Danielle J. Lyles, Ph.D.
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Professional Experience

I love mathematics and working with data. In my thesis work, I collected, analyzed, and modeled data relevant to my project in mathematical neuroscience. I studied pistachio tree nut production in my postdoctoral position by analyzing data and developing a mathematical model. In both cases, I built "hybrid" models that include the interplay between deterministic (predictable) and stochastic (random) processes. Most recently, I have applied machine learning methods to predict whether incoming students would pass or fail Calculus 1 at CU Boulder.

SUMMARY OF QUALIFICATIONS:
- Ph.D. in Applied Mathematics
- Mathematical Modeling, Applied Predictive Modeling, Machine Learning
- Proficient in MATLAB and Python
- Communications skills: Presenting, teaching, writing
- Vast experience with people from different backgrounds

Education

NSF Mathematical Sciences Postdoctoral Fellowship: October 2007 – October 2010
I conducted research in the area of theoretical spatial ecology, with an emphasis on the combined roles of deterministic and stochastic processes. In particular, I studied pistachio tree nut production in my by analyzing data and developing a mathematical model.
Advisor: Dr. Alan Hastings, Department of Environmental Science and Policy, UC Davis

Ph.D., Applied Mathematics, Cornell University, 2008
Concentrations: Mathematics and Neuroscience
Dissertation title: BK Channel Properties: Consequences for Cellular Excitability - Modeling, Simulation, and Experiment
In the “Experiment” part, I collected and analyzed electrophysiological data on BK channels to include in a “hybrid” deterministic-stochastic model of cell excitability.
Advisor: John Guckenheimer, Department of Mathematics, Cornell University

M.S., Applied Mathematics, Cornell University, 2005

B.S., Mathematics, University of Texas at San Antonio, 2000
Magna Cum Laude w/Division Honors
Undergraduate Honors Thesis: Modeling Follicular Growth and Development in the Human Menstrual Cycle Advisor: Dr. Mary Lou Zeeman

Teaching Experience

Instructor at CU Boulder:
Instructor: Fall 2016 – Present

Courses taught:
Modeling in Mathematics; Modeling in Mathematical Biology
Operations Research
Calculus I for Engineers, Calculus II for Engineers, Differential Equations with Linear Algebra
Matrix Methods
Online Courses: Calculus II for Engineers

Lecturer at UTSA:
Lecturer III: Fall 2014 – Summer 2016
Lecturer II: Fall 2010 – Summer 2014

Other Professional Experience

Faculty Advisor:

- SIAM Undergraduate Chapter at CU Boulder: Fall 2016 – present
- CU Boulder AWM Chapter: Spring 2017 - present

Course Coordination

- Calculus II for Engineers Course co-coordinator at CU Boulder: Fall 2017
- Matrix Methods Course co-coordinator at CU Boulder: Fall 2016
- Calculus for the Biosciences Course Coordinator at UTSA**:** Fall 2010 – Spring 2016
    - Choose textbook and create syllabus; Mentor new faculty
    - Prepare core curriculum proposal (a detailed plan for assessment of student learning goals of the core curriculum)
    - Coordinate assessment of student learning goals among faculty (create common questions, project template, grading rubrics, and assessment template)

UTSA Quantitative Literacy Program Faculty Specialist: Spring 2013 – Fall 2014

- Mentor faculty in course redesign (and assessment) for quantitative literacy
- Teach Quantitative Literacy Workshop
- Develop Online Quantitative Literacy Workshop

Redesign of Algebra for Scientists and Engineers for Quantitative Literacy: Summer 2012, UTSA

- Create "Q" Assignments that reinforce course learning goals and involve data visualization, data analysis, and synthesis and communication of results
- Create pre/post-test
- Assess pre/post-test and "Q" Assignments at individual student and question level

Biology Lab Experience:

- Spring 2006 – Fall 2006: Experimental work in Cornell University Neurobiology Laboratory (McCobb lab) gathering electro-physiological data to fit to BK channel gating model for thesis project
- Summer 2003 – Summer 2004: Internship in Cornell University Neurobiology Laboratory (McCobb lab) Cell culture and patch clamping

Professional Development

- Spring 2018: Be the Change Seminar at CU Boulder
- Fall 2016: CU Boulder Engineering Education Retreat
- Fall 2015, FIT Coffee Break - Designing and Teaching a Dynamic Online Course
- Summer 2015, UTSA Teaching Online Academy
- 2013, Softchalk 8 Training Workshop at UTSA
- UTSA Teaching and Learning Center Workshops:
    - 2016 How Do I Change to Active Learning?
    - 2015 Core Curriculum Assessment
    - 2013 Preparing a Professional Portfolio
    - 2013 An Introduction to Formative Classroom Assessment
    - 2012 Encouraging Deep Learning by Flipping the Classroom
    - 2012 A Picture is Worth a Thousand Words
- 2012, UTSA Quantitative Literacy Program Summer Training Workshops

Research Grants, Fellowships, and Awards

CU Boulder Innovative Inclusions Ideas Award (Fall 2017 for Spring 2018)
CU Boulder Undergraduate Research Opportunities Program Departmental Grant (Spring 2016 for Fall 2017-Spring 2018)
UTSA Quantitative Literacy Program Award: Summer 2012
Nominated for a UTSA Ambassadors Amber Award: Fall 2011

Postgraduate:
NSF Mathematical Sciences Postdoctoral Fellowship: October 2007 – October 2010

