Gregory A. Handy

Contact information

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Research interests

Applied mathematics, mathematical biology, dynamical systems, neuroscience, calcium dynamics, and stochastic processes

Education

University of Utah

Ph.D. in Mathematics, May 2019

Advisor: Alla Borisyuk

University of Michigan

M.S. in Electrical Engineering–Systems, December 2012

University of Maryland Baltimore County

B.S. in Mathematics, May 2011
Minor in computer science
Meyerhoff Scholar, President's List, Summa Cum Laude, Nominated for Valedictorian

Publications and preprints

(*co-first authors)

submitted

G Handy, SD Lawley, A Borisyuk. Role of trap recharge time on the statistics of captured particles. Submitted.

2018

7. **G Handy**, SD Lawley, A Borisyuk. Receptor recharge time drastically reduces the number of captured particles. *PLoS Comput Biol*, 14(3), 2018.

2017

6. M Taheri*, **G Handy***, A Borisyuk, JA White. Diversity of evoked astrocyte Ca^{2+} dynamics quantified through experimental measurements and mathematical modeling. *Frontiers in Systems Neuroscience*, 11, 2017.
5. **G Handy***, M Taheri*, JA White, A Borisyuk. Mathematical investigation of IP_3-dependent calcium dynamics in astrocytes. *Journal of Computational Neuroscience*, 42(3), 2017.

2016

4. G Blanchard, M Flaska, **G Handy**, S Pozzi, C Scott. Classification with asymmetric label noise: Consistency and maximal denoising. *Electronic Journal of Statistics*, 10(2), 2016.

2013

3. C Scott, G Blanchard, **G Handy**. Classification with asymmetric label noise: Consistency and maximal denoising. *Proceedings of the 26th Annual Conference on Learning Theory, PMLR*, 30, 2013.

2012

2. **G Handy**, BE Peercy. Extending the IP_3 receptor model to include competition with partial agonists. *Journal of Theoretical Biology*, 310, 2012.

2009

1. WD Potter, E Drucker, P Bettinger, F Maier, M Martin, D Luper, M Watkinson, **G Handy**, and C Hayes. Diagnosis configuration, planning and path finding: Experiments in nature-inspired optimization. In *Natural Intelligence for Scheduling, Planning and Packing Problems*, edited by R. Chiong. Studies in Computational Intelligence, vol 250. Springer, Berlin, Heidelberg, 2009.

Invited Talks and Conference Presentations

Influence of Trap Recharge on the Statistics of Captured Particles (poster)
SIAM Conference on the Life Sciences — August 2018
Minneapolis, Minnesota

Investigation of Calcium Dynamics in Astrocytes via Bifurcation Analysis
MAA MathFest — August 2018
Denver, Colorado

Influence of Trap Recharge on the Statistics of Captured Particles (poster)
Society for Mathematical Biology Annual Meeting July 2018
Sydney, Australia

Particle Diffusion and Competitive Receptor Binding (poster)
Society for Mathematical Biology Annual Meeting July 2017
Salt Lake City, UT

Mathematical Investigation of Ion Dynamics in Astrocytes and the Extracellular Space
SIAM Conference on Applications of Dynamical System May 2017
Snowbird, UT

The Role of SOC Channels and Other Calcium Fluxes in Astrocyte Calcium Signaling Investigated through Mathematical Modeling (poster)
Society for Neuroscience Annual Meeting November 2016
San Diego, CA

Investigating Experimental Variations in Astrocytes with a Mathematical Model of Calcium Dynamics (poster)
SIAM Conference on the Life Sciences July 2016
Boston, MA

Measurement and Mathematical Modeling of Calcium Signaling in Astrocytes (poster)
Gordon Research Seminar and Conference on Calcium Signaling June 2015
Newry, ME

Identifying the Role of Store-Operated Calcium Channels in Astroctyes via an Open-Cell Model (poster)
SIAM Conference on Applications of Dynamical Systems May 2015
Snowbird, UT

