Michael T. Stobb

(updated: August 2024)

CONTACT INFORMATION

Coe College
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Cedar Rapids, IA 52402

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EDUCATION

Doctor of Philosophy

University of California, Merced, *Merced, CA*
Applied Mathematics
Thesis title: *Applications of Uncertainty Quantification to Coagulation Biology*
Advisors: Karin Leiderman & Suzanne Sindi
(June 2019)

Master of Science

Humboldt State University, *Arcata, CA*
Mathematical Modeling, Environmental Systems
Thesis title: *A Dynamic Neural Network Model of the Zebrafish Posterior Lateral Line Sensorimotor Pathway*
Advisor: Borbala Mazzag
(December 2012)

Bachelor of Arts

Humboldt State University, *Arcata, CA*
Applied Mathematics
Minor, Philosophy
(May 2010)

ACADEMIC POSITIONS

Assistant Professor of Data Science — August 2019 - Present
Coe College, Cedar Rapids

Graduate Student Researcher — January 2015 - May 2019
University of California, Merced

Teaching Assistant — August 2013 - December 2014
University of California, Merced

Associate Faculty — January - June 2012
College of the Redwoods

Lecturer — January - June 2012
Humboldt State University

COURSES TAUGHT AT COE

- Introduction to Computer Programming
- Uncertainty Quantification 1 & 2
- Database Systems and Data Management
- Mathematical Modeling
- Calculus I
- Calculus II
- Calculus for Engineers I
- Introduction to Data Science
- Data Centric Programming
- Data Analysis and Visualization
- Introduction to Machine Learning
- Introduction to Deep Learning

COURSES TAUGHT PRIOR TO COE

- Elementary Algebra
- Intermediate Algebra
- Contemporary Mathematics
- Critical Thinking with Computers
- Mathematical Modeling in the Biological Sciences (co-taught)
- Calculus I (Discussion)
- Probability and Statistics (Discussion)
- Ordinary Differential Equations (Discussion)
- Introduction to Linear Algebra (Discussion)

INTERNSHIPS

Nevada National Security Site June 2017 - August 2017
Livermore, CA
Worked on methods for improving the reconstruction of time-varying images captured with compressed ultrafast photography. Funding provided by the National Science Foundation Mathematical Sciences Graduate Internship Award.

COMPUTER SKILLS

AWS, Bash, C++, Dash, FEniCS, Google Cloud, Julia, Jupyter/Jupyter Hub, LaTeX, Linux, Mathematica, Matlab/Octave, PBS, Python, R, SciLab, SGE, Slurm, and SQL.

PUBLICATIONS

M. Stobb, D. M. Monroe, K. Neeves, S. Sindi, A. L. Fogelson, K. Leiderman, *Mathematical modeling identifies clotting factor combinations that modify thrombin generation in normal and factor VIII, IX, or XI deficient blood*, (Submitted 2024)

M. Stobb, D. M. Monroe, K. Neeves, S. Sindi, A. L. Fogelson, K. Leiderman, *Mathematical Modeling to Identify Clotting Factor Combinations That Modify Thrombin Generation in Hemophilia*, Blood Supplement (2022)

A. Ziskowski, **M. Stobb**, *Old Data, New Approaches: Using the hands of Corinthian vase painters for data analysis of maritime trade*, The Pottersâ Quarter: A Corinthian Context Revisited, (Hesperia Supplement), (Accepted 2021)

G. M. Finneman, N. Meskell, T. Caplice, O. Eichhorn, A. Abu-Halawa, **M. Stobb**, U. Akgun, *Proton imaging with machine learning*, Proc. SPIE 11595, Medical Imaging 2021: Physics of Medical Imaging, 1159551 (2021)

Link, K. G., **Stobb, M. T.**, et al. *Computationally Driven Discovery in Coagulation.* Arteriosclerosis, Thrombosis, and Vascular Biology (2020):41:79-86.

Stobb, M. T., Monroe, D. M., Leiderman, K., & Sindi, S. S. *Assessing the impact of product inhibition in a chromogenic assay.* Analytical biochemistry 580 (2019): 62-71.

Link, K. G., **Stobb, M. T.**, et al. *A mathematical model of coagulation under flow identifies factor V as a modifier of thrombin generation in hemophilia A.* Journal of Thrombosis and Haemostasis (2019).

Link, K. G., **Stobb, M. T.**, Di Paola, J., Neeves, K. B., Fogelson, A. L., Sindi, S. S., Leiderman, K. (2018). *A local and global sensitivity analysis of a mathematical model of coagulation and platelet deposition under flow.* PloS one, 13(7), e0200917.

Stobb MT, Peterson JM, Mazzag B, Gahtan E. (2012) *Graph Theoretical Model of a Sensorimotor Connectome in Zebrafish.* PLoS ONE 7(5): e37292.

Peterson, J. M., **M. Stobb**, B. Mazzag, and E. Gahtan. (2011) *Computational graph theoretical model of the zebrafish sensorimotor pathway.* AIP Conference Proceedings, 1368(1):139-142.

