JONATHAN VALYOU

FSU TAM FAMILY FELLOW | 5th YEAR APPLIED & COMPUTATIONAL MATHEMATICS PHD STUDENT

Email: jmv18b@fsu.edu Location: Tallahassee, FL

Education

Florida State University – Tallahassee, FL
PhD Applied and Comp. Mathematics (Expected 2027)
Advisors: Sanghyun Lee & Hristo Chipilski
PhD Dissertation: Ensemble-Based Approaches to Quantifying Uncertainty in Fluids

Emory University - Atlanta, GA
BS Applied Mathematics (2022)
Advisor: Elizabeth Newman
Honors Thesis: Nonnegative Matrix Factorization for Music – Tuning the NMF Algorithm with Regularization

Relevant Work Experience

Research Assistantship, Florida State University & Sandia National Labs
Sept 2026 – Present Tallahassee, FL & Albuquerque, NM

Teaching Assistantship, Florida State University
Aug 2022 – Aug 2026 Tallahassee, FL

Research Assistantship, Naval Research Labs
June 2024 – Aug 2024 Washington, DC

Research/Teaching Experiences, Emory University
Sept 2019 – May 2022 Atlanta, GA

Research Interests

Data Assimilation | Optimization | Numerical Linear Algebra | Neural Networks | Optimal Control

Coding Experience

Languages: Python | MATLAB | R | Java | C | C++ | Transact-SQL
Packages: torch | pytorch | keras | FEniCS | FEniCSx | matplotlib | NMFtoolbox

Submitted Publications

1. A Hybrid Coarse-to-Fine Framework for Quantum Computing in Heterogeneous Darcy Flow (K. Chawla, S. Lee, J. Valyou 2026) – *Under revision at the SIAM Journal of Scientific Computing*.
2. A Conjugate-Gradient Formulation of the EnKF Algorithm (S. Lee, Z. Liu, J. Valyou, L. Zikatanov 2026) - *Under revision at the Journal for Computers and Mathematics with Applications. Available on arXiv.*
3. Optimal mean-time path planning for unmanned underwater vehicles: a Hamilton-Jacobi approach (J. Valyou, J. Brandman, S. Lee 2026) - *Under revision at Journal of Scientific Computing. Available on arXiv.*

Developing Manuscripts

4. Extending Ensemble Kalman Inversion to Non-Gaussian Settings: Noise-Free Analysis and Parameter Estimation Application (R. Baptista, E. Carlson, H. Chipilski, S. Lee, J. Valyou)
5. Using Normalizing Flows to Approximate Transport Maps for Non-Gaussian Underground Reservoir Parameter Estimation (H. Chipilski, S. Lee, J. Valyou, H. Yoon)

Awards

FSU Tam Family Fellowship (2022-Present): $25,000
FSU Dean's Award for Doctoral Excellence (2024-Present): $9,000
FSU Bettina Zoeller Richmond Award (2025): $500
SIAM Student Chapter Certificate of Recognition (2024)
FSU De Witt Sumners Flash Talk Competition – 3rd Place (2023): $100
Emory Robert W. Woodruff Scholarship –Full Tuition/Room & Board (2018-2022)
State of Florida Department of Education Leadership Award (2017)

Software

1. Path Planning Under Uncertainty Framework (2026) [Available Upon Request & Approval By Naval Research Laboratory)
2. CGD-EnKF – A conjugate gradient reformation of EnKF and ESRF (2026) [Available Upon Request]

Selected Talks/Poster Presentations

CADRE-EPIC Data Assimilation Training and Science Workshop, Norman, OK (2026)
Southeast Applied and Computational Mathematics Graduate Student Workshop, Atlanta, GA (2026)
NASC RTG of Rice University Ranch Retreat, Galveston, TX (2026)
FSU Stochastic Computing Seminar, Tallahassee, FL (2026)
FSU Graduate Student Seminar, Tallahassee, FL (2024, 2025, 2026)
Clemson Graduate Student Mini-Conference in Applied and Computational Mathematics, Clemson, SC (2025)
Southeast Applied and Computational Mathematics Graduate Student Workshop, Auburn, AL (2025)
Candidacy Exam Talk, Tallahassee, FL (2024)
FSU Data Science Symposium, Tallahassee, FL (2023)
Georgia Scientific Computing Symposium, Atlanta, GA (2022)
Emory REU in Data Science Poster Session, Atlanta, GA (2022)

