

PERSONAL INFORMATION

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EDUCATION

Ph.D Mathematics, University of Massachusetts Amherst, Fall 2018 -Present

M.S. Applied Mathematics, University of Massachusetts Amherst, May 2018 (Masters GPA: 3.9/4.0)

Coursework:

- 2 year long projects detailed below.
- Numerical Analysis [Error Propagation, Rootfinding, multiple roots. Interpolation theory, function approximations. numerical integration, numerical solutions to differential equations].
- Year long sequence in Probability and Stochastics covering probability fundamentals, markov chains on discrete (countable or finite) state space, continuous time MC, and Markov chain Monte Carlo. Course included random variable and Markov chain simulation with applications.
- Year long sequence in fundamentals of ordinary and partial differential equations, and an advanced course in dynamics covering chaos, invariant manifolds, global solution existence and Lipschitz functions.
- Topics Courses in
 - Math Modeling [perturbation methods, keplers laws, fluid dynamics , others]
 - Multiscale Methods [Averaging And Homogenization methods for Ordinary Differential Equations via ergodicity and perturbation methods, Stochastic Differential Equations and homogenization for Elliptic PDE equations. Numerical simulation and solutions of these equations]
 - Uncertainty Quantification [Rare event simulation and quantification. Variance Reduction methods. Importance Sampling, Cross Entropy using Kullback-Leibler Distance. Numerical simulation and analysis of theoretical topics].

B.A. Mathematics & B.S. Chemistry, The College of William and Mary, December, 2015 (Overall GPA 3.62/4.00)

Eagle Scout (Awarded by Troop 1829 on 01/25/2010) with Bronze palm

RESEARCH AND PROJECTS

Multi-scale Mathematical Models for Material Deformation Analysis. Sep 2017 - May 2018.

Group project implementing multiple scale modelling of materials in the form of a “course-graining” with RVEs for improved deformation behavior predictions. Focus on visual / qualitative deformation behavior. Applications to failure modes and structural changes of ligaments under stress were considered.

Automated Tumor Detection in Medical Images. Sep 2016 - April 2017.

Part of a team that created tools for computer aided tumor diagnosis using tools from machine learning and computer vision. Deep CNN’s were used to learn features for tumor recognition automatically.

2014 EXTREEMS-QED summer program: College of William and Mary. Advised by Chi-Kwong Li. Supported by NSF

Studied conditions and methods for decomposing important computational pieces of experimental/theoretical Quantum Computing using matrix theory. Studied related matrix problems and problems in Convex Analysis. Supervised by Chi-Kwong Li. Results presented at JMM 2015 San Antonio.

Research Assistant Spring 2014, Fall 2014 - Fall 2015 semesters.

Continued work on Quantum Computing. Advised by Chi-Kwong Li.

TEACHING EXPERIENCE

Teaching Assistant - Fall 2017, Spring 2018 for Calculus I, Fall 2016 for Calculus II. Both at UMass Amherst

Grader -Abstract Algebra I, Spring 2015, under Professor Pietro Paparella

OUTSIDE PRESENTATIONS

Matrix Problems in Quantum Computing; Spring 2015 William and Mary Undergraduate Reserach Symposium

Decomposition of Quantum Gates; Linear Algebra Paper session, Joint Mathematics Meetings San Antonio, Jan 12th, 2015

COMPUTER SKILLS

Skills/knowledge: Numerical Approximations and Analysis, Data Structures, Algorithms (analysis and design), Finite Element Solutions, Machine Learning.

Main Languages:

Python

Most comfortable and versatile in Python. Have utilized the language for a large variety of applications and in a variety of contexts, including basic data analysis (good familiarity with pandas), financial analysis and time series analysis, machine learning and neural network implementation (pytorch and keras), random variable and markov chain simulation, numerical differential equations.

Java

Very comfortable, having used Java as a go-to workhorse language to study and implement basic coursework on data structures and algorithms. Recent work includes from-scratch implementation of basic cryptography problems and algorithms such as Shanks algorithm for DLP, and decrypting a message encoded with a random substitution cipher.

Matlab

I've used Matlab extensively for mathematics and data driven tasks because of its computational efficiency and high level graphics tools. It is my primary language for data visualization and analysis, mathematical modelling, and numerical analysis.

Latex

I use Latex for all documents, papers, presentations.

Html

Design and maintain my personal website using html and a minor amount of css for formatting purposes.

Some familiarity: R for statistical aspects of projects as needed. Ruby for fun and well roundedness.

LEADERSHIP ROLES

Rock Climbing Coach, Team Gneiss at Central Rock Gym Hadley [2016 - present]

Nationally competitive team based in Hadley, Massachusetts. Competitors participate in USA Climbing sanctioned youth competition seasons for Boulderling (ABS) and Sport Climbing (SCS) from Oct thru Jul each year. Regularly have 5+ competitors qualify for and attend national level competitions. In July of 2017, had 3 competitors place in the top 8 at sport climbing nationals in Atlanta, GA.

Trip Leader, Tribe Adventure Program/William and Mary Campus Recreation [2012-2015 // 3 years]

Led students and faculty on backcountry rock climbing, backpacking, and hiking trips. No experience was ever required of participants. Led two pre-semester orientation trips for incoming freshmen every August, which serve as part of many student's orientation process, and as their first exposure to The College.

President William and Mary Climbing Club [2012-2013 // 1 year]

WORK EXPERIENCE

Rock Climbing Coach - see above (Fall 2016 -present)

Research and Development Intern at Adhesive Applications, Easthampton MA

Assisted the R&D team with development and testing of new products. Developed and maintained quantitative tools for quality assurance and manufacturing process anlaysis. (Summer 2017)

Construction

Primarily did finish carpentry. Installed exterior siding, exterior and interior doors. Construction of exterior stairs, decks. Complete indoor trim, porcelain and ceramic floor/wall tiling. Involved in the construction of 2 custom private rock climbing walls. (Winter 2015 - Fall 2016)

Part Time Bike Mechanic, mainly at Bikes Unlimited in Williamsburg (May 2013 - December 2015)

Activities

William and Mary Cycling Team (attended collegiate mountain biking nationals in October 2014)

William and Mary Rock climbing club (president 2012-2013)