on Progress in Mathematical Programming, Asilomar, CA, USA, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, February 1990.

[542] S. Mehrotra. On the implementation of a (primal–dual) interior point method. Technical Report 90–03, Dept. of Industrial Engineering and

Management Science, Northwestern University, Evanston, IL 60208, USA, March 1990. Revised June 1990.

[543] S. Mehrotra. Deferred rank–one updates in $O(n^3 L)$ interior point algorithm. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, November 1991.

[544] S. Mehrotra. Finite termination and superlinear convergence in primal–dual methods. Technical Report 91–13, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, July 1991.

[545] S. Mehrotra. Generalized prediction–corrector methods for solving linear programs. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, May 1991.

[546] S. Mehrotra. Handling free variables in interior methods. Technical Report 91–06, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, March 1991.

[547] S. Mehrotra. Higher–order methods for solving linear programs. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, May 1991.

[548] S. Mehrotra. On finding a vertex solution using interior point methods. *Linear Algebra and Its Applications*, 152:233–253, 1991.

[549] S. Mehrotra and J. Sun. An algorithm for convex quadratic programming that requires $O(n^{3.5} L)$ arithmetic operations. *Mathematics of Operations Research*, 15:342–363, 1990.

[550] S. Mehrotra and J. Sun. An interior point algorithm for solving smooth convex programs based on Newton's method. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 265–284. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[551] S. Mehrotra and J. Sun. Path–following methods for convex programming. Talk held at the SIAM Annual Meeting in Chicago, IL, USA,

Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, July 1990.

[552] S. Mehrotra and J. Sun. A method of analytic centers for quadratically constrained convex quadratic programs. *SIAM Journal on Numerical Analysis*, 28(2):529–544, 1991.

[553] S. Mehrotra and J. Sun. On computing the center of a quadratically constrained set. *Mathematical Programming*, 50:81–89, 1991.

[554] S. Mehrotra and Y. Ye. On finding the optimal facet of linear programs. Technical Report TR 91–10, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, 1991.

[555] M. S. Meketon. Least absolute value regression. Working Paper, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1985.

[556] M. S. Meketon. Optimization in simulation : A survey of recent results. In A. Thesen, H. Grant, and W. D. Kelton, editors, *Proceedings of the Winter Simulation Conference held in Atlanta, GA 30322, USA,December 1987*, pages 58–67. ACM Press, New York, NY, USA, 1987.

[557] M. S. Meketon and R. J. Vanderbei. Degeneracy issues in the affine scaling algorithm. Talk held at the ORSA/TIMS Joint National Meeting in St. Louis, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, October 1987.

[558] J. Mennicken. Implementation of a first order central path following algorithm for solving large linear programs. Technical Report 202, Institut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, 1990.

[559] R. R. Meyer and G. L. Schultz. Structured interior point methods for multicommodity flows. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Dept. of Computer Science, University of Wisconsin, Madison, WI 53706, USA, October 1990.

[560] S. Miagen and T. Miyazaki. Implementation and numerical experiments on an interior–point algorithm for linear programming. In *Proceedings of the InfoJapan '90 : Information Technology Harmonizing with Society, Tokyo, Japan, Oct. 1990*, volume 1, pages 19–25. North Holland, Amsterdam, The Netherlands, 1990.

[561] M. Minoux. New suggested implementation of Karmarkar's algorithm. Cahier 71, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, May 1986.

[562] J. E. Mitchell. An interior point column generation method for linear programming with shifted barriers. RPI Technical Report 191, Rensselaer Polytechnic Institute, Dept. of Mathematical Sciences, Troy, NY 12180-3590, USA, 1988.

[563] J. E. Mitchell. *Karmarkar's algorithm and combinatorial optimization problems*. PhD thesis, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853-7501, USA, 1988.

[564] J. E. Mitchell. A note on updating lower bounds when using Karmarkar's projective algorithm for linear programming. RPI Technical Report 190, Rensselaer Polytechnic Institute, Dept. of Mathematical Sciences, Troy, NY 12180-3590, USA, 1990.

[565] J. E. Mitchell. An interior point column generation method for linear programming using shifted barriers. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Rensselaer Polytechnic Institute, Dept. of Mathematical Sciences, Troy, NY 12180-3590, USA, November 1991.

[566] J. E. Mitchell and M. J. Todd. Two variants of Karmarkar's linear programming algorithm for problems with some unrestricted variables. Technical Report 741, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853-7501, USA, 1987.

[567] J. E. Mitchell and M. J. Todd. Solving linear ordering problems using Karmarkar's algorithm. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853-7501, USA, 1988.

[568] J. E. Mitchell and M. J. Todd. Solving perfect matching problems using Karmarkar's algorithm. Technical Report, Rensselaer Polytechnic Institute, Dept. of Mathematical Sciences, Troy, NY 12180-3590, USA, 1988.

[569] J. E. Mitchell and M. J. Todd. On the relationship between the search directions in the affine and projective variants of Karmarkar's linear programming algorithm. In B. Cornet and H. Tulkens, editors, *Contributions to Operations Research and Economics : The Twentieth Anniversary of CORE*, pages 237–250. M.I.T. Press, Cambridge, MA, USA, 1989.

[570] J. E. Mitchell and M. J. Todd. Solving combinatorial optimization problems using Karmarkar's algorithm, Part I : Theory. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853-7501, USA, 1989.

[571] J. E. Mitchell and M. J. Todd. Solving combinatorial optimization problems using Karmarkar's algorithm, Part II : Computational results. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853-7501, USA, 1989.

[572] J. E. Mitchell and M. J. Todd. A variant of Karmarkar's linear programming algorithm for problems with some unrestricted variables. *SIAM Journal on Matrix Analysis and Applications*, 10:30–38, 1989.

[573] J. E. Mitchell and M. J. Todd. Solving combinatorial optimization problems using Karmarkar's algorithm. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853-7501, USA, May 1990. Revised February 1991.

[574] J. E. Mitchell and M. J. Todd. Solving matching problems using Karmarkar's algorithm. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 309–318. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[575] G. Mitra, M. Tamiz, and J. Yadegar. Experimental investigation of an interior search method within a simplex framework. *Communications of the ACM*, 31(12):1474–1482, 1988.

[576] G. Mitra, M. Tamiz, and J. Yadegar. A hybrid algorithm for linear programming. In A. J. Osiadacz, editor, *Simulation and Optimization of Large Systems*, volume 13 of *The Institute of Mathematics and Its Applications Conference Series*, pages 143–159. Clarendon Press, Oxford, UK, 1988.

[577] S. Mizuno. A new polynomial time method for a linear complementarity problem. Technical Report 16, Dept. of Management Science and Engineering, Tokyo Institute of Technology, Oh-Okayama, Meguro-ku, Tokyo 152, Japan, 1989.

[578] S. Mizuno. An $O(n^3L)$ algorithm using a sequence for linear complementarity problems. *Journal of the Operations Research Society of Japan*, 33:66–75, 1990.

[579] S. Mizuno. A rank–one updating interior algorithm for linear programming. *Arabian Journal for Science and Engineering*, 15(4):671–677, 1990.

[580] S. Mizuno. $O(n^\rho L)$ iteration $O(n^3 L)$ potential reduction algorithms for linear programming. *Linear Algebra and Its Applications*, 152:155–168, 1991.

[581] S. Mizuno and K. Masuzawa. Polynomial time interior point algorithms for transportation problems. *Journal of the Operations Research Society of Japan*, 32:371–382, 1989.

[582] S. Mizuno and M. J. Todd. An $O(n^3 L)$ adaptive path following algorithm for a linear complementarity problem. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1989. To appear in *Mathematical Programming, Series B, 1991*.

[583] S. Mizuno and M. J. Todd. An $O(n^3 L)$ long step path following algorithm for a linear complementarity problem. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1989. To appear in *Mathematical Programming*.

[584] S. Mizuno, M. J. Todd, and Y. Ye. Anticipated behavior of long step algorithms for linear programming. Technical Report 24, Dept. of Management Science and Engineering, Tokyo Institute of Technology, Oh-Okayama, Meguro-ku, Tokyo 152, Japan, 1989.

[585] S. Mizuno, M. J. Todd, and Y. Ye. Anticipated behavior of path–following algorithms for linear programming. Technical Report 878, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1989.

[586] S. Mizuno, M. J. Todd, and Y. Ye. Anticipated behavior of interior point algorithms for linear programming. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1990.

[587] S. Mizuno, M. J. Todd, and Y. Ye. Anticipated behavior of long–step algorithms for linear programming. Technical Report 882, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1990.

[588] S. Mizuno, M. J. Todd, and Y. Ye. On adaptive step primal–dual interior–point algorithms for linear programming. Technical Report 944, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, October 1990. To appear in *Mathematics of Operations Research*.

[589] S. Mizuno, A. Yoshise, and T. Kikuchi. Practical polynomial time algorithms for linear complementarity problems. *Journal of the Operations Research Society of Japan*, 32:75–92, 1989.

[590] C. L. Monma. Recent breakthroughs in linear programming methods. Internal Memorandum, Bell Communications Research, Morristown, NJ 07960, USA, 1987.

[591] C. L. Monma. Successful implementations of interior algorithms. *SIAM News*, 22(2):14–16, March 1989.

[592] C. L. Monma and A. J. Morton. Computational experience with the dual affine variant of Karmarkar's method for linear programming. *Operations Research Letters*, 6:261–267, 1987.

[593] R. D. C. Monteiro. Convergence and boundary behavior of the projective scaling trajectories for linear programming. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 213–229. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[594] R. D. C. Monteiro. On the continuous trajectories for a potential reduction algorithm for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, May 1990.

[595] R. D. C. Monteiro. An implementation of range analysis for LP problems solved via interior point methods. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Dept. of Systems and Industrial Engineering, University of Arizona, Tucson, AZ 85721, USA, July 1991.

[596] R. D. C. Monteiro and I. Adler. An $O(n^3 L)$ primal–dual interior point algorithm for linear programming. Technical Report ORC 87–4, Dept. of Industrial Engineering and Operations Research, University of California, Berkeley, CA 94720, USA, 1987.

[597] R. D. C. Monteiro and I. Adler. A polynomial primal–dual affine algorithm for LP. Talk held at the ORSA/TIMS Joint National Meeting in Denver, CO, USA, Engineering Systems Research Center, University of California, Berkeley, CA 94720, USA, October 1988.

[598] R. D. C. Monteiro and I. Adler. Interior path following primal–dual algorithms : Part I : Linear programming. *Mathematical Programming*, 44:27–41, 1989.

[599] R. D. C. Monteiro and I. Adler. Interior path following primal–dual algorithms : Part II : Convex quadratic programming. *Mathematical Programming*, 44:43–66, 1989.

[600] R. D. C. Monteiro and I. Adler. An extension of Karmarkar–type algorithm to a class of convex separable programming problems with global linear rate of convergence. *Mathematics of Operations Research*, 15:408–422, 1990.

