YABIN ZHANG

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EDUCATION

Rice University, Houston, TX
Ph.D. in Computational and Applied Mathematics 8/2020
Dissertation: "Numerical Methods for Boundary Integral Equations"
M.A. in Computational and Applied Mathematics 8/2017
Thesis: "A Fast Direct Solver for Boundary Value Problems on Locally-perturbed Geometries"
Advisor: Adrianna Gillman

UCLA, Los Angeles, CA
B.S. in Applied Mathematics Cum Laude Honor 6/2015

RESEARCH EXPERIENCE

University of Michigan, Ann Arbor, MI
Post-doctoral Research 8/2020 – present
• Develop fast simulations for Stokes flow in complex geometries
• Develop quantum algorithms for discrete and continuous optimization problems

Rice University
Dissertation Research 8/2015 – 8/2020
• Developed efficient discretization and fast algorithms for solving boundary integral equations
• Extended the algorithms to simulate bodies in Stokes flow, such as micro swimmers
• Incorporated the fast algorithms to study wave scattering in layered media

UCLA
Faculty Directed Research and Summer REU 3/2014 – 8/2014
• Reviewed various math models for the swarming behavior of animals
• Constructed emotional contagion models for human crowd dynamics in case of an emergency
• Implemented contagion models and built 2D and 3D visualizations

TEACHING EXPERIENCE

University of Michigan
Course Instructor 8/2020 – present
• Math 115: Calculus I
• Math 471: Introduction to Numerical Methods

Rice University
Teaching Assistant 8/2015 – 5/2019
• CAAM 335: Matrix Analysis
• CAAM 336: Differential Equations in Science and Engineering
• CAAM 452: Numerical Methods for Partial Differential Equations

RELATED EXPERIENCE

BP America, Houston, TX
Quantitative Analytics Summer Internship 5/2019 – 8/2019
• Developed algorithm to extract strategic information from historical gas and power price data
• Designed and implemented heuristic algorithms to find the optimal power plant dispatch
• Analyzed the complexity and optimality gap of the algorithms for historical power deals

PUBLICATIONS

"An Alternative Extended Linear System for Boundary Value Problems on Locally Perturbed Geometries", Journal of Computational Physics, 2021
"A Fast Direct Solver for two-dimensional Quasi-periodic Multilayered Media Scattering Problems", BIT Numerical Mathematics, 2020
"A Fast Direct Solver for Boundary Value Problems on Locally Perturbed Geometries", Journal of Computational Physics, 2018

AWARDS

SIAM Early Career Travel Award (CSE21)
SIAM Student Travel Award (CSE19, ALA18)
K2I Computational Science and Engineering Enhancement Fellowship 2015 – 2019
Alan Weiser Memorial Travel Award 2018
Ken Kennedy - Cray Inc. Graduate Fellowship 2016 – 2017

PRESENTATIONS

ARC Annual Program Review (2021-Poster)
SIAM Conference on Computational Science and Engineering (2021, 2019, 2017)
AMS Joint Mathematics Meeting (2020)
Waves (2019)
Symposium of the International Association for Boundary Element Methods (2018)
SIAM Conference on Applied Linear Algebra (2018)
Applied Math/Analysis Seminar at Yale University (2018)
ICERM: Fast Algorithms for Generating Static and Dynamically Changing Point Configurations (2018)
Modern Advances in Computational and Applied Mathematics Workshop (2017-Poster)
Rice Oil and Gas HPC Conference (2017-Poster)

PROGRAMMING SKILLS

Proficient: MATLAB and Python
Familiar with: C, C++, and FORTRAN

MEMBERSHIPS

Society for Industrial and Applied Mathematics (SIAM) 2013 – present
Association for Women in Mathematics (AWM) 2013 – present