Emma Hart

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EDUCATION

Emory University, Atlanta, GA — Present
Ph.D. in Mathematics

Colgate University, Hamilton, NY — May 2022
Bachelor of Arts; Major: Applied Mathematics; Minor: Educational Studies
GPA: 4.02/4.00

PAPERS

Elle Buser, Emma Hart, and Ben Huenemann. "Comparison of atlas-based and neural-network-based semantic segmentation for DENSE MRI images." *SIURO Volume 15, Published electronically May 26, 2022. DOI: 10.1137/21S1448392*

PRESENTATIONS

(Invited) SIAM Conference on Mathematics of Data Science, Atlanta, GA. "Paired Autoencoders for Inference and Regularization," October, 2024

(Invited) SIAM Conference on Imaging Science, Atlanta, GA, "Low-rank Approaches for Reduced Networks in Inverse Problems," May, 2024

DISC Graduate Seminar, Emory University, Atlanta, GA. "Autoencoders for Inverse Problems" March 2024

Georgia Scientific Computing Symposium, Emory University, Atlanta, GA, "Paired Autoencoders for Inference and Regularization," February, 2024

DISC Graduate Seminar, Emory University, Atlanta, GA. "Image Registration for Diagnosis of Chiari Malformation," October 2022

Georgia Scientific Computing Symposium, Georgia Institute of Technology, Atlanta, GA, "Image-Based Diagnosis of Type I Chiari Malformation," February, 2022

Hudson River Undergraduate Mathematics Conference, Keene State College, Keene, NH, "On Ash Trees in the Green Mountain Region," April, 2021

CONFERENCES

Copper Mountain 18th Conference on Iterative Methods, April 2024, Copper Mountain, CO

Georgia Scientific Computing Symposium, February 2024, Emory University, Atlanta, GA

Supercomputing (SC23), November 2023, Denver, CO (virtually)

DOE Annual Program Review, July 2023, Washington D.C.

AMS Southeastern Sectional Meeting, March 2023, Georgia Institute of Technology, Atlanta, GA.

SIAM Conference on Mathematics of Data Science (MDS22), September 2022, San Francisco, CA (virtually)

Georgia Scientific Computing Symposium, February 2022, Georgia Institute of Technology, Atlanta, GA

Hudson River Undergraduate Mathematics Conference, April 2021, Keene State College, Keene, NH

RESEARCH

Graduate Research Present
Advisors: Julianne and Matthias Chung
Developing methods for large-scale, ill-posed inverse problems (surrogate modeling, prior-learning, uncertainty quantification) by leveraging representation learning techniques

Undergraduate Senior Thesis Fall 2021
Advisor: Professor Dan Schult
"*The transition of opposed flow smoldering to flaming combustion*": developed a three step reaction model and simulated the system of partial differential equations to explore transitions between combustion states

NSF REU at Emory University Summer 2021
Advisor: Professor Lars Ruthotto Collaborators: Elle Buser, Ben Heunemann, Justin Smith
"*Comparison of atlas-based and neural-network-based semantic segmentation for DENSE MRI images*":
Compared how well these semantic segmentation approaches could identify regions of interest in a given MR image and produce a biomarker to be used in the diagnosis of Chiari Malformation

TEACHING EXPERIENCES

Emory University

MATH 116: Life Sciences Calculus II TA — *Primary Instructor Malena Sabate Landman*, Spring 2024
MATH 212: Differential Equations Grader — *Primary Instructor Manuela Manetta*, Spring 2023
MATH 112: Calculus II Grader — *Primary Instructor Jim Nagy*, Fall 2022

Colgate University

MATH 260: Computational Mathematics TA — *Primary Instructor Silvia Jiménez Bolaños*, Spring 2021, 2022
Mathematics Peer Tutor — *Colgate Center for Learning, Teaching, and Research*, Fall 2021
Writing Center Peer Consultant — *Writing and Speaking Center*, Fall 2019 - Spring 2022

Other

Schroeder High School, Webster, NY and **Hamilton High School**, Hamilton, NY
Volunteer Math Tutor — Summers 2016-2018, Spring 2019

HONORS AND AWARDS

Computational Sciences Graduate Fellowship — Department of Energy
Dean's Award for Academic Excellence with Distinction — Colgate University, all semesters
Osborne Mathematics Prize for achievement in mathematics — Colgate University, Spring 2021
Sisson Mathematics Prize for achievement in mathematics — Colgate University, Spring 2020
Charles A. Dana Scholar for academic achievement and leadership — Colgate University, Spring 2020
Liberal Arts Core Curriculum Prize, voted best core research paper — Colgate University, Spring 2020
Liberal Arts Core Curriculum Prize voted best core analytical paper — Colgate University, Spring 2019

COMPUTER PROFICIENCIES

MATLAB, Python, LaTeX, R, GitHub