[601] R. D. C. Monteiro, I. Adler, and M. G. C. Resende. A polynomial–time primal–dual affine scaling algorithm for linear and convex quadratic programming and its power series extension. *Mathematics of Operations Research*, 15:191–214, 1990.

[602] T. L. Morin, B. Haas, and T. B. Trafalis. Implementation of an interior point algorithm for multiobjective optimization. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Dept. of Mathematics and Computer Science, School of Industrial Engineering, Purdue University, West Lafayette, IN 47907, USA, May 1990.

[603] T. L. Morin and T. B. Trafalis. A polynomial–time algorithm for finding an efficient face of a polyhedron. Technical Report, Dept. of Mathematics and Computer Science, School of Industrial Engineering, Purdue University, West Lafayette, IN 47907, USA, 1989.

[604] A. M. Morshedi and R. A. Tapia. Karmarkar as a classical method. Technical Report TR 87–7, Rice University, Dept. of Mathematical Sciences, Houston, TX 77251, USA, August 1987.

[605] H. Müller-Merbach. Right through the interior with the simplex technique. Technical Report, University of Kaiserslautern, D-6100 Kaiserslautern, Germany, 1987.

[606] J. M. Mulvey and A. Ruszczynski. A diagonal quadratic approximation method for large scale linear programs. Technical Report SOR 90–08, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, 1990.

[607] J. M. Mulvey and A. Ruszczynski. A parallel interior point method for multistage stochastic optimization. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, School of Engineering and Applied Science, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, November 1991.

[608] S. Murray. An interior point conjugate gradient approach to the generalized flow problem with costs. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, November 1991.

[609] W. Murray. Methods for large–scale linear programming. In S. W. Wallace, editor, *Algorithms and Model Formulations in Mathematical Programming*, volume F51 of *NATO ASI Series*, pages 115–137. Springer-Verlag, Berlin, Germany, 1989.

[610] W. Murray and M. H. Wright. Line search procedures for the logarithmic barrier function. Manuscript, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1991.

[611] K. G. Murty. A new interior variant of the gradient projection method for linear programming. Technical Report 85–18, Dept. of Operations Research, University of Michigan, Ann Arbor, MI 48103, USA, 1985.

[612] K. G. Murty. The gravitational method for linear programming. *Journal of the Operational Research Society of India (Opsearch)*, 23:206–214, 1986.

[613] K. G. Murty. *Linear complementarity, linear and nonlinear programming*, volume 3 of *Sigma Series in Applied Mathematics*, chapter 11.4.4 : The gravitational method for linear programming, pages 498–506. Heldermann Verlag, Nassauische Str. 26, D-1000 Berlin 31, Germany, 1988.

[614] K. G. Murty. *Linear complementarity, linear and nonlinear programming*, volume 3 of *Sigma Series in Applied Mathematics*, chapter 11.4.1 : The Karmarkar's algorithm for linear programming, pages 469–494. Heldermann Verlag, Nassauische Str. 26, D-1000 Berlin 31, Germany, 1988.

[615] K. G. Murty and Y. Fathi. A feasible direction method for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Boston, MA, USA, Dept. of Operations Research, University of Michigan, Ann Arbor, MI 48103, USA, April 1985.

[616] S. G. Nash. Optimization at ICIAM '91. *SIAM News*, 24(5):16, September 1991.

[617] J. L. Nazareth. Some parallels in the historical development of the simplex and interior point methods for linear programming. Mathematics Note, Dept. of Pure and Applied Mathematics, Washington State University, Pullman, WA 99164-2930, USA, 19..(?).

[618] J. L. Nazareth. Karmarkar's method and homotopies with restart. CDSS Report, University of California, Berkeley, CA 94720, USA, 1985.

[619] J. L. Nazareth. Homotopy techniques in linear programming. *Algorithmica*, 1(4):529–535, 1986.

[620] J. L. Nazareth. Pricing criteria in linear programming. In N. Megiddo, editor, *Progress in Mathematical Programming : Interior Point and Related Methods*, pages 105–130. Springer-Verlag, Berlin, Germany, 1989.

[621] J. L. Nazareth. The homotopy principle and algorithms for linear programming. *SIAM Journal on Optimization*, 1(3):316–332, 1991.

[622] G. L. Nemhauser and L. A. Wolsey. *Integer and Combinatorial Optimization*, chapter I.6.4 : A projective algorithm for linear programming, pages 164–172. John Wiley & Sons, New York, NY, USA, 1988.

[623] A. S. Nemirovskiy. An algorithm of the Karmarkar type. *Teknicheskaya Kibernetika*, 1:105–118, 1987. Translated in : *Soviet Journal on Computers and System Sciences*, 25(5):61–74, 1987.

[624] A. S. Nemirovskiy. An new polynomial algorithm for linear programming. *Doklady Akademii Nauk SSSR*, 298(6):1321–1325, 1988. Translated in : *Soviet Mathematics Doklady*, 37(1): 264–269, 1988.

[625] Y. Y. Nesterov. Polynomial methods in the linear and quadratic programming. *Teknicheskaya Kibernetika*, 3:3–6, 1988. Translated in : *Soviet Journal on Computers and System Sciences*, 26:98–101, 1988.

[626] Y. Y. Nesterov. Polynomial–time dual algorithms for linear programming. *Kibernetika*, 25(1):34–40, 1989. Translated in : *Cybernetics*, 25(1):40–49, 1989.

[627] Y. Y. Nesterov and A. S. Nemirovsky. Acceleration and parallelization of the path–following interior point method for a linearly constrained convex quadratic problem. *SIAM Journal on Optimization*, 1(4):548–564, 1991.

[628] J. von Neumann. On a maximization problem. Manuscript, Institute for Advanced Studies, Princeton University, Princeton, NJ 08544, USA, 1947.

[629] W. Nickel, W. Rödder, L. Xu, and H. J. Zimmermann. Intelligent gradient search in linear programming. *European Journal of Operational Research*, 22:293–303, 1985.

[630] T. Noma. *A globally convergent iterative algorithm for complementarity problems : A modification of interior point algorithms for linear complementarity problems*. PhD thesis, Dept. of Information Science, Tokyo

Institute of Technology, 2-12-1 Oh-Okayama, Meguro-ku, Tokyo 152, Japan, 1991.

[631] T. Noma and M. Kojima. A global, convergent iterative algorithm for complementarity problems. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Dept. of Information Science, Tokyo Institute of Technology, 2-12-1 Oh-Okayama, Meguro-ku, Tokyo 152, Japan, July 1991.

[632] T. Noma, N. Megiddo, M. Kojima, and A. Yoshise. Some classes of linear complementarity problems that can be processed by interior point methods. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Dept. of Information Science, Tokyo Institute of Technology, 2-12-1 Oh-Okayama, Meguro-ku, Tokyo 152, Japan, October 1990.

[633] M. A. Nunez Araya. *Experiments using variants of Dikin's ellipsoid method for solving mathematical programs*. PhD thesis, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, 1990.

[634] E. A. Nurminskii, S. K. Andrusenko, and P. I. Stetsyuk. A new polynomial algorithm for linear programming. *Kibernetika (Kiev)*, 4:118–120, 136, 1985. (In Russian, English summary).

[635] T. Oohori and A. Ohuchi. Symbolic generation of an optimal Karmarkar's algorithm for sparse linear programs. In H. J. Sebastian and K. Tammer, editors, *System Modelling and Optimization : Proceedings of the 14th IFIP–Confernce, Leipzig, East Germany, July 1989*, volume 143 of *Lecture Notes in Control and Information Science*, pages 194–203. Springer-Verlag, Berlin, Germany, 1990.

[636] M. R. Osborne. Dual barrier functions with superfast rates of convergence for the linear programming problem. *Journal of the Australian Mathematical Society, Ser. B*, 29:39–58, 1987.

[637] M. R. Osborne. An interior point method for linear programming. *Journal of the Australian Mathematical Society, Ser. B*, 31:367–378, 1990.

[638] M. W. Padberg. Solution of a nonlinear programming problem arising in the projective method for linear programming. Technical Report, School of Business and Administration, New York University, New York, NY 10003, USA, March 1985. To appear in *SIAM Journal on Control and Optimization*.

[639] M. W. Padberg. A different convergence proof of the projective method for linear programming. *Operations Research Letters*, 4:253–257, 1986.

[640] R. Pai, N. K. Karmarkar, and S. S. S. P. Rao. A global router based on Karmarkar's interior point method. CSE Technical Report, Indian Institute of Technology, Bombay, India, April 1988.

[641] V. Pan. The modified barrier function method for linear programming and its extension. *Computers and Mathematics with Applications*, 20(3):1–14, 1990.

[642] V. Pan and J. Reif. Efficient parallel linear programming. *Operations Research Letters*, 5:127–135, 1986.

[643] V. Pan and J. Reif. Fast and efficient linear programming and linear least–squares computations. *Computers and Mathematics with Applications Ser. A*, 12:1217–1227, 1986.

[644] P. M. Pardalos. Interior point algorithms for nonconvex quadratic problems. Talk held at the DGOR–Jahrestagung in Vienna, Austria, Dept. of Computer Science, Pennsylvania State University, University Park, PA 16802, USA, August 1990.

[645] P. M. Pardalos. Polynomial time algorithms for some classes of constrained nonconvex quadratic problems. *Optimization*, 21:843–853, 1990.

[646] P. M. Pardalos, C. G. Han, J. A. Kaliski, and Y. Ye. Solution of quadratic programming and linear complementarity problems using a potential reduction algorithm. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Dept. of Computer Science, Pennsylvania State University, University Park, PA 16802, USA, May 1991.

[647] P. M. Pardalos, C. G. Han, and Y. Ye. Computational aspects of an interior point algorithm for quadratic problems with box constraints. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, Dept. of Computer Science, Pennsylvania State University, University Park, PA 16802, USA, July 1990.

[648] P. M. Pardalos, C. G. Han, and Y. Ye. Interior–point algorithms for solving nonlinear optimization problems. *COAL Newsletter*, 19:45–54, August 1991.

[649] P. M. Pardalos, Y. Ye, and C. G. Han. An interior point algorithm for large–scale quadratic problems with box constraints. In A. Bensoussan and J. L. Lions, editors, *Analysis and Optimization of Systems : Proceedings of the 9th International Conference, Antibes, France, 1990*, volume 144 of *Lecture Notes in Control and Information Science*, pages 413–422. Springer-Verlag, Berlin, Germany, 1990.

[650] P. M. Pardalos, Y. Ye, and C. G. Han. Parallel computing in quadratic programming. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Dept. Computer Science, Pennsylvania State University, University Park, PA 16802, USA, May 1990.

[651] P. M. Pardalos, Y. Ye, and C. G. Han. Algorithms for the solution of quadratic knapsack problems. *Linear Algebra and Its Applications*, 152:69–91, 1991.

[652] P. M. Pardalos, Y. Ye, C. G. Han, and J. A. Kaliski. Solution of P_0–matrix linear complementarity problems using a potential reduction algorithm. Technical Report CS–90–32, Dept. of Computer Science, Pennsylvania State University, University Park, PA 16802, USA, 1990. To appear in *SIAM Journal on Matrix Analysis and Applications, 1991*.