Teaching Experience

Florida State University

MAC 2233 – Applied Calculus Co-Instructor	Summer 2026
MAD 5404 – Foundations in Computational Math 2 Graduate Recitation/Grader	Spring 2026
MAD 5403 – Foundations in Computational Math 1 Graduate Recitation/Grader	Fall 2025
MAS 3105 – Applied Linear Algebra Solo Instructor	Summer 2025
MAC 2311 – Calculus with Analytical Geometry I Solo Instructor	Spring 2025
MAC 2311 – Calculus with Analytical Geometry I Solo Instructor	Fall 2024
MAD 2104 – Discrete Mathematics I Recitation/Grader	Spring 2024
MAC 2311 – Calculus with Analytical Geometry I Recitation/Grader	Fall 2023
SLS 1010L – Learning Support Lab for Mathematics	Summer 2023
MAC 2233 – Business Calculus Lab	Spring 2023
MAC 1114 – Analytical Trigonometry Lab	Fall 2022, Spring 2023
MAC 1105 – College Algebra Lab	Fall 2022

Emory University

CHEM 202L – Principles of Reactivity Lab Assistant	Spring 2020, Fall 2022
CHEM 150L – Structure and Properties Lab Assistant	Fall 2019, Fall 2021

Services

Emory Woodruff Alumni Advisory Board Member (2025-Present)
Reviewer for SIAM Journal of Scientific Computing (2026)
FSU Student SIAM Chapter President & Founder (2023-2026)
FSU Mathematics Graduate Student Council Committee Member (2023-2026)
FSU Mathematics Directed Reading Program Mentor (2022-2026)
FSU Math Fun Day Volunteer (2024, 2025, 2026)
Emory Dean's Achievement Scholarship Finalist Committee (2025, 2026)
Emory Robert W. Woodruff Scholar Finalist Interview Committee (2022, 2026)
Atlanta Pediatric Cancer Outreach Fundraising Chair (2021-2022)
President of Nease HS Mu Alpha Theta (Math Honor Society) Chapter (2017-2018)

Mentoring Experiences

Mikhail Sautkin (FSU Math Directed Reading Program) - Project: Local Ensemble Transform Kalman Filter (2025-2026)
Daniel Melton (FSU Math Directed Reading Program) - Project: Ensemble Kalman Filtering (2024-2025)
Julian Jordan (FSU Math Directed Reading Program) - Project: Ensemble Kalman Filtering (2024-2025)
Matthew Cegala (FSU Experiential Learning Program) – Project: MAC2311 Learning Assistantship (2024)
Jingwen Zhuo (FSU Math Directed Reading Program) - Project: Nonnegative Matrix Factorization (2023-2024)
Max Varela Torres (FSU Math Directed Reading Program) - Project: Nonnegative Matrix Factorization (2023-2024)
Reagan Bourne (FSU Math Directed Reading Program) - Project: Utilizing Convolutional Neural Networks for Data Visualization (2023)

Graduate Coursework Completed

MAD5403 – Foundations in Computational Mathematics I
MAD5404 – Foundations in Computational Mathematics II
MAP5165 – Methods of Applied Mathematics I
MAP5423 – Complex Variables, Asymptotic Expansions, & Integral Transforms
MAP6356 – Advanced Partial Differential Equations I
MAP6357 – Advanced Partial Differential Equations II
MAP5932 – Nonlinear Waves
MAD5420 – Numerical Optimization
MAD5932 – Numerical Linear Algebra I
MAD5738 – Numerical Solution of Partial Differential Equations I
MAP5395 – Finite Element Methods
MAP6939 – Advanced Seminar in Applied Mathematics
MAT5907 – Directed Individual Study
MAT5921 – Graduate Mathematics Colloquium
ISC5935 – Computational Aspects of Data Assimilation