JIANNAN JIANG

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA 2019 – now

- Ph.D. student in Department of Mathematics, Analysis Group.
- Advisor: Prof. Hayden Schaeffer.

University of California, Berkeley, Berkeley, CA 2017 - 2019

- Applied Mathematics and Computer Science, B.A.
- Graduated with the highest honors in Applied Mathematics
- Graduated with the high distinction in general scholarship, GPA: 3.9/4.0

University of California, Davis, Davis, CA 2015 - 2017

RESEARCHS

Sparse identification of nonlinear dynamics Python/MATLAB 2020–2021

- Advisor: Prof. Hayden Schaeffer
- Developed variants of algorithm for sparse identification of nonlinear dynamics (SINDy), improving the original idea to be more robust. The new variant now performs more consistently and has provable convergence guarantees and recovery guarantees under some statistical hypothesis. Manuscript in preparation.

Numerical experiments over popular Reduced Order Modelling methods Python 2021 – now

- Advisor: Prof. Hayden Schaeffer
- Implemented popular reduced order models for nonlinear dynamics.
- Performed error analysis and estimates to the closure problem in linear reduction of large Markovian systems.

Particule Tracer Algorithm in geodynamics (REU) C++ 2016

- Advisor: Prof. Elbridge Puckett
- Implemented active tracer particles in the open source code ASPECT.
- Compared the convergence rate of this algorithm on the benchmarks in computational geo-physics with previously implemented algorithm. Results are presented in AGU Fall 2016 Meeting.

PROGRAMMING PROJECTS

Rudimentary File System C++

- Reimplemented an extensible file system, resembling the file system used in linux kernel, ext2.
- Implemented a thread-safe cache with clock algorithm for better performance.
- Implemented rollbacks for invalid and unsuccessful operations.

Real Time 3D Fluid Simulation C++

- Worked on modelling fluids via a particle based method, derived equations for different forces, implemented updating algorithms for each time step, and tuned auxiliary parameters for better rendering qualities and performances.

Eigenvalue for Tridiagonal Matrix MATLAB

- Taking advantage of the sparsity patterns of tridiagonal matrices to solve for their eigenvalues.
- Employed bisection and divide and conquer as two fundamental ideas that results in two different schemes that can be efficient under different scenarios.

SKILLS

Programming Languages	Python, C/C++, MATLAB
Familiar with:	Rust, Java, R, SQL, Excel
Languages	Chinese, English (GRE: 161V, 170Q, 5.0W)

LEADERSHIP AND ACHIEVEMENTS

Teaching Assistant Carnegie Mellon University 2019-2021

- Assisted in teaching 4 undergraduate courses. Topics included: Integration and Approximation, Linear Algebra and Vector Calculus for Engineers, Introduction to Ordinary Differential Equations

Honorable Mention Team in Putnam Math Competition 12/2017

- Participated in the Berkeley team for Putnam Math Competition, the most prestigious college level math competition in the U.S.
- Ranked 122 among 4638 students who participated. UC Berkeley team placing 7th out of 464 teams.

Undergraduate Student Instructor UC Berkeley 2018

- Assisted in teaching complex analysis: hold office hours, write homework solutions, substitute lectures, make and grade exam problems.

Learning assistant of MAST program 2016 - 2017

- A program dedicated to provide better quality of college level math instruction. Paired with a TA in discussion sections of college-level calculus to assist 40 students with group works assigned by the course instructor.

G. Thomas Sallee Prize 04/2016, 04/2017

Robert Lewis Wasser Memorial Scholarship 2016

Pepsi Scholarship 12/2016

SIDE PROJECTS

Python Library for Numerical Linear Algebra Python

- Implemented all numericl methods in graduate computational linear algebra course in python.
- Optimized code for simplicity while preserves the optimal asymptotic complexity.

Visualization of undergraduate ODEs MATLAB

- A list of MATLAB codes to help visualize all types of ODEs encountered in the undergraduate ODE course.