[653] Q. Paris. A primer on Karmarkar's algorithm for linear programming. *METU Studies in Develpoment*, 12(1–2):131–155, 1985.

[654] G. R. Parisot. Resolution numerique approchee du probleme de programmation lineaire par application de la programmation logarithmique (Approximate numerical solution of linear programming problems by an application of the logarithmic programming). *Revue Francaise Recherche Operationelle*, 20:227–259, 1961. (In French).

[655] R. G. Parker and R. L. Rardin. *Discrete Optimization*, chapter 4.1.3 : Karmarkar's projection scaling algorithm, pages 117–131. Academic Press, New York, NY, USA, 1988.

[656] A. B. Philpott. Linear programming made simpler than simplex. *New Scientist*, page 20, December 6 1984.

[657] P. F. Pickel. Approximate projections for the Karmarkar algorithm. Manuscript, Polytechnic Institute of New York, Farmingdale, NY, USA, 1985.

[658] P. F. Pickel. Implementing the Karmarkar algorithm using simplex techniques. Talk held at the 12th International Symposium on Mathematical Programming in Cambridge, MA, USA, Polytechnic Institute of New York, Farmingdale, NY, USA, 1985.

[659] P. F. Pickel. Preliminary computational experience with approximate projections in the Karmarkar algorithm. Technical Report, Polytechnic Institute of New York, Farmingdale, NY, USA, 1986.

[660] R. Polyak. Modified barrier and center methods. *Reports from the Moscow Refusnik Seminar, Annals of the New York Academy of Sciences*, 491:194–196, 1987.

[661] R. Polyak. Modified barrier functions in linear programming. Collected Abstracts, Mathematical Sciences Department, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA, 1988.

[662] R. Polyak. The nonlinear rescaling principle in linear programming. Technical Report RC 15030 (67093), Mathematical Sciences Department, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA, 1989.

[663] R. Polyak. Interior point methods, nonlinear and parallel optimization. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, Mathematical Sciences Department, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA, July 1990.

[664] R. Polyak. Modified barrier function : Theory and practice. Technical Report RC 15886, Mathematical Sciences Department, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA, 1990.

[665] R. Polyak. Modified interior distance function in linear programming. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Mathematical Sciences Department, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA, January 1990.

[666] D. B. Ponceleon. *Barrier methods for large–scale quadratic programming.* PhD thesis, Computer Science Department, Stanford University, Stanford, CA 94305, USA, 1990.

[667] D. B. Ponceleon. Barrier methods for large–scale quadratic programming. Technical Report SOL 91–2, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305, USA, June 1991.

[668] K. Ponnambalam. Large scale nonlinear programming using interior point and successive linear programming methods. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, Faculty of Engineering, Dept. of Electrical Engineering, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada, July 1990.

[669] K. Ponnambalam. An interior point algorithm for large scale nonlinear programming. Talk held at the Symposium APMOD '91—Applied Mathematical Programming and Modelling, Brunel University, London, UK, Faculty of Engineering, Dept. of Electrical Engineering, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada, January 1991.

[670] K. Ponnambalam, S. Seetharaman, and T. Alguindigue. Affine algorithms for L–minimization. In *Proceedings of the Sixth Multidimensional Signal Processing Workshop held in Pacific Grove, CA, USA, September 1989*, page 115. IEEE, New York, NY, USA, 1989.

[671] K. Ponnambalam and A. Vannelli. New starting and stopping steps for the dual affine variant of Karmarkar's method. Technical Report, Faculty of Engineering, Dept. of Electrical Engineering, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada, 1988.

[672] K. Ponnambalam and A. Vannelli. An inexpensive basis recovery procedure for Karmarkar's dual affine method. Technical Report, Faculty of Engineering, Dept. of Electrical Engineering, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada, 1989.

[673] K. Ponnambalam, A. Vannelli, and T. E. Unny. An application of Karmarkar's interior point linear programming algorithm for multi–reservoir operations optimization. Technical Report, Faculty of Engineering, Dept. of Electrical Engineering, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada, 1988. To appear in *Stochastic Hydrology and Hydraulics*.

[674] A. B. Poore and D. Soria. Continuation algorithms for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in New Orleans, USA, Dept. of Mathematics, Colorado State University, Fort Collins, CO 80253, USA, May 1987.

[675] F. A. Potra. Implementation of interior point methods on parallel machines. Talk held at the 16. Symposium on Operations Research in Trier, Germany, Dept. of Management Sciences, The University of Iowa, Iowa City, IA 52242, USA, September 1991.

[676] F. A. Potra and Y. Ye. Interior point methods for nonlinear complementarity problems. Working Paper, Dept. of Management Sciences, The University of Iowa, Iowa City, IA 52242, USA, 1991.

[677] M. J. D. Powell. Karmarkar's algorithm : A view from nonlinear programming. *Bulletin of the Institute of Mathematics and Its Applications*, 26(8–9):165–181, 1990.

[678] M. J. D. Powell. Is Karmarkar's method suitable for semi–infinite programming ? Talk held at the Symposium APMOD '91—Applied Mathematical Programming and Modelling, Brunel University, London, UK, University of Cambridge, Cambridge, UK, January 1991.

[679] M. D. Radosavljevic-Nicolic. Asymptotic behavior of the affine scaling variant of Karmarkar's algorithm for linear programming. In *Proceedings of the XX–th Conference 'Mathematical Optimization', Humboldt Universität Berlin, East Germany*. 1990.

[680] J. R. Rajasekera and S. C. Fang. On the convex programming approach to linear programming. *Operations Research Letters*, 10:309–312, 1991.

[681] J. Renegar. Path–following methods in linear programming. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1988.

[682] J. Renegar. A polynomial–time algorithm, based on Newton's method, for linear programming. *Mathematical Programming*, 40:59–93, 1988.

[683] J. Renegar and M. Shub. Simplified complexity analysis for Newton LP methods. Technical Report 807, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1988.

[684] M. G. C. Resende. A generalized quadratic form potential for an interior point algorithm for integer programming. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, Mathematical Sciences Research Center, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1990.

[685] M. G. C. Resende, A. P. Kamath, N. K. Karmarkar, and K. G. Ramakrishnan. Mathematical programming approach to inductive inference. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Mathematical Sciences Research Center, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, November 1991.

[686] M. G. C. Resende, N. K. Karmarkar, A. P. Kamath, and K. G. Ramakrishnan. An interior point approach to graph partitioning. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Mathematical Sciences Research Center, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1991.

[687] M. G. C. Resende and G. Veiga. A dual affine scaling algorithm for minimum cost network flow problems. Technical Report 1.3, Mathematical Sciences Research Center, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, November 1990. Revised February 1991.

[688] M. G. C. Resende and G. Veiga. An implementation of the dual affine scaling algorithm for network flow problems. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, Mathematical Sciences Research Center, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1990.

[689] M. G. C. Resende and G. Veiga. Computational investigation of an interior point linear programming algorithm for minimum cost network flow. Technical Report 1.0, Mathematical Sciences Research Center, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, August 1991.

[690] M. G. C. Resende and G. Veiga. A dual affine scaling algorithm for network flows. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Mathematical Sciences Research Center, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1991.

[691] M. G. C. Resende, G. Veiga, and I. Adler. Experimentation with interior point implementations. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Mathematical Sciences Research Center, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1991.

[692] M. G. C. Resende and M. H. Wright. Sixty–six attend interior methods workshop at Asilomar. *SIAM News*, 23(3):9, May 1990.

[693] C. Richter. *Optimierungsverfahren und BASIC–Programme (Optimization Methods and BASIC–Programs)*, chapter 2.3.2 : Das Projektionsverfahren von Karmarkar (The projection method of Karmarkar), pages 47–50, P.2.4. : Projektionsverfahren, BASIC–Programm, pages 123–124. Akademie Verlag, D-1000 Berlin, Germany, 1988. (In German).

[694] G. Rinaldi. A projective method for linear programming with box–type constraints. *Algorithmica*, 1(4):517–527, 1986.

[695] A. M. Rockett and J. C. Stevenson. Karmarkar's algorithm : A method for solving large linear programming. *BYTE*, 12(10):146–162, 1987.

[696] R. Roehrkasse. Linear programming and Operations Research. *IEEE Potentials*, 9(4):39–40, December 1990.

[697] C. Roos. On Karmarkar's projective method for linear programming. Technical Report 85–23, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1985.

[698] C. Roos. A pivoting rule of the simplex method which is related to Karmarkar's potential function. Technical Report, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1985.

[699] C. Roos. Linear programming along the trajectory of the problem. Technical Report 87–41, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1987.

[700] C. Roos. A new trajectory–following polynomial–time algorithm for the linear programming problem. Technical Report 87–87, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1987.

[701] C. Roos. On the trajectory of a linear programming problem. Technical Report 87–53, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1987.

[702] C. Roos. The influence of the potential function on the performance of a trajectory following algorithm for the linear programming problem. Technical Report 88–44, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1988.

[703] C. Roos. Linear programming along the trajectory of the problem in polynomial time. Technical Report 88–17, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1988.

[704] C. Roos. New trajectory–following polynomial–time algorithm for linear programming problems. *Journal of Optimization Theory and Applications*, 63:433–458, 1989.

[705] C. Roos. An $O(n^3 L)$ approximate center method for linear programming. In S. Dolecki, editor, *Optimization : Proceedings of the 5th French–German Conference in Castel–Novel, Varetz, France, October 1988*, volume 1405 of *Lecture Notes in Mathematics*, pages 147–158. Springer-Verlag, Berlin, Germany, 1989.

[706] C. Roos. Polynomial–time algorithms for linear programming based on the use of the logarithmic barrier penalty function. Talk held at the 14th Conference on the Mathematics of Operations Research in Dalfsen, The Netherlands, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, January 1990.

[707] C. Roos. A potential reduction method for a class of a smooth convex programming problem. Talk held at the DGOR–Jahrestagung in Vienna, Austria, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, August 1990.

[708] C. Roos. A projective variant of the approximate center method for linear programming. Technical Report 90–83, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1990.

[709] C. Roos and D. den Hertog. A polynomial method of approximate weighted centers for linear programming. Technical Report 89–13, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1989.

[710] C. Roos and J. P. Vial. Analytic centers in linear programming. Technical Report 88–74, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1988.

[711] C. Roos and J. P. Vial. A polynomial method of approximate centers for linear programming. Technical Report 88–68, Faculty of Mathematics and Informatics, TU Delft, NL-2628 BL Delft, The Netherlands, 1988. Submitted to *Mathematical Programing*.

[712] C. Roos and J. P. Vial. Long steps with the logarithmic penalty barrier function in linear programming. In J. Gabszevwicz, J. F. Richard, and L. Wolsey, editors, *Economic Decision–Making : Games, Economics and Optimization, dedicated to J. H. Dreze*, pages 433–441. Elsevier Science Publisher B.V., Amsterdam, The Netherlands, 1989.