PRESENTATIONS

Fodelson A, Sindi S., **Stobb M**, Leiderman K, Contributed Talk, *Mathematical modeling to identify clotting factor combinations that enhance thrombin generation in hemophilia*, **International Society on Thrombosis and Haemostasis**, 2022.

Stobb M, Seminar Talk, *Sobol Indices Workshop*, **Colorado School of Mines Math Bio Research Group Seminar**, 2021.

Stobb M, Leiderman K, Sindi S. Poster, *Global Sensitivity Analysis of a Coagula-*

tion Model Initial Conditions, **Central Valley Regional SIAM Student Chapter Conference**, 2017.

Stobb M, Leiderman K, Sindi S. Poster, *Demonstrating Product inhibition in a chromogenic assay*, **Workshop on Parameter Estimation and Uncertainty Quantification for Dynamical Systems**, 2017.

Stobb M, Leiderman K, Sindi S. Poster, *Assessing the significance of product inhibition in a chromogenic assay*, **SIAM on Life Sciences**, 2016.

Stobb M, Leiderman K, Sindi S. Poster, *Mathematical Modeling of Enzymatic Assays: Incorporating Experimental and Parametric Uncertainty*, **Bay Area Scientific Computing Day**, 2015.

Stobb M, Meza JC, Martini A. Contributed Talk, *Parallel Replica Dynamics with Spatial Parallelization for a Driven System*, **SIAM on Computational Science and Engineering**, 2015.

Stobb M, Peterson JM, Mazzag B, Gahtan E. Poster, *Graph Analysis of a Zebrafish Sensorimotor Connectome*, **Society for Neuroscience**, 2011.

Stobb M, Peterson JM, Mazzag B, Gahtan E. Contributed Talk, *Computational Graph Theoretical Model of the Zebrafish Sensorimotor Pathway*, **Applied Mathematics, Modeling and Computational Science**, 2011.

Stobb M, Harer K, Mazzag B. Contributed Talk, *A Preliminary Model for a Zebrafish Sensorimotor Pathway*, **HSU Student Research Conference**, 2010.

AWARDED GRANTS

NSF Award: 2346616 - CC* CIRA: High-performance computing solutions for small Midwest institutions (2024-Present) $173,368
Role: Co-PI
Applied for and awarded an NSF planning grant to write a larger followup grant aimed at brining high performance computing resources to students of smaller institutions, including Coe College.

MENTORING STUDENT PROJECTS

Physics REU: NMR Deconvolution with Deep Learning Models (2024-Present)
Student: Dylan Diego *Lawrence University*
Funded by an NSF REU grant, this project aimed at developing a novel Deep Learning model to perform fast NMR deconvolutions. Motivated by work completed in the Coe Physics department and by recent success in NMR literature, Deep Learning models could potentially deconvolute NMR spectra faster and more accurately than traditional approaches. The REU student built a synthetic data set of NMR spectra for use in training their own neural network model and presented their results at a local conference.

Predicting Glass Ionic Conductivity with Machine Learning (2024-Present)
Student: Ruby Devaisher, Zach Pearlman, Michael Wlochal with Prof. Bragatto (2024-Present)
Co-mentored summer students as they scrubbed a classical database of glass information, including glass composition, resistivity, Young's modulus, and ionic conductivity, and built machine learning models to predict the conductivity of individual samples. Their results were presented at a local conference.

Digitizing the Coe Catalog (2023-Present)
Student: Graham Atz, Rebecca Havel, Isaac Hinze, Emmalee Torson, and Thanh Tran
Worked to transition Coe's current catalog, which exists as a single, Microsoft Word document, into a reproducible, trackable, set of scripts capable of reading course information directly from the Jenzabar database, eliminating the need for difficult, manual edits. Furthermore, the catalog could exist as a standalone website, compiled directly from the same source text as the finished, printed copy.

Web Application for Event Scheduling (2022-2023)
Student: Shashwat Rajkarnikar
Funded by the Lindsay Mathematics Summer Research Fund, this project was focused on the creation of a web application for use by the Coe Registrar's office to automate the sheduling of courses to rooms. The finalized web app can be found at `www.eventplacer.app`.

Using Neural Networks for Live Video Tracking (Summer 2021)
Student: Zachary Morris
Funded by the NSF STEMpath program, this project goals included the study and implementation of neural network models for the purposes of live video tracking. The results are expected to be presented at a local research symposium.

Creating a Database of Corinthian Pottery (2020-2021)
Student: Takamaru Miki
Funded by the Ella Pochobradsky Endowment for Faculty/Student Research grant, this project had the goal to construct a clean, working database from manually curated data to allow general querying, data analysis, and the generation of novel visualizations. A chapter length article was submitted and accepted from this work.

Computer Generated Room Allocations (2020-2021)
Student: Jacob McIntosh
Funded by the Lindsay Mathematics Summer Research Fund, this project goals included the creation of algorithms to automate the assignment of courses to physical classrooms that accomodate for historical trends, room capacity, and distance from departmental centers. The results were presented at a local research symposium.

