Curriculum Vitae

Joseph P. McKenna

Contact Information

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Education

8/12 - present: Ph.D. candidate in Mathematics, Florida State University, GPA: 3.9

- Research focus: Nonlinear dynamics, Mathematical Biology, Pancreatic islets and diabetes
- Relevant coursework: Partial/Ordinary/Stochastic differential equations, Numerical analysis, Monte Carlo methods, Machine learning, Computational biology

8/04 - 5/08: B.A. Mathematics, St. Mary's College of Maryland, major GPA: 3.5

- GRE: Quantitative 167 (95%), Verbal 162 (90%)

9/09 - 12/09: Graduate non-degree, University of Illinois at Chicago, GPA: 4.0

- Relevant coursework: Topology, Logic, $\LaTeX$

Publications

- J. P. McKenna, R. Dhumpa, N Mukhitov, M. G. Roper, and R. Bertram, *Glucose oscillations can activate an endogenous oscillator in pancreatic islets*, PLOS Computational Biology, Vol 12(10), 2016, pp e1005143, 10.1371/journal.pcbi.1005143
- J. P. McKenna, J. Ha, M. J. Merrins, L. S. Satin, A. Sherman, and R. Bertram, *Calcium effects on ATP production and consumption have regulatory roles on oscillatory islet activity*, Biophysical Journal, Vol 110, Feb 2016, pp 733-742, 10.1016/j.bpj.2015.11.3526
- M. J. Merrins, C. Poudel, J. P. McKenna, J. Ha, A. Sherman, R. Bertram, and L. S. Satin, *Phase analysis of metabolic oscillations and membrane potential in pancreatic islet β-cells*, Biophysical Journal, Vol 110, Feb 2016, pp 691-699, 10.1016/j.bpj.2015.12.029
- J. P. McKenna, correct solution to *More and more balls in urns* in American Mathematical Monthly, Vol 118(8), Oct 2011, pp 750-751, 10.4169/amer.math.monthly.118.08.747
- J. P. McKenna, correct solution to *Permutations with specified left-to-right maxima* in Mathematics Magazine, Vol 84(2), Apr 2011, pp 153-154, 10.4169/math.mag.84.2.150

- J. P. McKenna, correct solution to *Counting block fountains of coins* in Mathematics Magazine, Vol 83(4), Oct 2010, pp 305, 10.4169/mathmaga.83.4.0304a

Research Experience

7/16 - present: Research assistant, Florida State University

- Forming and analyzing a model of pancreatic β-cells to better understand their role in diabetes. Specifically, investigating the importance of Ca^{2+}-activation of mitochondria for maintaining normal oscillatory insulin release from β-cells. Funding from NSF grant DMS 1612193.

5/14 - 8/14: Intern in biomedical research, National Institutes of Health, Laboratory of Biological Modeling

8/07 - 5/08: Undergraduate thesis: *Regular polytopes and symmetry*, St. Mary's College of Maryland

- Wrote exposition describing rotational and reflectional symmetries of four-dimensional analogues to the Platonic solids. Created online, interactive Java applet visualizations.

Conferences and Workshops

- 5/17: Invited minisymposium talk, *State and parameter estimation in models of cellular electrical activity*, SIAM Conference on Dynamical Systems, Snowbird, UT
- 2/17: Contributed poster, *Markov chain Monte Carlo optimization for fitting excitable cell current-voltage relations to voltage clamp data*, SIAM Conference on Computational Science and Engineering, Atlanta, GA
- 11/16: Invited workshop participant, *Integrated mathematical oncology 6^{th} annual workshop: resistance*, Moffitt Cancer Center, Tampa, FL
- 10/16: Invited workshop participant, *Dynamical systems and data analysis in neuroscience: bridging the gap*, Mathematical Biosciences Institute, Columbus, OH
- 7/16: Invited minisymposium talk, *Modeling insulin and glucagon secretion and their roles in diabetes*, SIAM Annual Conference, Boston, MA
- 5/16: Contributed poster, *Reducing a conductance-based neuron model to normal form*, Biology and Medicine through Mathematics Conference, Richmond, VA
- 7/15: Invited minisymposium talk, *Modeling pancreatic islets and diabetes from the cellular level to the whole body*, Society for Mathematical Biology Annual Meeting, Atlanta, GA
- 05/15: Contributed poster, *Rescuing the Dual Oscillator Model for β-cells from inconvenient data*, Midwest Islet Club Annual Meeting, Chicago, IL
- 8/14: Invited poster, *Mathematical model of metabolic oscillations in pancreatic β-cells*, NIH Summer Intern Poster Session, Bethesda, MD