[713] C. Roos and J. P. Vial. *Interior Point Methods, Theory and Practice : Proceedings of the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, held in Scheveningen, The Netherlands, January 1990*. Mathematical Programming, Series B. North Holland, Amsterdam, The Netherlands, 1991.

[714] S. A. Ruzinsky and E. T. Olsen. L_1 and L_∞ minimization via a variant of Karmarkar's algorithm. *IEEE Transactions on Acoustics, Speech, and Signal Processing*, 37(2):245–253, 1989.

[715] R. Saigal. Tracing homotopy paths in polynomial time. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, Dept. of Industrial and Operational Engineering, University of Michigan, Ann Arbor, MI 48109-2117, USA, April 1988.

[716] R. Saigal. Interior point methods for the transportation problem. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, Dept. of Industrial and Operational Engineering, University of Michigan, Ann Arbor, MI 48109-2117, USA, October 1989.

[717] R. Saigal. SOR–type iterative techniques for interior point methods. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Dept. of Industrial and Operational Engineering, University of Michigan, Ann Arbor, MI 48109-2117, USA, July 1991.

[718] A. Salamanca. An inner ellipsoid algorithm for linear programming. Technical Report 1–ABR/86, Dept. of Mathematics, E. T. S. de Ingenieros Industriales, Universidad Politecmia de Madrid, Madrid, Spain, 1986.

[719] A. Salhi and G. R. Lindfield. Effects of ordering and updating techniques on the performance of the Karmarkar algorithm. *R.A.I.R.O. Recherche Operationnelle/Operations Research*, 25(2):209–236, 1991.

[720] M. J. Saltzman. Parallel implementation of interior point LP algorithms. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Dept. of Mathematical Sciences, Clemson University, Clemson, SC 29634-1907, USA, May 1990.

[721] M. J. Saltzman. WRIP : A workbench for research in interior point methods. Panel–Discussion held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Dept. of Mathematical Sciences, Clemson University, Clemson, SC 29634-1907, USA, October 1990.

[722] M. J. Saltzman, R. Subramaniam, and R. E. Marsten. Implementing an interior point LP algorithm on a supercomputer. In R. Sharda, B. L. Golden, E. Wasil, O. Balci, and W. Stewart, editors, *Impacts of Recent Computer Advances on Operations Research*, pages 158–168. North Holland, Amsterdam, The Netherlands, 1989.

[723] C. M. Samuelsen and R. A. Tapia. The Dikin–Karmarkar principle for steepest descent. Talk held at the Second International Conference on Industrial and Applied Mathematics (ICIAM '91), Washington, DC, USA, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, July 1991.

[724] W. Schneider. An inner point preprocessing procedure. Talk held at the DGOR–Jahrestagung in Stuttgart–Hohernheim, Germany, Institut für Informatik, Universität Linz, P. O. Box, A-4040 Linz, Austria, September 1991.

[725] A. Schönlein. Der Algorithmus von Karmarkar—Idee, Realisation, Beispiel und numerische Erfahrungen (The Karmarkar algorithm—idea, realisation, example and numerical experiences). *Angewandte Informatik*, 8:344–353, 1986. (In German).

[726] H. Schreck. Experiences with an implementation of Karmarkar's LP–algorithm. In M. J. Beckmann, K. W. Gaede, K. Ritter, and H. Schneeweiss, editors, *Proceedings of the X. Symposium on Operations Research, Munich, Germany, August 1985*, volume 54 of *Methods of Operations Research*, pages 535–542. Anton Hain Meisenheim Verlag, Königstein-Taunus, West-Germany, 1986.

[727] A. Schrijver. The new linear programming method of Karmarkar. *CWI Newsletter*, 8:2–14, 1985.

[728] A. Schrijver. *Theory of Linear and Integer Programming*, chapter 15.1 : Karmarkar's polynomial–time algorithm for linear programming, pages 190–194. John Wiley & Sons, New York, NY, USA, 1986.

[729] A. Schrijver. The algorithm of N. K. Karmarkar for linear programming. Talk held at the 14th Conference on the Mathematics of Operations Research in Dalfsen, The Netherlands, Centre for Mathematics and Computer Science (CWI), Kruislaan 413, NL-1098 SJ Amsterdam, The Netherlands, January 1990.

[730] G. L. Schultz and R. R. Meyer. A structured interior point method. Technical Report 934, Dept. of Computer Science, University of Wisconsin, Madison, WI 53706, USA, 1990.

[731] G. L. Schultz and R. R. Meyer. An interior point method for block angular optimization. *SIAM Journal on Optimization*, 1(4):583–602, 1991.

[732] H. Schultz and W. Pulleyblank. Trends in optimization. *OR/MS Today*, 18(4):20–25, August 1991.

[733] R. Setiono. An interior dual proximal–point algorithm for linear programs. Technical Report 879, Dept. of Computer Science, University of Wisconsin, Madison, WI 53706, USA, 1989.

[734] R. Setiono. Interior dual least 2–norm algorithm for linear programs. Technical Report 950, Dept. of Computer Science, University of Wisconsin, Madison, WI 53706, USA, 1990.

[735] R. Setiono. Interior dual proximal–point algorithm using preconditioned conjugate gradient. Technical Report 951, Dept. of Computer Science, University of Wisconsin, Madison, WI 53706, USA, 1990.

[736] R. Setiono. Interior proximal–point algorithm for linear programs. Technical Report 949, Dept. of Computer Science, University of Wisconsin, Madison, WI 53706, USA, 1990.

[737] D. F. Shanno. Computing Karmarkar projections quickly. *Mathematical Programming*, 41:61–71, 1988.

[738] D. F. Shanno. Current state of primal–dual interior code. Talk held at the Second Asilomar Workshop on Progress in Mathematical Programming, Asimolar Conference Center, Pacific Grove, CA, USA, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, March 1990.

[739] D. F. Shanno. Interior–point methods for linear programming : The state–of–the–art. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, July 1990.

[740] D. F. Shanno. Interior–point methods for linear programming : The state–of–the–computational–art. Talk held at the Symposium on Mathematical Programming in Oberwolfach, Germany, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, January 1990.

[741] D. F. Shanno. An overview of interior point methods with implementation details and computational experience. Talk held at the Symposium APMOD '91—Applied Mathematical Programming and Modelling, Brunel University, London, UK, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, January 1991.

[742] D. F. Shanno and A. Bagchi. A unified view of interior point methods for linear programming. *Annals of Operations Research*, 22:55–70, 1990.

[743] D. F. Shanno and T. J. Carpenter. *Log*–barrier methods for quadratic and linearly constrained nonlinear programming. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, November 1991.

[744] D. F. Shanno and R. E. Marsten. On implementing Karmarkar's method. Working Paper 85–01, Graduate School of Administration, University of California, Davis, CA 95616, USA, 1985.

[745] D. F. Shanno and R. E. Marsten. Implementation of the Karmarkar algorithm within XMP framework. Talk held at the ORSA/TIMS Joint National Meeting in Miami Beach, FL, USA, Graduate School of Administration, University of California, Davis, CA 95616, USA, October 1986.

[746] D. F. Shanno and R. E. Marsten. A reduced–gradient variant of Karmarkar's algorithm and null–space projections. *Journal of Optimization Theory and Applications*, 57:383–397, 1988.

[747] D. F. Shanno and R. E. Marsten. Interior point methods for linear programming : Ready for production use. Workshop held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, October 1989.

[748] D. F. Shanno and R. E. Marsten. Set partitioning via interior point methods. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, October 1989.

[749] D. F. Shanno, R. E. Marsten, M. J. Saltzman, and R. Subramaniam. Solving set partitioning problems with cutting planes and an interior point method. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, October 1989.

[750] D. F. Shanno, C. L. Monma, and K. McShane. Computational experience with a primal–dual method. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, RUTCOR Center of Operations Research, Rutgers University, New Brunswick, NJ 08903, USA, April 1988.

[751] H. D. Sherali. Algorithmic insights and a convergence analysis for a Karmarkar–type of algorithm for linear programming problems. *Naval Research Logistics Quarterly*, 34:399–416, 1987.

[752] H. D. Sherali, B. O. Skarpness, and B. Kim. An assumption–free convergence analysis of the scaling algorithm for linear programs, with application to the L_1 estimation problem. *Naval Research Logistics Quarterly*, 35:473–492, 1988.

[753] R. Sheu and S. C. Fang. On the relationship of interior point methods. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Operations Research Program, North Carolina State University, Raleigh, NC 27695, USA, November 1991.

[754] M. G. Shi. Some convergence problems of interior point algorithms for linear programming. *Journal of the Tsinghua University*, 28(3):91–101, 1988. (In Chinese).

[755] M. Shub. On the asymptotic behavior of the projective rescaling algorithm for linear programming. *Journal of Complexity*, 3:258–269, 1987.

[756] M. Shub. Boundary and asymptotic behavior of interior point methods for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA, April 1988.

[757] New algorithm stirs interest. *SIAM News*, 13(1):1, 17, January 1985.

[758] D. Singh and J. N. Singh. Some remarks on Karmarkar's algorithm for linear programming. *Journal of the Bihar Mathematical Society*, 11:85–90, 1987/88.

[759] L. P. Sinha, B. A. Freedman, N. K. Karmarkar, A. Puchta, and K. G. Ramakrishnan. Overseas network planning—Application of Karmarkar's algorithm. In *Proceedings of NETWORK '86 Conference, Tarpon Spring, FL, USA*, June 1986.

[760] L. Slutsman. Implementation of primal–dual series algorithm for convex separable quadratic programming. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, October 1989.

[761] J. A. Snyman. An interior feasible direction method with constraint projections for linear programming. *Computers and Mathematics with Applications*, 20(12):43–54, 1990.

[762] J. A. Snyman and M. van Royen. A multiplex algorithm for linear programming problems. In M. Iri and K. Yajima, editors, *System Modelling and Optimization Proceedings of the 13th IFIP Conference, Tokyo, Japan, Aug./Sept. 1987*, volume 113 of *Lecture Notes in Control and Information Sciences*, pages 177–186. Springer-Verlag, Berlin, Germany, 1988.

[763] G. Sonnevend. An 'analytic center' for polyhedrons and new classes of global algorithms for linear (smooth, convex) programming. In A. Prekopa, J. Szelezsan, and B. Strazicky, editors, *System Modelling and Optimization : Proceedings of the 12th IFIP–Conference held in Budapest, Hungary, September 1985*, volume 84 of *Lecture Notes in Control and Information Sciences*, pages 866–876. Springer-Verlag, Berlin, Germany, 1986.

[764] G. Sonnevend. A new method for solving a set of linear (convex) inequalities and its applications for identification and optimization. In B. Martos, editor, *Proceedings of the 5th IFAC–IFORS Conference held in Budapest, Hungaria, June 1986*. Pergamon Press, Oxford, UK, 1987.

