

Qichen Xu

qichenxu@uchicago.edu • +1 206-530-5922 • peterxqc.github.io

Education

University of Chicago Chicago
Ph.D. in Computational and Applied Mathematics Sep 2023-Present
University of Washington Seattle
B.S. Double Majoring in Applied Mathematics & Mathematics Sep 2019-Jun 2023
Cum Laude; Departmental Honors in Mathematics.
Dean Honor List 2019-2023; Thesis Mentored by Prof. Krzysztof Burdzy.

Research

Light Field Super-Resolution and Denoising May 2023 - Sep 2023

Research Assistant at Tsinghua University, Supervised by Sen Wan

Engaged in the research and development of an advanced deep learning-based super-resolution and denoising pipeline for light field images to improve the performance of existing schemes and assembling a new light field image processing pipeline to enhance the applicability and performance of light field cameras. project involves the extensive use of PyTorch, Python, and MATLAB.

Pysindy library for nonlocal interactions Nov 2021 - Sep 2023

Research Assistant at AI Institute for Dynamic Systems, Supervised by Dr. Zachary Nicolaou

Implement a nonlocal SINDy library that enables pysindy packages to leverage sparse optimization to identify systems with nonlocal interactions. With our library, Pysindy can be applied to models like Boltzmann's equation, integro-differential equations, and nonlocal reaction-diffusion equations to solve problems in physics, neuroscience, and engineering.

Error Bounds For Block Lanczos Matrix Function Approximation Nov 2021 - Feb 2023

Supervised by Prof. Tyler Chen

Analyze the performance of the Block Lanczos function approximation algorithm in approximating a given matrix function. Analytically construct an error bound that serves as a practical stopping criterion of the numerical method, and numerically evaluate the performance and behavior of the bound with python programs. Perform analytical research and write a public research paper (published by Numerical Algorithms). Analytical result and some numerical experiments are summarized in arXiv: 2211.15643.

Hypergraphs from Network Data for Cybersecurity Oct 2022 - Dec 2022

Mentored by Dr. Bill Kay and Stephen Young, Washington Experimental Mathematics Lab

Analyze network data in an open cybersecurity dataset to distinguish hypergraph features that signal anomalous network activities using tools from hypergraph visualization package (HypernetX) and scientific computing packages like Network X, Neo4j, and NumPy.

Experience

HEARO Mentorship Program Seattle

Mentor

Oct 2022 - Present

Hold weekly meetings with community college students in Washington states to bridge the gap between UW's curriculum and community colleges' course setup. Introduce UW's resources to community college students to help them reach academic success. Offer suggestions in their career planning and answer their academic questions.

UW Aeronautics & Astronautics CubeSat Team Seattle

Software Developer

May 2020 - Sep 2021

Develop Magnetorquer flight control software to control the satellite in space using C, C++, and read hardware status from Arduino. Visualized GitHub data for effective collaboration. Document and test the software and write code to create applications that either stand-alone or boost access to servers and services. Use various source debuggers and visual development environments to modify, write and debug software for applications.

Skills & Hobbies

Proficient in performing rigorous mathematical analysis, numerical methods, high performance computing (OpenMP, MPI, CUDA) with C++, and programming languages including Python, Java, Julia, MATLAB, and SQL.

Hobby Piano (10 years), and Badminton (10 years).