

Ryleigh Moore

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RESEARCH INTERESTS

Applied mathematics, numerical analysis, stochastic differential equations, algorithm development, mathematical modeling, probability theory

EDUCATION

Ph.D. Mathematics, University of Utah 2017 — Expected May 2022

M.S. Mathematics, University of Utah 2017 — 2021

B.S. Applied Mathematics, B.S. Mathematics, Boise State University 2014 — 2017

- Summa Cum Laude
- Minor: Computer Science

SELECTED WORK AND RESEARCH EXPERIENCE

Ph.D. Research: Numerical Methods for Stochastic Differential Equations Nov 2018 — Present
Dr. Akil Narayan, Department of Mathematics, Scientific Computing and Imaging Institute, University of Utah

- Developed numerical algorithms for solving high dimensional stochastic differential equations (SDEs)
- The SDE is discretized in time and viewed as a Markov chain. Quadrature is used at each time step to solve the associated Chapman-Kolmogorov equation which updates the probability density of the SDE's solution.

Ph.D. Research: Medical Applications of Mathematics Apr 2020 — Present
Dr. Robert Schmidt, Department of Pathology, University of Utah

- Developed a mathematical model to minimize the risk of blood platelet contamination during blood transfusion
- The costs and benefits of cross-level quality control rules
- An improved method to estimate the risk associated with a quality control policy using Markov processes

Ph.D. Research: Modeling Arctic Melt Pond Evolution Sep 2017 — Present
Dr. Kenneth Golden, Department of Mathematics, University of Utah

- Theory and numerical simulation of the evolution of Arctic melt pond geometry
- Mentored undergraduate and high school students in melt pond research

NSF Mathematical Sciences Graduate Internship (MSGI) Summer 2020
Marissa Torres, US Army Corps of Engineers Cold Regions Research and Engineering Lab (CRREL) — Remote due to COVID-19

- Characterization of seasonal variability in the ocean tide for storm surge modeling

MOSAic Arctic Expedition Participant Sep 2019 — Oct 2019
Association of Polar Early Career Scientists MOSAic School

- Led a team to deploy 3 seasonal ice mass balance buoys in the Central Arctic
- Worked with leading polar scientists from around the world on *Research Vessel Akademik Fedorov*
- Selected as part the MOSAic School which accepted 20 students from around the world

Industrial Math/Stat Modeling Workshop for Graduate Students Participant July 2019
SAMSI and US Army Corps of Engineers, North Carolina State University

- Worked on a team to study ocean wave breaker types using coastal imagery analysis and machine learning

Mathematics Instructor Aug 2017 — Present
Department of Mathematics, University of Utah

- MATH 1090 Business Algebra instructor — Fall 2021, Fall 2020, Fall 2018, Spring 2018
- MATH 2210 Calculus 3 teaching assistant — Fall 2019
- MATH 1080 Pre-calculus instructor — Summer 2019
- MATH 1060 Trigonometry instructor — Spring 2019
- MATH 2250 ODEs for Engineers lab instructor — Fall 2017

Reconfigurable Electronics Research

May 2015 — Oct 2015

Dr. Kris Campbell, Department of Electrical and Computer Engineering, Boise State University

- Reconfigurable electronics and electronic memory technology
- Programmed a semiconductor device parameter analyzer

Software Engineer

Sep 2013 — May 2015

Zenware Software

- Developed, tested, and worked to improve technician scheduling software
- Implemented a website examination platform for the International Detailing Association

Cancer Treatment Research

Summer 2013

Dr. Henry Charlier, Department of Biochemistry, Boise State University

- Study of Carbonyl Reductase for the use of cancer treatment

TECHNICAL SKILLS & CERTIFICATIONS

Advanced in: Python, LaTeX, MATLAB, Git
Experience using: R, Java, JavaScript, MySQL, C++, HTML

- Microsoft Office Certified — Access, Excel, Word, PowerPoint

SELECTED VOLUNTEER & SERVICE ACTIVITIES

ACCESS Program Instructor

Summer 2018, 2019

Department of Mathematics, University of Utah

- Worked on a team to plan, write course materials for, and teach mathematics for a week during a summer-long ACCESS program for first generation college women interested in STEM

MOSAIC Arctic Expedition Ambassador

November 2020 — Present

Department of Mathematics, University of Utah

- Gave numerous talks, wrote several blog posts, and gave interviews promoting Polar research and understanding of the Arctic ecosystem

Mentoring Program for Undergraduates

2018 — 2020

Department of Mathematics, University of Utah

- Co-founded and co-ran a graduate to undergraduate mentoring network

PUBLICATIONS & TECHNICAL PAPERS

1. Moore, R. A., Jones, J. B., Gollero, D., Strong, C. & Golden, K. M. Saddle Points of the Sea Ice Surface and the Fractal Geometry of Arctic Melt Ponds (2021, Submitted).
2. Moore, R. A. & Narayan, A. Adaptive Density Tracking by Quadrature for Stochastic Differential Equations. arXiv: 2105.08148 [math.NA] (2021, Submitted).
3. Moore, R. A., Schmidt, R. L. & Metcalf, R. A. In reply: Window periods for secondary bacterial culture of platelets according to FDA guidance. *Transfusion* **61**, 1343–1344. <https://doi.org/10.1111%2Ftrf.16311> (Apr. 2021).
4. Moore, R. A., Schmidt, R. L. & Metcalf, R. A. The impact of the sample time of secondary bacterial culture on the risk of exposure to contaminated platelet components: A mathematical analysis. *Transfusion* **61**, 873–882. <https://doi.org/10.1111%2Ftrf.16258> (Jan. 2021).
5. Schmidt, R. L., Moore, R. A. & Pearson, L. N. The costs and benefits of cross-level quality control rules. *Clinica Chimica Acta* **510**, 697–702. <https://doi.org/10.1016%2Fj.cca.2020.09.006> (Nov. 2020).
6. Moore, R. A. & Torres, M. Characterization of Seasonal Variability in Tides. *NSF MSGI Technical Report*. <https://www.math.utah.edu/~rmoore/NSFMSGIReport.pdf> (2020).
7. Moore, R., Tsamados, M., Vasilevich, I., Schneider, T., Craw, L., Raphael, I. & Perovich, D. Setting up the MOSAiC Distributed Network in October 2019 with Research Vessel AKADEMIK FEDOROV: Seasonal ice mass balance (SIMB3) buoys. *Reports on polar and marine research: The Expedition AF122/1*. <http://www.math.utah.edu/~rmoore/MOSAICCruiseReport.pdf> (2020).
8. Arce-Garro, J., Cho, T., Lee, H. R. L., Moore, R., Sayre, R. R., Xuan, Y. & Zhou, Z. Coastal Imagery Analysis and Breaking Wave Type Estimation with Machine Learning. *Twenty-fifth Mathematical and Statistical Modeling Workshop for Graduate Students*. <https://projects.ncsu.edu/crsc//reports/ftp/pdf/crsc-tr20-01.pdf> (2019).