[765] G. Sonnevend. New algorithms in convex programming based on a notion of 'centre' (for systems of analytic inequalities) and on rational extrapolation. In K. H. Hoffmann, J. B. Hiriat-Urruty, C. Lemarechal, and J. Zowe, editors, *Trends in Mathematical Optimization : Proceedings of the 4th French–German Conference on Optimization in Irsee, Germany, April 1986*, volume 84 of *International Series of Numerical Mathematics*, pages 311–327. Birkhäuser Verlag, Basel, Switzerland, 1988.

[766] G. Sonnevend. Applications of the notion of analytic center in approximation (estimation) problem. *Journal of Computational and Applied Mathematics*, 28:349–358, 1989.

[767] G. Sonnevend. Application of analytic centers to the design of observers and feedback controllers. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Institut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, January 1990.

[768] G. Sonnevend. Applications of analytic centers for the numerical solution of semiinfinte, convex programs arising in control theory. In H. J. Sebastian and K. Tammer, editors, *System Modelling and Optimization : Proceedings of the 14th IFIP–Conference, Leipzig, East Germany, July 1989*, volume 143 of *Lecture Notes in Control and Information Sciences*, pages 413–422. Springer-Verlag, Berlin, Germany, 1990.

[769] G. Sonnevend and J. Stoer. Global ellipsoid approximations and homotopy methods for solving convex analytic programs. *Applied Mathematics & Optimization*, 21:139–166, 1990.

[770] G. Sonnevend, J. Stoer, and G. Zhao. On the complexity of following the central path by linear extrapolation in linear programming. *Methods of Operations Research*, 62:19–31, 1990.

[771] G. Sonnevend, J. Stoer, and G. Zhao. On the complexity of following the central path of linear programs by linear extrapolation. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, Insitut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, January 1990. To appear in *Mathematical Programming, Series B, 1991*.

[772] Neuer Dampf (New power). *Der Spiegel*, 38(49):239–240, 1984. (In German).

[773] A. E. Steger. An extension of Karmarkar's algorithm for bounded linear programming problems. Master's thesis, Dept. of Applied Mathematics, State University of New York, Stony Brook, NY 11794, USA, August 1985. Condensed version in : H. Schellhaas, P. van Beek, H. Isermann, R. Schmidt and M. Zijlstra, editors, *Operations Research Proceedings 1987*, pages 88–95, Springer-Verlag, Berlin, Germany, 1988.

[774] D. Stipp. AT & T problem–solving math procedure passes early tests of its practical value. *The Wallstreet Journal*, March 5 1985.

[775] J. Stoer. Complexity bounds for interior point methods to solve linear programs. Talk held at the Symposium on Mathematical Programming in Oberwolfach, Germany, Institut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, West-Germany, January 1990.

[776] J. Stoer. Innere–Punkte–Verfahren und ihre Komplexität (Interior point methods and their complexity). Talk held at the DGOR–Jahrestagung in Vienna, Austria, Institut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, August 1990.

[777] R. E. Stone. Karmarkar's algorithm. Unpublished Report, Graduate School of Business Administration, Harvard University, Boston, MA 02163, USA, 1985.

[778] R. E. Stone and C. A. Tovey. Karmarkar's algorithm as a generalization of simplex. Talk held at the ORSA/TIMS Joint National Meeting in Los Angeles, CA, USA, Graduate School of Business Administration, Harvard University, Boston, MA 02163, USA, April 1986.

[779] R. E. Stone and C. A. Tovey. The simplex and projective scaling algorithms as iteratively reweighted least squares methods. *SIAM Review*, 33(2):220–237, June 1991. Errata in *SIAM Review* 33(3):461, September 1991.

[780] R. E. Stone and M. H. Wright. Recent developments in linear and nonlinear programming. Short Course held at the Third SIAM Conference on Optimization in Boston, MA, USA, Graduate School of Business Administration, Harvard University, Boston, MA 02163, USA, April 1989.

[781] G. Strang. Karmarkar's algorithm in a nutshell. *SIAM News*, 18(6):13, November 1985.

[782] G. Strang. *Introduction to Applied Mathematics*, chapter 8.2 : The simplex method and Karmarkar's method, pages 673–689. Wellesley–Cambridge–Press, Cambridge, MA, USA, 1986.

[783] G. Strang. Karmarkar's algorithm and its place in applied mathematics. *The Mathematical Intelligencer*, 9(2):4–10, 1987.

[784] J. Sun. An affine–scaling method for linearly constrained convex programs. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Dept. of Industrial Engineering and Management Science, Northwestern University, Evanston, IL 60208, USA, May 1991.

[785] E. R. Swart. How I implemented the Karmarkar algorithm in one evening. *APL Quote Quad*, 15(3):13–16, 1985.

[786] E. R. Swart. A modified version of the Karmarkar algorithm. Research Report in Mathematics 98, Dept. of Mathematics and Statistics, University of Guelph, Guelph, Ontario N1G 2W1, Canada, 1985.

[787] D. Tachat. *Methodes intérieures en programmation linéaire : Elaboration et mise en oeuvre de procédures de projection exacte et approchée English: Elaboration and performance of exact and approximate projection procedures.* PhD thesis, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, 1991. (In French).

[788] A. Tamura, H. Takehara, K. Fukuda, S. Fujishige, and M. Kojima. A dual interior primal simplex method for linear programming. *Journal of the Operations Research Society of Japan*, 31:413–429, 1988.

[789] T. E. Tamura. Characteristics of Karmarkar method compared with Simplex method. *Bulletin of Nagoya Institute of Technology (Nagoya, Japan)*, 38:251–256, 1986. (In Japanese).

[790] K. C. Tan and R. M. Freund. Newton's method for general parametric center problem with applications. Technical Report RR 457, Dept. of Mathematics, National University of Singapore, Singapore, India, 1991.

[791] K. Tanabe. Center flattening transformation and a centered Newton method for linear programming. Technical Report, The Institute of Statistical Mathematics, 4-6-7 Minami Azabu, Minatoku, Tokyo 106, Japan, 1987.

[792] K. Tanabe. Complementarity–enforced centered Newton method for mathematical programming. In K. Tone, editor, *New Methods for Linear Programming*, pages 118–144, The Institute of Statistical Mathematics, 4-6-7 Minami Azabu, Minatoku, Tokyo 106, Japan, 1987.

[793] K. Tanabe. Centered Newton method for mathematical programming. In M. Iri and K. Yajima, editors, *System Modelling and Optimization : Proceedings of the 13th IFIP Conference, Tokyo, Japan, Aug./Sept. 1987*, volume 113 of *Lecture Notes in Control and Information Sciences*, pages 197–206. Springer-Verlag, Berlin, Germany, 1988.

[794] K. Tanabe. Centered Newton method for linear programming exterior point method. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, The Institute of Statistical Mathematics, 4-6-7 Minami Azabu, Minatoku, Tokyo 106, Japan, January 1990.

[795] K. Tanabe and T. Tsuchiya. Global analysis of dynamical systems associated with Karmarkar's method for linear programming. *Proceedings of the Annual Meeting of the Operations Research Society of Japan*, pages 132–133, 1987.

[796] R. A. Tapia. Current research in numerical optimization. *SIAM News*, 20:10–11, March 1987.

[797] R. A. Tapia. Accelerating interior–point methods. Talk held at the Symposium on Mathematical Programming in Oberwolfach, Germany, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, January 1990.

[798] R. A. Tapia and Y. Zhang. A fast optimal basis identification technique for interior point linear programming methods. Technical Report TR–89–01, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, April 1989. Revised September 1990.

[799] R. A. Tapia and Y. Zhang. Accelerating the convergence of interior point methods. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, July 1990.

[800] R. A. Tapia and Y. Zhang. A cubically convergent method for locating a nearby vertex in linear programming. *Journal of Optimization Theory and Applications*, 67:217–225, 1990.

[801] R. A. Tapia and Y. Zhang. An optimal–basis identification technique for interior–point linear programming algorithms. *Linear Algebra and Its Applications*, 152:343–363, 1991.

[802] R. A. Tapia and Y. Zhang. A polynomial and superlinearly convergent primal–dual interior algorithm for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, May 1991.

[803] R. A. Tapia, Y. Zhang, M. Saltzman, and R. Weiser. The predictor–corrector interior–point method as a composite Newton method. Technical Report TR 90–06, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, 1990.

[804] M. J. Todd. A review of N. Karmarkar. *Computing Reviews*, 27:95–96, March 1986.

[805] M. J. Todd. The effects of degeneracy and sparsity on Karmarkar's projective algorithm and its variants. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1988.

[806] M. J. Todd. Exploiting special structure in Karmarkar's algorithm for linear programming. *Mathematical Programming*, 41:97–113, 1988.

[807] M. J. Todd. Improved bounds and containing ellipsoids in Karmarkar's linear programming algorithm. *Mathematics of Operations Research*, 13:650–659, 1988.

[808] M. J. Todd. Polynomial algorithms for linear programming. In H. A. Eiselt, editor, *Advances in Optimization and Control, Proceedings of the Conference "Optimization Days '86" held at Montreal, Quebec, Canada, April/May 1986*, volume 302 of *Lecture Notes in Economics and Mathematical Systems*, pages 49–66. Springer-Verlag, Berlin, Germany, 1988.

[809] M. J. Todd. Anticipated behavior of Karmarkar's algorithm. Technical Report 879, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, December 1989.

[810] M. J. Todd. On Anstreicher's combined phase I – phase II projective algorithm for linear programming. Technical Report 776, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1989. To appear in *Mathematical Programming*.

[811] M. J. Todd. Probabilistic models in linear programming. Technical Report 836, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1989. To appear in *Mathematics of Operations Research*.

[812] M. J. Todd. Recent developments and new directions in linear programming. In M. Iri and K. Tanabe, editors, *Mathematical Programming : Recent Developments and Applications*, pages 109–157. Kluwer Academic Press, Dordrecht, The Netherlands, 1989.

[813] M. J. Todd. Anticipated behavior of interior point methods for linear programming. Talk held at the Symposium on Mathematical Programming in Oberwolfach, Germany, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, January 1990.

[814] M. J. Todd. Combining phase I and phase II in a potential reduction algorithm for linear programming. Technical Report 907, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, July 1990.

[815] M. J. Todd. A Dantzig–Wolfe–like variant of Karmarkar's interior–point linear programming algorithm. *Operations Research*, 38:1006–1018, 1990.

[816] M. J. Todd. The effects of degeneracy, null and unbounded variables on variants of Karmarkar's linear programming algorithm. In T. F. Coleman and Y. Li, editors, *Large–Scale Numerical Optimization, Papers from the Workshop held at Cornell University, Ithaca, NY, USA, October 1989*, volume 46 of *SIAM Proceedings in Applied Mathematics*, pages 81–91. Society of Industrial and Applied Mathematics (SIAM), Philadelphia, PA, USA, 1990.

[817] M. J. Todd. A low complexity interior point algorithm for linear programming. Technical Report 903, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, April 1990. Revised August 1990.

[818] M. J. Todd. Projected scaled steepest descent in Kojima–Mizuno–Yoshise's potential reduction algorithm for the linear complementarity problem. Technical Report 950, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, December 1990.