Algorithms for Reconstructing Images from Helical CT Scans (poster)
CIC Summer Research Opportunity Program Conference July 2010
Columbus, OH

Extending the IP3 Receptor Model to Include Competition with Partial Agonists (poster)
First Chesapeake SIAM Student Chapter Conference April 2010
Baltimore, MD

Applying Simple Genetic Algorithms to the Snake-in-the-Box Problem in Dimension 8
Summer Undergraduate Research Program Conference July 2008
Athens, GA

Honors and support

BioFire Scholar	2018
SMB Landahl Grant	2018
Outstanding Graduate Student Award (University of Utah)	2017
STEM Ambassador Program's 2017 cohort	2017
SIAM-LS16 Poster Prize Winner (Graduate Student Category)	2016
RTG Fellowship Recipient (University of Utah)	2013-2014, 2015-2016, 2017
Rackham Merit Fellowship Recipient (University of Michigan)	2011-2012
Pi Mu Epsilon	2011
Outstanding Graduating Senior in the Mathematics Department (UMBC)	2011
Phi Beta Kappa Honor Society (Fall Inductee)	2010
Outstanding Teaching Assistant in the Statistics Department (UMBC)	2010
The Honor Society of Phi Kappa Phi	2010
Golden Key International Honor Society	2009
Meyerhoff scholar (UMBC)	2007-2011

Teaching

Courses

Mathematics in Medicine, University of Utah Spring 2018

Differential Equations and Linear Algebra, University of Utah — Fall 2017

Mathematical Biology Journal Club , University of Utah — Spring 2017

Differential Equations and Linear Algebra, University of Utah — Fall 2016

Mathematics in Medicine (Lab Instructor), University of Utah — Spring 2016

The Role of Mathematics in Medicine (Teaching Assistant), University of Utah — Fall 2015

College Algebra, University of Utah — Spring 2015

Intermediate Algebra (Teaching Assistant), University of Utah — Fall 2014

Introduction to Probability and Statistics (Teaching Assistant), UMBC — Fall 2009

Introductory Physics (Learning Assistant), UMBC — Spring 2009

Precalculus Mathematics (Teaching Assistant), UMBC — Fall 2008

Mentorship

Emma Fine (University of Utah, class of 2019) — Fall 2017
Mentored a project exploring the expected number and variability of binding events with non-instantaneous recharge rates.

Daniel Griffin (Utah State University, class of 2017) — Summer 2016
Mentored a summer REU project extending a single compartment calcium model to include effects from the extracellular space and additional ionic fluxes.

Olivia Dennis (Skyline High School, class of 2015) — Spring 2015
Mentored a reading group on the textbook "Mathematical Physiology" by Dr. James Keener and Dr. James Sneyd.

Other teaching experience

Led summer qualifying exam preparatory courses for first and second year graduate students for Differential Equations (Summer 2016) and Functional Analysis (Summer 2017).

Service and Extracurricular Activities

Poster presenter at the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) Conference in Salt Lake City — October, 2017

STEM Ambassador Program's 2017 cohort — 2017

- STEMAP is a research and public engagement training program funded by the National Science Foundation.
- Attended training workshops and held engagement events, and gained experience talking about mathematics with non-scientist.
- Worked with Splore, a non-profit organization that specializes in leading accessible outdoor adventures. Participated in cross-country skiing and rock climbing trips during which I discussed the mathematical concepts that can be found in each activity, as well as my current research in mathematical neuroscience.

Graduate Student Advisory Committee, active member

- Chair of Recruitment Committee — 2016-2017
  Coordinated prospective graduate recruitment scheduling and activities.
- Retention, Promotion, and Tenure Committee — 2016-2017
  Reviewed teaching evaluations for faculty promotions.

Poster presenter at Science Day (University of Utah) — November, 2015

- Science day consists of interactive workshops providing high school students with a great look at laboratory research and career opportunities in science, math and engineering.

Professional memberships

Society for Industrial and Applied Mathematics
Society for Mathematical Biology
Mathematical Association of America
Association for Women in Mathematics