Increasing Security through Increased Password Entropy (2020-2021)
Student: Zachary Morris
Funded by the NSF STEMpath program, this project goals included the study and

determination of the average entropy in human created passwords and determine ways to increase entropy through the use of novel password dictionaries. The results were presented at a local research symposium.

SERVICE WORK AT COE

Ad-Hoc Committee for Creation of Faculty Staffing Plan (2024-Present)
Committee Member
Charged with creating and implementing a faculty staffing plan for Coe College.

Academic Policies Committee (2024-Present)
Committee Member
Charged with studying the curricular structure of the college and making recommendations relative thereto; considering all policies affecting implementation of the curriculum.

Board of Trustees Facilities and Finance Committee (2023-2024)
Faculty Elected Representative
Elected by the faculty to be their representative on this Board level committee. Attended all regular board meetings, presented information brought forward by concerned faculty members, and continually monitored for issues that might impact faculty members.

Strategic Planning Committee (2022-2023)
Committee Member
Charged with creating a new strategic plan for Coe College. Worked with board members, stakeholders, faculty, administration, and students to develop a vision and mission for the College and actionable plans to realize them.

Academic Policies Committee (2022-2023)
Committee Member
Charged with studying the curricular structure of the college and making recommendations relative thereto; considering all policies affecting implementation of the curriculum. Was also designated the task of creating a systematic Program Review for the Coe campus.

Campus Technology Committee (2021-2022)
Committee Member
Charged with creating and maintaining a strategic vision for the role of technology on campus. Responsibilities include reviewing IT and technology related policies, advising IT on implementation and rollout, and acting as a faculty liason with IT.

Retention Data Group (2021-Present)
Data Analyst
Charged with analyzing and processing various retention metrics for the college. Responsibilities include aggregating data, forming predicative models, and creating visualizations that explain the computed metrics.

Title IX Advisor (2021-Present)
Student Advisor
Responsibilities include advising and assisting students moving through the Title IX process at Coe. Working with students from the early stage of an intial report, to the

live hearing, and through any displinary stages.

Assessment Committee (2020-2021)
Committee Member
Charged with ensuring faculty and staff plan, implement, and review proper assessment of learning outcomes as mandated by the accreditation boards. Responsibilities include reviewing department assessment plans, being a liaison between departments and the committee, and educating current faculty and staff in assessment practices.

Special Subcommittee for First Year Seminar Revision (2020-2021)
Committee Member
Charged with revising the current FYS structure to better align with the newly passed general education learning outcomes.

Iowa MAA NExT Steering Committee (2019-Present)
Committee Member
Responsibilities include determining future agenda and events for local MAA NExT section meetings and assisting in the organization and implementation of such meetings.

SERVICE WORK PRIOR TO COE

SIAM Student Chapter Officer (2018-2019)
President
Co-organized career panel and weekly seminar. Main organizer for the annual Central Valley Regional SIAM Student Chapter Conference.

Founding Member of The Math Center (2016-2017)
Supervisor
Original member of the planning committee for The Math Center, an oncampus center for all UC Merced undergraduate math tutoring, and first supervisor of paid undergraduate tutors. The first year saw over 500 unique visitors who received specialized math tutoring services. Helped shape the mission of the center, determine assessment metrics, hire and train tutors, and manage the day-to-day operations.

SIAM Student Chapter Officer (2016-2017)
Secretary
Coordinated and organized a graduate student ran weekly seminar featuring local students and the co-organizer for the Central Valley Regional SIAM Student Chapter Conference.

GRAD-EXCEL Peer Mentor (2016-2019)
Graduate Mentor
Mentored first year applied math graduate students in biweekly meetings. Topics ranged widely from managing the work/life balance to instructions and best practices for using the local Grid cluster.

DESCARTES Undergraduate Mentor (2014-2019)
Graduate Mentor
Engaged in an ongoing mentorship of five applied math undergraduates starting in the summer of 2014 continuing through their graduation in 2018. Responsible for teaching programming and mathematical modeling skills as summer workshops and

leading students in presentations at local conferences.

New Graduate Student Computational Bootcamp (2013-2019)
Coordinator
Coordinated and ran a computational bootcamp for incoming applied mathematics graduate students. Workshops focused on the importance of the Linux command line, compiled programming languages (C++, Fortran, etc.), advanced data visualization, and the use of LaTeXfor typesetting.

Summer REU Matlab Course (2013-2015)
Coordinator
Coordinated and ran a two day Matlab tutorial session for incoming math and chemistry REU students.

PROFESSIONAL MEMBERSHIPS

- Society for Industrial and Applied Mathematics (2013-Present)
- Mathematical Association of America (2019-Present)
- Project NExT (2019-2021)

AWARDS

- UCM GRAD-EXCEL Peer Mentor Award (2018)
- UCM Applied Mathematics Research Travel Fellowship Award (2017)
- UCM GRAD-EXCEL Peer Mentor Award (2016)
- UCM Applied Math Fellowship Award (2015)
- General Pedagogy Award (2015)
- UCM GradSLAM! Finalist (2015)
- Humboldt State University Outstanding Teaching Award Recipient (2012)