[819] M. J. Todd. The affine–scaling direction for linear programming is a limit of projective–scaling directions. *Linear Algebra and Its Applications*, 152:93–105, 1991.

[820] M. J. Todd. Playing with interior points. *COAL Newsletter*, 19:17–25, August 1991.

[821] M. J. Todd and B. P. Burrell. An extension of Karmarkar's algorithm for linear programming using dual variables. *Algorithmica*, 1(4):409–424, 1986.

[822] M. J. Todd and C. C. Gonzaga. An $O(\sqrt{n}L)$–iteration large–step primal–dual affine algorithm for linear programming. Talk held at the First International Symposium on Interior Point Methods for Linear Programming : Theory and Practice, in Scheveningen, The Netherlands, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, January 1990.

[823] M. J. Todd, S. Mizuno, and Y. Ye. Anticipated behavior of path–following algorithms for linear programming. Talk held at the Second Asilomar Workshop on Progress in Mathematical Programming, Asilomar, CA, USA, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, February 1990.

[824] M. J. Todd and J. P. Vial. Todd's low–complexity algorithm is a predictor–corrector path–following method. Technical Report 952, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, December 1990.

[825] M. J. Todd and Y. Wang. On combined phase I – phase II projective methods for linear programming. Technical Report 877, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, December 1989. To appear in *Algorithmica*.

[826] M. J. Todd and Y. Wang. A projective algorithm for convex quadratic programming. Technical Report, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY 14853, USA, 1991.

[827] M. J. Todd and Y. Ye. A centered projective algorithm for linear programming. *Mathematics of Operations Research*, 15:508–529, 1990.

[828] P. Tolla. Amelioration des performances de l'algorithme de Karmarkar dans le cas de programmes lineaires a variables bornees superieurement (Improving the performance of Karmarkar's algorithm in linear programs with upper bounded variables). Cahier 82, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, November 1987. (In French).

[829] P. Tolla. Validation numerique de l'algorithme de Karmarkar (Numerical validation of Karmarkar's algorithm). Cahier 76, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, April 1987. (In French).

[830] P. Tolla. New numerical results on Karmarkar's algorithm. Cahier, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, 1988.

[831] P. Tolla. Elaboration de logiciels efficaces utilisant l'algorithme de Karmarkar (Elaboration of a computationally efficient utilization of Karmarkar's algorithm). In J. P. Penot, editor, *New Methods in Optimization and Their Industrial Uses*, volume 87 of *International Series of Numerical Mathematics*, pages 173–190. Birkhäuser Verlag, Basel, Switzerland, 1989. (In French).

[832] P. Tolla. Optimal criterion and optimal solution accuracy test in Karmarkar's algorithm. In C. Brezinski, editor, *Numerical and Applied Mathematics, Part II. Papers from the Twelfth IMACS World Congress*

on Scientific Computation in Paris, France, July 1988, volume 1.2 of *IMACS Annals of Computational and Applied Mathematics*, pages 629–633. Baltzer Verlag, Basel, Switzerland, 1989.

[833] P. Tolla. Implementation and validation of interior point methods for linear programming. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Laboratoire de Analyse et Modelisation de Systemes pour l'Aide a la Decision (LAMSADE), Universite de Paris Dauphine, F-75775 Paris Cedex 16, France, July 1991.

[834] J. A. Tomlin. Experimental results with an implementation of the projective method. Spring 1985.

[835] J. A. Tomlin. An experimental approach to Karmarkar's projective method for linear programming. *Mathematical Programming Study*, 31:175–191, 1987.

[836] J. A. Tomlin. A note on comparing simplex and interior methods for linear programming. In N. Megiddo, editor, *Progress in Mathematical Programming : Interior Point and Related Methods*, pages 91–104. Springer-Verlag, New York, NY, USA, 1989.

[837] J. A. Tomlin and J. S. Welch. Implementing an interior point method in a mathematical programming system : Part I. Technical Report, Ketron Management Science, Inc., Mountain View, CA 94040, USA, 1986.

[838] J. A. Tomlin and J. S. Welch. Implementing an interior point method in a mathematical programming system : Part II. Technical Report, Ketron Management Science, Inc., Mountain View, CA 94040, USA, 1987.

[839] C. B. Tompkins. Projection methods in calculation. In H. A. Antosiewicz, editor, *Proceedings of the Second Symposium in Linear Programming*, pages 425–448, U. S. Air Force, Washington, DC, USA, 1955.

[840] C. B. Tompkins. Some methods of computational attack on programming problems, other than the simplex method. *Naval Research Logistics Quarterly*, 4:95–96, 1957.

[841] K. Tone. A hybrid method for linear programming. Technical Report 85–B–1, Graduate School for Policy Science, Saitama University, Urawa, Saitama 338, Japan, 1985.

[842] K. Tone. An implementation of a revised Karmarkar method. Technical Report, Graduate School for Policy Science, Saitama University, Urawa, Saitama 338, Japan, 1986/87.

[843] K. Tone. An $O(\sqrt{n}L)$ iteration large–step logarithmic barrier function algorithm for linear programming. Research Report 89–B–5, Graduate School for Policy Science, Saitama University, Urawa, Saitama 338, Japan, 1989.

[844] K. Tone. Linear programming and Karmarkar patents. *Systems, Control and Information*, 34(5):209–215, April 1990. (In Japanese).

[845] K. Tone. An active–set strategy in interior point method for linear programming. Working Paper, Graduate School for Policy Science, Saitama University, Urawa, Saitama 338, Japan, 1991.

[846] M. Torabi. Decomposed block Cholesky factorization in the Karmarkar algorithm : A proposed scheme for solving a class of super large LP problems. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, May 1990.

[847] M. Torabi. Decomposed block Cholesky factorization in the Karmarkar algorithm. Solving a class of super large LP problems. *Computers and Mathematics with Applications*, 20(2):1–7, 1990.

[848] C. A. Tovey. Integrating Karmarkar's algorithm into the curriculum. Workshop held at the ORSA/TIMS Joint National Meeting in Miami Beach, FL, USA, School of Industrial and Systems Engineering, Georgia Technology Institute, Atlanta, GA 30322-0205, USA, October 1986.

[849] C. A. Tovey. The challenge : Teaching Karmarkar's algorithm. *OR/MS Today*, 15(2):18–19, April 1988.

[850] T. B. Trafalis. *Efficient faces of a polytope : Interior methods in multiple objective optimization.* PhD thesis, Dept. of Mathematics and Computer Science, School of Industrial Engineering, Purdue University, West Lafayette, IN 47907, USA, August 1989.

[851] T. B. Trafalis. Interior point methods in backpropagation neural networks. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, School of Industrial Engineering, University of Oklahoma, Norman, OK 73019, USA, November 1991.

[852] T. B. Trafalis and T. L. Morin. Interior point methods in multiobjective convex optimization. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, School of Industrial Engineering, University of Oklahoma, Norman, OK 73019, USA, July 1991.

[853] P. Tseng. A simple complexity proof for a polynomial–time linear programming algorithm. *Operations Research Letters*, 8:155–159, 1989.

[854] P. Tseng. Global linear convergence of a path following algorithm for some variational inequality problems. Working Paper, Dept. of Mathematics, GN–50, University of Washington, Seattle, WA, USA, 1990.

[855] P. Tseng and Z. Q. Luo. On the convergence of the affine–scaling algorithm. Technical Report CICS–P–169, Center for Intelligent Control Systems, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, 1989.

[856] T. Tsuchiya. Dual standard form linear programming problems and Karmarkar's canonical form. *Lecture Note of the Research Institute of Statistical Mathematics*, 676:330–336, 1988. (In Japanese).

[857] T. Tsuchiya. On Yamashita's method and Freund's method for linear programming. *Cooperative Research Report of the Institute of Statistical Mathematics*, 10:105–115, 1988. (In Japanese).

[858] T. Tsuchiya. Global convergence of the affine–scaling methods for degenerate linear programming problems. Research Memorandum 373, The Institute of Statistical Mathematics, 4-6-7 Minami-Azabu, Minato-ku, Tokyo 106, Japan, 1989. Revised January 1991. To appear in *Mathematical Programming, Series B, 1991*.

[859] T. Tsuchiya. Global convergence property of the affine scaling method for primal degenerate linear programming problems. Research Memorandum 367, The Institute of Statistical Mathematics, 4-6-7 Minami-Azabu, Minato-ku, Tokyo 106, Japan, August 1989. Revised September 1990. To appear in *Mathematics of Operations Research*.

[860] T. Tsuchiya. Degenerate linear programming problems and the affine scaling method. *Systems, Control and Information*, 34(5):216–222, April 1990. (In Japanese).

[861] T. Tsuchiya. Local analysis of Iri and Imai's method for degenerate linear programming problems. Research Memorandum (in preparation), The Institute of Statistical Mathematics, 4-6-7 Minami-Azabu, Minato-ku, Tokyo 106, Japan, 1991.

[862] T. Tsuchiya. Quadratic convergence of Iri and Imai's method for degenerate linear programming problems. Research Memorandum 412, The Institute of Statistical Mathematics, 4-6-7 Minami-Azabu, Minato-ku, Tokyo 106, Japan, 1991.

[863] T. Tsuchiya. *A study on global and local convergence of interior point algorithms for linear programming*. PhD thesis, Faculty of Engineering, The University of Tokyo, Tokyo, Japan, 1991. (In Japanese).

[864] T. Tsuchiya and K. Tanabe. Local convergence properties of new methods in linear programming. *Journal of the Operations Research Society of Japan*, 33:22–45, 1990.

[865] K. Turner. A variable metric variant of the Karmarkar algorithm for linear programming. Technical Report TR–87–13, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, 1987.

[866] K. Turner. Computing projections for the Karmarkar algorithm. *Linear Algebra and Its Applications*, 152:141–154, 1991.

[867] P. M. Vaidya. Linear programming and the center of a polytope. Technical Report, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1988.

[868] P. M. Vaidya. A locally well–behaved potential function and a simple Newton–type method for finding the center of a polytope. In N. Megiddo, editor, *Progress in Mathematical Programming : Interior Point and Related Methods*, pages 79–90. Springer-Verlag, New York, NY, USA, 1989.

[869] P. M. Vaidya. An algorithm for linear programming which requires $O((m+n)n^2 + (m+n)^{1.5}nL)$ arithmetic operations. *Mathematical Programming*, 47:175–201, 1990. Condensed version in : *Proceedings of the 19th Annual ACM Symposium on Theory of Computing*, pages 29–38, 1987.

[870] P. M. Vaidya. A new algorithm for minimizing a convex function over convex sets. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1990.

[871] P. M. Vaidya. A new algorithm for minimizing a convex function over convex sets. In *Proceedings of the 30th Annual Symposium on Foundations of Computer Science, Research Triangle Park, NC, USA, 1989*, pages 338–343. IEEE Computer Society Press, Los Alamitos, CA, USA, 1990.