Teaching Experience

8/12 - 7/16: Graduate teaching assistant, Florida State University

- 5/16 - 7/16: *Trigonometry* proctor
- 8/15 - 5/16: *Foundations of Computational Mathematics* (graduate level) recitation instructor
- 8/15 - 12/15: *Applied Computational Mathematics* (graduate level) instructor
- 5/15 - 8/15: *Calculus II* instructor
- 1/14 - 8/15: *Calculus I* instructor
- 8/13 - 12/14: *Precalculus* instructor
- 8/12 - 5/13: *Business Calculus*, *Precalculus*, *College Algebra*, *Trigonometry*, *Liberal Arts Mathematics* proctor

8/10 - 6/12: Junior high school instructor, Peace Corps Ghana, West Africa

- 8/10 - 6/12: *Mathematics* instructor
- 8/11 - 6/12: *Information and Communications Technology*, *English* instructor

9/09 - 12/09: Tutor, Mathematical Science Learning Center, University of Illinois at Chicago

- 9/09 - 12/09: *Linear algebra*, *Calculus I & II* small-group tutor

9/07 - 5/08: Teaching assistant, St. Mary's College of Maryland

- 9/07 - 5/08: *Calculus I* recitation instructor

Work Experience

7/11 - 6/12: Community-based project manager, Peace Corps Ghana, West Africa

- Coordinated the proposal, international fundraising, construction, and regular operation of a junior high school computer lab that introduced computer-based learning to educators and students in a remote village. Resulted in the best-in-district performance on national high school entrance exams for subsequent years: 2013-16.

11/10 - 6/12: Editor, *Celebrate Languages Audio Project*, Peace Corps Ghana, West Africa

- Used Java program to automate language-learning lesson production from interviews with speakers of languages native to Ghana, West Africa.

11/08 - 3/09: Computer assembler, FreeGeek, Chicago, IL

- Assembled PCs from donated parts and installed GNU Linux to offer low-cost computing to the economically disadvantaged.

Technical Abilities

- Programming: C, C++, Fortran, Python, MATLAB, UNIX, Java, HTML, Javascript, CSS, LaTeX, XPP, AUTO
- Language: English (native), French (intermediate), Twi (intermediate)

Awards

- 4/16: Distinguished teaching assistant, Florida State University Mathematics
- 4/16: Graduate student poster contest 3rd place, Florida State University Mathematics
- 3/16: Travel award, SIAM Annual Meeting, Boston, MA
- 3/16: Travel award, Biology and Medicine through Mathematics conference, Richmond, VA
- 9/15: Travel award, Society for Mathematical Biology Annual Meeting, Atlanta, GA
- 6/15: *Evelyn and John Baugh Fund* Scholarship, Florida State University Mathematics
- 7/13 - 5/14: *Graduate Assistance in Areas of National Need* Fellow, U.S. Department of Education
- 12/05 & 5/08: Dean's List, St. Mary's College of Maryland
- 9/04 - 5/08: Presidential Scholarship, St. Mary's College of Maryland
- 6/04: Eagle Scout, Boy Scouts of America
- 5/03 & 5/04: *Magna Cum Laude*, National Latin Exam

Memberships

- 12/14: Society for Mathematical Biology
- 12/13: Pi Mu Epsilon National Honorary Mathematical Society
- 9/13: Program for Instructional Excellence, Florida State University
- 4/13: Society for Industrial and Applied Mathematics
- 6/08: Mathematical Association of America

References

Dr. Richard Bertram

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