Graduate
SIAM Student Travel Award – Summer 2006
Mathematics Research Assistantship (RA): Spring 2006- Spring 2007
Nominated for a 2005 Department of Mathematics Teaching Award – Spring 2005
Cornell University Provost Diversity Fellowship – Fall 2005
Honorable Mention in the LOREAL USA 2004 Competition
Mathematics Research Assistantship (RA): Fall 2003 - Spring 2004
IGERT Fellowship: Fall 2001-Spring 2003
Poster award at AMS conference in San Diego, CA: January 2002

Undergraduate
LSAMP Scholarship: Summer 1999 - Spring 2000
McNair Scholarship: Summer of 1999
American Mathematical Society Waldemar J. Trjitzinsky Scholarship: 1999
Office of Naval Research (ONR) Scholarship: Spring 1998 - Spring 1999
Bernard Rappaport Scholarship: Fall 1997 - Spring 1998

Publications

Peer-Reviewed

- D. Lyles, T.S. Rosenstock, and A. Hastings,"Plant reproduction and environmental noise: How do plants do it?", Journal of Theoretical Biology (2015) 371: 137-144.
- Todd S. Rosenstock, Alan Hastings, Walter D. Koenig, Danielle J. Lyles, and Patrick H. Brown. "Testing Moran's Theorem in an Agroecosystem." *Oikos* 120.9 (2011) 1434-1440.
- D. Lyles, J. H. Tien, D.P. McCobb and M. L. Zeeman. "Pituitary Network Connectivity as a Mechanism for the Luteinising Hormone Surge." *Journal of Neuroendocrinology* 22 (2010) 1267-1278.
- D. Lyles, T. S. Rosenstock, A. Hastings, and P. H. Brown. "The Role of Large Environmental Noise in Masting: General Model and Example from Pistachio Trees." *Journal of Theoretical Biology* 259 (2009) 701-713.
- J.H. Tien, D. Lyles, and M.L. Zeeman. "A potential role of modulating inositol 1,4,5-triphosphate receptor desensitization and recovery rates in regulating ovulation." *Journal of Theoretical Biology* 232 (2005) 105-117.

Conference Proceedings
K.M. Massaro, E.F. Orta, D. Lyles, D.A. Sass, M.A. Sanchez & C. Stroud. 2014. Quantitative Literacy: Analysis of a Q Course. In *JSM Proceedings*, Section on Statistical Education. Alexandria VA: American Statistical Association. 3358-3365.

Technical Reports
Ryan Hernandez, Danielle Lyles, Dan Rubin, & Tom Voden. "A Model of Beta-cell Mass, Insulin, Glucose, and Receptor Dynamics with Applications to Diabetes." *Cornell University Biometrics Technical Reports* (2001

Professional and Research Presentations

Invited Conference Talks

- February 2016: The Third Annual LEAP Texas Forum: Texas Core Curriculum Success Stories at UTSA - Assessing Communication in Calculus for the Biosciences
- 2015: Ecological Society of America (ESA) 100th annual conference in Baltimore, MD. I gave a talk at symposium titled: Recent advances in Studies on Seed Masting: Interpreting Empirical Data with Mechanistic Models. My talk was titled "The role of large environmental noise in masting: General model and example from pistachio trees"
- 2006: SIAM-SMB Joint Conference on the Life Sciences. I gave a talk at mini-symposium. My talk was titled "BK Channel Diversity: Consequences for Cellular Excitability"
- 2004: SIAM Life Sciences Conference Joint with the SIAM Annual Meeting. I gave a talk at a mini-symposium. My talk was titled "Modeling the LH Surge: A Possible Mechanism"

Seminar Talks

2016: Math Bio Seminar at CU Boulder: The Role of Large Environmental Noise in Masting: General Model and Example from Pistachio Trees
2015 Instructor Colloquium: Engaging and Assessing Students During Class
2009: Special Seminar in Computational Biology at UTSA
2001, 2002, & 2003: IGERT seminars, Cornell University
2001: MTBI Symposium at Cornell University
2000: South Texas Math Consortium Conference in San Antonio
1999: McNair Symposium at UTSA
1998 (2) and 1999: ONR Symposia at UTSA

Professional Service and Affiliations

Professional Service

- **The University of Colorado at Boulder**
  - Faculty Advisor: AWM Chapter (Spring 2017 – present)
  - Faculty Advisor: SIAM Undergraduate Chapter (Fall 2016 – present)
    - Colorado Journal of Applied Mathematics Editor (Spring 2017 – present)
  - Referee for the International Journal of Biomathematics (Fall 2016)
- **The University of Texas at San Antonio**
  - Mathematics Department Service Evaluation Committee (Spring 2013 – present)
  - UTSA Quantitative Literacy Committee (Fall 2013 – Spring 2014)
  - UTSA Annual Review Committee (Spring 2014)
  - Referee for JTB (Journal of Theoretical Biology) – Spring 2014
  - Referee for Journal of Ecology – Spring 2014
  - Referee SIADS (SIAM Journal on Applied Dynamical Systems) – Fall 2010
- **Cornell University**
  - Conference co-organizer IGERT conference, Spring 2002 - Fall 2002
  - Referee (joint) for the Bulletin of Mathematical Biology (Spring 2002) & for the Journal of Neuroscience (Spring 2006)
  - Mentor to 1st year graduate students: Fall 2002 – Spring 2003 and Fall 2005 – Spring2006

Community Service

Volunteered with Expanding Your Horizons (EYH) at Cornell University for 3 years:

- **Registration Co-chair:** March - April 2006
- **Workshop Co-leader** "Math, Medicine, and the Menstrual Cycle" (April 2005)
- **Workshop Assistant** "Tilings and Tessellations" (April 2004)

Affiliations

- Society for Industrial and Applied Mathematics
- Association for Women in Mathematics