[872] P. M. Vaidya. Reducing the parallel complexity of certain linear programming problems. In *Proceedings of the 31st Annual Symposium on Foundations of Computer Science, St. Louis, MO, USA, October 1990*, pages 583–589. IEEE Computer Society Press, Los Alamitos, CA, USA, 1990.

[873] P. M. Vaidya. Speeding–up linear programming using fast matrix multiplication. In *Proceedings of the 30th Annual Symposium on Foundations of Computer Science, Research Triangle Park, NC, USA, 1989*, pages 332–337. IEEE Computer Society Press, Los Alamitos, CA, USA, 1990.

[874] R. J. Vanderbei. A rescaled orthant variant of Karmarkar's algorithm. Technical Report, AT & T Bell Laboratories, Holmdel, NJ 07733, USA, 1986.

[875] R. J. Vanderbei. The affine–scaling algorithm and primal degeneracy. Talk held at the Second Asilomar Workshop on Progress in Mathematical Programming, Asimolar Conference Center, Pacific Grove, CA, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1987.

[876] R. J. Vanderbei. Methods and apparatus for efficient resource allocation. U.S. Patent No. 4.744.026, 1988. AT & T Bell Laboratories, Murray Hill, NJ 07974, USA.

[877] R. J. Vanderbei. Affine–scaling for linear programs with free variables. *Mathematical Programming*, 43:31–44, 1989.

[878] R. J. Vanderbei. New developments in the affine–scaling algorithm for LP. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, October 1989.

[879] R. J. Vanderbei. A brief description of ALPO. Technical Report, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1990. To appear in *Operations Research Letters, 1991*.

[880] R. J. Vanderbei. ALPO : Another linear program solver. Manuscript, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, 1990. Revised May 1991, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA.

[881] R. J. Vanderbei. Performance of the AT & T KORBX System. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, May 1990.

[882] R. J. Vanderbei. Dense columns and interior–point methods for LP. Manuscript, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, 1991.

[883] R. J. Vanderbei. Efficient handling of dense columns in linear and quadratic programs. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, AT & T Bell Laboratories, 10 Knob Hill Road, Morganville, NJ 07751, USA, July 1991.

[884] R. J. Vanderbei. Splitting dense columns in sparse linear systems. *Linear Algebra and Its Applications*, 152:107–117, 1991.

[885] R. J. Vanderbei. Symmetric quasi–definite matrices. Technical Report SOL 91–10, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, 1991.

[886] R. J. Vanderbei and T. J. Carpenter. Symmetric indefinite systems for interior point methods. Technical Report SOR 91–7, Dept. of Civil Engineering and Operations Research, Princeton University, Princeton, NJ 08544, USA, 1991.

[887] R. J. Vanderbei and J. C. Lagarias. I. I. Dikin's convergence result for the affine–scaling algorithm. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 109–119. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[888] R. J. Vanderbei, M. S. Meketon, and B. A. Freedman. A modification of Karmarkar's linear programming algorithm. *Algorithmica*, 1(4):395–407, 1986.

[889] A. Vannelli. An interior point method for solving the global routing problem. In *Proceedings of the IEEE Custom Integrated Circuits Conference, San Diego, CA, USA, May 1988*, pages 3.4.1–3.4.4, 1989.

[890] A. Vannelli. An adaptation of the interior point method for solving the global routing problem. *IEEE Transactions on Computer–Aided Design of Integrated Circuits and Systems*, 10(2):193–203, February 1991.

[891] A. Vannelli and E. Klein. A Cholesky–conjugate gradient implementation of Karmarkar's algorithm. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, Faculty of Engineering, Dept. of Electrical Engineering, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada, April 1988.

[892] V. C. Venkaiah. An efficient algorithm for linear programming. *Proceedings of the Indian Academy of Sciences, Mathematical Sciences*, 100:205–301, 1990.

[893] J. P. Vial. A fully polynomial-time projective method. *Operations Research Letters*, 7:15–19, 1988.

[894] J. P. Vial. Approximate projections in a projective method for the linear feasibility problem. In N. Megiddo, editor, *Progress in Mathematical Programming : Interior Point and Related Methods*, pages 65–78. Springer-Verlag, New York, NY, USA, 1989.

[895] J. P. Vial. A unified approach to projective algorithms for linear programming. In S. Dolecki, editor, *Optimization : Proceedings of the 5th French–German Conference in Castel–Novel, Varetz, France, October 1988*, volume 1405 of *Lecture Notes in Mathematics*, pages 191–220. Springer-Verlag, Berlin, Germany, 1989.

[896] J. P. Vial. Decomposition of structured linear programs based on analytic centers. volume 353 of *Lecture Notes in Economics and Mathematical Systems*, pages 190–203. Springer-Verlag, Berlin, Germany, 1991.

[897] J. G. G. van de Vorst. An attempt to use parallel computing in large scale optimisation. In C. F. H. van Rijn, editor, *Logistics, Where Ends Have to Meet : Proceedings of the Shell Conference on Logistics in Apeldoorn, The Netherlands, November 1988*, pages 112–119. Pergamon Press, Oxford, United Kingdom, 1989.

[898] V. Vucetic. Active set strategies in linear programming using barrier functions. Talk held at the TIMS/SOBRAPO Joint International Meeting in Rio de Janeiro, Brazil, Energoinvest–Sou, Tvornicka 3, YU-71000 Sarajevo, Yugoslavia, July 1991.

[899] A. Wanka. Interior and exterior methods for linear programming. In D. Pressmar, K. E. Jaeger, H. Krallmann, H. Schellhaas, and L. Streitfeldt, editors, *Operations Research Proceedings 1988*, pages 214–221, Springer-Verlag, Berlin, Germany, 1989.

[900] Z. L. Wei. An exact solution to linear programming using an interior point method. *Journal of Computational Mathematics*, 5:264–271, 1987.

[901] Z. L. Wei. An interior point method for linear programming. *Journal of Computational Mathematics*, 5:342–351, 1987.

[902] Z. L. Wei. Some recent developments in linear programming. *Mathematics in Practice and Theory*, 3:82–89, 1988. (In Chinese).

[903] J. Werner. *Numerische Mathematik 2 (Numerical Mathematics 2)*, chapter 6.4 : Das Karmarkar Verfahren (The Karmarkar algorithm), pages 128–141. Vieweg Verlag, Braunschweig, Germany, 1992.

[904] A. W. Whisman. Optimization modelling in the military airlift command. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, CINCMAC Analysis Group, HQ MAC/AG, Scott AFB, IL 62225, USA, May 1990.

[905] D. J. White. Linear programming and Huard's method of centres. Working Paper, Universities of Manchester and Virginia, Manchester, United Kingdom, 1989.

[906] R. O. Williams. An implementation of the affine scaling algorithm for linear programming problems with network constraints. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Dept. of Management Science, California State University, Northridge, Los Angeles, CA 90024, USA, November 1991.

[907] J. Wilson. A barrier function approach to mixed integer programming. Talk held at the Symposium APMOD '91—Applied Mathematical Programming and Modelling, Brunel University, London, UK, Loughborough University, Loughborough, UK, January 1991.

[908] C. Witzgall, P. T. Boggs, and P. D. Domich. On the convergence behavior of trajectories for linear programming. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA, June/July 1988*, volume 114 of *Contemporary Mathematics*, pages 161–187. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[909] C. Witzgall, P. T. Boggs, and P. D. Domich. On center trajectories and their relatives in linear programming. NISTIR Technical Report (in preparation), United States Department of Commerce, Applied and Computational Mathematics Division, National Institute of Standards and Technology, Gaithersburg, MD 20899, USA, 1991. First draft in April 1988.

[910] H. Wolkowicz and A. Ben–Israel. A volume and constraint reducing algorithm for linear programming. Technical Report, Dept. of Combinatorics and Optimization, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada, 1986.

[911] M. H. Wright. A brief history of linear programming. *SIAM News*, 18(3):4, November 1985.

[912] M. H. Wright. Issues of numerical analysis in barrier trajectory methods. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, October 1989.

[913] M. H. Wright. Interior methods for nonlinearly constrained optimization. Talk held at the SIAM Annual Meeting in Chicago, IL, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, July 1990.

[914] M. H. Wright. Strategies in path–following methods for nonlinear constraints. Talk held at the ORSA/TIMS Joint National Meeting

in Philadelphia, PA, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, October 1990.

[915] M. H. Wright. Interior methods for constrained optimization. Numerical Analysis Manuscript 91–10, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, November 1991.

[916] M. H. Wright. Linear algebra issues in interior methods. Talk held at the Fourth SIAM Conference on Applied Linear Algebra in Minneapolis, MN, USA, AT & T Bell Laboratories, Murray Hill, NJ 07974, USA, September 1991.

[917] S. J. Wright. An interior point algorithm for linearly constrained optimization. Technical Report MCS–P162–0790, Mathematical and Computer Science Division, Argonne National Laboratory, Argonne, IL 60439, USA, July 1990.

[918] D. Xiao. Fractional linear functions and the analysis of variants of Karmarkar's method. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, October 1989.

[919] D. Xiao and D. Goldfarb. A primal projective interior point method for linear programming. Talk held at the CORS/ORSA/TIMS Joint National Meeting in Vancouver, British Columbia, Canada, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, May 1989.

[920] D. Xiao and D. Goldfarb. A path–following projective interior point method for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, October 1990.

[921] D. Xiao and D. Goldfarb. On the complexity of a class of projective interior point methods. Talk held at the ORSA/TIMS Joint National Meeting in Anaheim, CA, USA, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, November 1991.

[922] H. Yamashita. A polynomially and quadratically convergent method for linear programming. Working Paper, Mathematical Systems Institute, Inc., Tokyo, Japan, 1986.

[923] H. Yamashita. A class of primal dual method for constrained optimization. Working Paper, Mathematical Systems Institute, Inc., Tokyo, Japan, 1991.

[924] E. K. Yang and W. S. Hwang. An interior point method for dynamic Leontief type linear programs. Talk held at the ORSA/TIMS Joint National Meeting in Las Vegas, NV, USA, Institute of Applied Mathematics, Tsing Hua University, Hsinchu, 30043, People Republic of China, May 1990.

[925] Y. Ye. Barrier projection and sliding current objective method for linear programming. Talk held at the 12th Mathematical Programming Symposium, Boston, MA, USA, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, 1985.

[926] Y. Ye. Cutting–objective and scaling methods—a polynomial algorithm for linear programming. Working Paper, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, 1985. Submitted to *Mathematical Programming*.

[927] Y. Ye. Cutting current–objective method in projective algorithm for linear programming. Working Paper, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, February 1985.

[928] Y. Ye. K–projection and cutting–objective method for linear programming. Talk held at the 12th Mathematical Programming Symposium, Boston, MA, USA, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, 1985.

[929] Y. Ye. A large group of projections for linear programming. Working Paper, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, 1985.

[930] Y. Ye. A 'build-down' simplex — Karmarkar method for linear programming. Technical Report, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, 1987.

[931] Y. Ye. Dual approach of Karmarkar's algorithm and the ellipsoid method. Working Paper, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, 1987.

[932] Y. Ye. Further development on the interior algorithm for convex quadratic programming. Working Paper, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, 1987.

[933] Y. Ye. *Interior algorithms for linear, quadratic, and linearly constrained convex programming.* PhD thesis, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, 1987.

[934] Y. Ye. Karmarkar's algorithm and the ellipsoid method. *Operations Research Letters*, 6:177–182, 1987.

[935] Y. Ye. Bimatrix equilibrium points and potential functions. Technical Report, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1988.

[936] Y. Ye. The 'build-down' scheme for path-following algorithms. Technical Report, Integrated Systems Inc., Santa Clara, CA, USA, 1988.

[937] Y. Ye. A class of potential functions for linear programming. Management Science Working Paper 88–13, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1988.

[938] Y. Ye. A further result on the potential reduction algorithm for the P–matrix linear complementarity problem. Working Paper, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1988.

[939] Y. Ye. On an affine scaling algorithm for nonconvex quadratic programming. Technical Report, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, April 1988. Revised July 1989.

[940] Y. Ye. On the interior algorithms for nonconvex quadratic programming. Manuscript, Integrated Systems, Inc., Santa Clara, CA, USA, 1988.

[941] Y. Ye. A combinatorial property of analytic centers of polytopes. Technical Report, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1989.

[942] Y. Ye. Eliminating columns and rows in potential reduction and path–following algorithms for linear programming. Working Paper Series 89–7, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1989.

[943] Y. Ye. An extension of Karmarkar's algorithm and the trust region method for quadratic programming. In N. Megiddo, editor, *Progress in Mathematical Programming : Interior Point and Related Methods*, pages 49–64. Springer-Verlag, New York, NY, USA, 1989.

[944] Y. Ye. Further developments in potential reduction algorithm. Technical Report, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1989.

[945] Y. Ye. Interior point algorithms for quadratic programming. Working Paper Series 89–29, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1989. To appear in S. Kumar, editor, *Recent Developments in Mathematical Programming*, Gordon & Beach Scientific Publishers, 1991.

[946] Y. Ye. Line searches in potential reduction algorithm for linear programming. Manuscript, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1989.

[947] Y. Ye. Potential functions and polytopes. Talk held at the ORSA/TIMS Joint National Meeting in New York, NY, USA, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, October 1989.

[948] Y. Ye. A potential reduction algorithm allowing column generation. Working Paper, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1989.

[949] Y. Ye. Anticipated behavior of affine scaling algorithms for linear programming. Technical Report, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1990.

[950] Y. Ye. A 'build-down' scheme for linear programming. *Mathematical Programming*, 46:61–72, 1990.

[951] Y. Ye. A class of projective transformations for linear programming. *SIAM Journal on Computing*, 19:457–466, 1990.

[952] Y. Ye. Comparative analysis of affine scaling algorithms based on simplifying assumptions. Technical Report, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, January 1990. Revised November 1990. To appear in *Mathematical Programming, Series B, 1991*.

[953] Y. Ye. Complexity analysis on Karmarkar's algorithm. Manuscript, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1990.

[954] Y. Ye. Interior point algorithms for global optimization. *Annals of Operations Research*, 25:59–74, 1990.

[955] Y. Ye. An $O(n^3 L)$ potential reduction algorithm for linear programming. In J. C. Lagarias and M. J. Todd, editors, *Mathematical Developments Arising from Linear Programming : Proceedings of a Joint Summer Research Conference held at Bowdoin College, Brunswick, Maine, USA,*

June/July 1988, volume 114 of *Contemporary Mathematics*, pages 77–88. American Mathematical Society, Providence, Rhode Island, USA, 1990.

[956] Y. Ye. Recovering optimal basic variables in Karmarkar's polynomial algorithm for linear programming. *Mathematics of Operations Research*, 15:564–572, 1990.

[957] Y. Ye. A fully polynomial–time approximation algorithm for computing a stationary point of the generalized linear complementarity problem. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, May 1991.

[958] Y. Ye. On the finite convergence of interior–point algorithms for linear programming. Technical Report 91–05, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1991.

[959] Y. Ye. An $O(n^3L)$ potential reduction algorithm for linear programming. *Mathematical Programming*, 50:239–258, 1991.

[960] Y. Ye. Toward probabilistic analysis of interior–point algorithms for linear programming. Working Paper Series 91–13, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1991.

[961] Y. Ye. The potential algorithm for linear complementarity problems. Technical Report, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1998.

[962] Y. Ye and S. S. Chiu. Recovering the shadow price in projection methods for linear programming. Technical Report, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1985.

[963] Y. Ye, O. Güler, R. A. Tapia, and Y. Zhang. A quadratically convergent $O(\sqrt{n}L)$–iteration algorithm for linear programming. Technical Report TR–91–26, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, August 1991.

[964] Y. Ye and J. A. Kaliski. Further results on build–up approaches for linear programming. Talk held at the ORSA/TIMS Joint National Meeting in, Anaheim, CA, USA, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, November 1991.

[965] Y. Ye and M. Kojima. Recovering optimal dual solutions in Karmarkar's polynomial algorithm for linear programming. *Mathematical Programming*, 39:305–317, 1987.

[966] Y. Ye, K. O. Kortanek, J. A. Kaliski, and S. Huang. Near–boundary behavior of primal–dual potential reduction algorithms for linear programming. Working Paper, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1990.

[967] Y. Ye and P. M. Pardalos. A class of linear complementarity problems solvable in polynomial time. *Linear Algebra and Its Applications*, 152:3–17, 1991.

[968] Y. Ye and F. A. Potra. An interior–point algorithm for solving entropy optimization problems with globally linear and locally quadratic convergence rate. Working Paper Series 90–22, Dept. of Management Science, University of Iowa, Iowa City, IA 52242, USA, 1990.

[969] Y. Ye, R. A. Tapia, and Y. Zhang. A superlinearly convergent $O(\sqrt{n}L)$–iteration algorithm for linear programming. Technical Report TR–91–22, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, 1991.

[970] Y. Ye and M. J. Todd. Containing and shrinking ellipsoids in the path–following algorithm. *Mathematical Programming*, 47:1–10, 1990.

[971] Y. Ye and E. Tse. A polynomial–time algorithm for convex quadratic programming. Working Paper, Dept. of Engineering Economic Systems, Stanford University, Stanford, CA 94305, USA, 1986.

[972] Y. Ye and E. Tse. An extension of Karmarkar's projective algorithm for convex quadratic programming. *Mathematical Programming*, 44:157–179, 1989.

[973] Q. J. Yeh. *A reduced dual affine scaling algorithm for solving assignment and transportation problems*. PhD thesis, Dept. of Industrial Engineering and Operations Research, Columbia University, New York, NY 10027, USA, 1989.

[974] D. Zaijan. A modified Karmarkar's algorithm. *Applied Mathematics—A Journal of Chinese Universities*, 3:41–56, 1988.

[975] J. Z. Zhang. The affine transformation method and the path following method for solving linear programming problems. *Chinese Journal of Operations Research*, 8(2):25–34, 1989. (In Chinese).

[976] S. Zhang. On the convergence property of Iri–Imai's method for linear programming. Technical Report 8917/A, Economic Institute, Erasmus University, Rotterdam, The Netherlands, 1989.

[977] Y. Zhang. Super–linear convergence of interior point algorithms for a class of mathematical programming problems. Talk held at the ORSA/TIMS Joint National Meeting in Nashville, Tennessee, USA, Dept. of Mathematics & Statistics, University of Maryland Baltimore County, Baltimore, MD 21228, USA, May 1991.

[978] Y. Zhang and R. A. Tapia. A quadratically convergent polynomial primal–dual interior–point algorithm for linear programming. Technical Report TR 90–40, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, 1990.

[979] Y. Zhang and R. A. Tapia. A polynomial–time and superlinearly convergent interior point algorithm for linear programming. Technical Report, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, March 1991.

[980] Y. Zhang, R. A. Tapia, and J. E. Dennis. On the superlinear and quadratic convergence of primal–dual interior point linear programming algorithms. Technical Report TR 90–6, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, January 1990.

[981] Y. Zhang, R. A. Tapia, and F. Potra. On the superlinear convergence of interior point algorithms for a general class of problems. Technical Report TR 90–9, Dept. of Mathematical Sciences, Rice University, Houston, TX 77251, USA, March 1990.

[982] G. Zhao and J. Stoer. Estimating the complexity of path following methods for solving linear programs by curvature integrals. Technical Report 225, Institut für Angewandte Mathematik und Statistik, Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, 1990.

[983] Q. Zheng. On the complexity of linear programming problems. *Chinese Journal of Operations Research*, 7(2):1–10, 1988. (In Chinese).

[984] J. Zhou, N. Xu, and W. Chen. Discussion on Karmarkar's method for solving unstandard model. *Journal of Southeastern University (Nanjing, PR China), English Edition*, 5(1):38–45, 1989.

[985] J. Zhu. A path following algorithm for a class of convex programming problems. Working Paper Series 90–14, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, 1990.

[986] J. Zhu and K. O. Kortanek. A polynomial path–following algorithm for linearly constrained convex programming. Talk held at the ORSA/TIMS Joint National Meeting in Philadelphia, PA, USA, College of Business Administration, University of Iowa, Iowa City, IA 52240, USA, October 1990.

[987] K. Zikan and R. W. Cottle. The box method for linear programming, part I : Basic theory. Technical Report, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305-4022, USA, 1987.

[988] K. Zikan and R. W. Cottle. The box method for linear programming, part II : Treatment of problems in standard form with explicitly bounded variables. Technical Report, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305-4022, USA, 1987.

[989] K. Zikan and R. W. Cottle. Solving linear programs with the box method. Talk held at the ORSA/TIMS Joint National Meeting in Washington, DC, USA, Systems Optimization Laboratory, Dept. of Operations Research, Stanford University, Stanford, CA 94305-4022, USA, April 1988.

[990] U. Zimmermann. On recent developments in linear programming. In K. H. Hoffmann, J. B. Hiriat-Urruty, C. Lemarechal, and J. Zowe, editors, *Trends in Mathematical Optimization : Proceedings of the 4th French–German Conference on Optimization in Irsee, Germany, April 1986*, volume 84 of *International Series of Numerical Mathematics*, pages 353–390. Birkhäuser Verlag, Basel, Switzerland, 1988.

[991] U. Zimmermann. Search directions for projective methods. Technical Report, Technische Universität Braunschweig, Institut für Angewandte Mathematik, Abt. für Math. Optimierung, Pockelstr. 14, D-3300 Braunschweig, Germany, February 1989.

[992] U. Zimmermann. Search directions for a class of projective methods. *Zeitschrift für Operations Research—Methods and Models of Operations Research*, 34:353–379, 1990.

[993] U. Zimmermann and C. Wallacher. An interior point method for flow problems. Talk held at the DGOR–Jahrestagung in Vienna, Austria, Technische Universität Braunschweig, Institut für Angewandte Mathematik, Abt. für Math. Optimierung, Pockelstr. 14, D-3300 Braunschweig, Germany, August 1990.