Matt Ketkaroonkul

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Summary of Qualifications

- Aspiring researcher interested in plasma physics, especially in applications for nuclear fusion and astrophysics
- Strong leadership and community-building skills especially in STEM environments
- Specialization in computational math and physics, as well as physical theory work
- Proficient skills in research work, such as communicating scientific findings through presentations, reports, etc.

Education

University of Washington Expected Jun 2024

B.S. Comprehensive Physics and Astronomy (Double Major.) *Seattle, WA*

- **3.9 GPA**. Quarterly Dean's List since Autumn Quarter 2020
- Minor in Aeronautical & Astronautical Engineering
- Concentration in courses with computational math and plasma physics

Research Projects

Magnetohydrodynamics Theory Research Jun 2022 - Oct 2022

Princeton Plasma Physics Laboratory

- PI/Supervisor: Dr. Adelle Wright
- 40 hrs/week
- Testing the robustness of current sheet structures in fusion plasmas posited by Multi-Region Relaxed MHD (MRxMHD)
- Analyzing linear and non-linear effects of a boundary-perturbed plasma
- Applying Fourier Analysis, Perturbation methods to general solutions of magnetic field within plasma
- Applications of analytical model in tokamak and stellarator reactors
- Presented research project at the APS Division of Plasma Physics in Spokane, WA
- Submission of report to US Dept. of Energy

Porting MATLAB magnetic probe signal processing into Python Oct 2021 - Present

University of Washington HIT-SI Lab

- PI/Supervisor: Dr. Chris Hansen
- 2-6 hrs/week
- Updated codebase of data processing scripts from MATLAB to Python
- Signal filtering of the magnetic probes on the HIT-SIU experiment
- Research in the lab focuses on the spheromak concept for magnetic confinement fusion, especially the dynamics of sustaining the steady-state plasmas

CAD Design of HIT-SIU Experimental Reactor Parts Jun 2021 - Sep 2021

University of Washington HIT-SI Lab

- PI/Supervisor: Dr. Chris Hansen
- 20 hrs/week
- Designed CAD models in SolidWorks for CNC machining of experiment components
- Gained machine shop experience in manufacturing components used in reactor coil power supplies

Publications and Presentations

Exploring the Formation and Robustness of Relaxed MHD States. APS Division of Plasma Physics Conference. October 18, 2022. Spokane, Washington.

Campus Engagement

President, Software Team Lead Nov 2020 - Present

Astronomy Undergraduate Engineering Group, Student Organization *Seattle, WA*

- Organized trips to student observatory for maintenance work
- Contributed to community building in STEM projects
- Designed Python and C++ interface with CCD telescope camera
- Attracted 20+ interested students to organization at student fair

Safety Officer, Science Subteam Member Sep 2020 - Dec 2020

NASA L'Space Mission Concept Academy *Virtual*

- Undergraduate team of 10 researching a mission proposal for space probe
- Analyzed Mars InSight seismic data in MATLAB (e.g. kinematic measurements) to present concept of seismic experiment in mission to Enceladus
- Mobilized team effort to document engineering safety procedures during mission phases, received professional-level ratings

Additional Projects

Interface Design for Telescope Camera Jun 2021 - Present

Astronomy Undergraduate Engineering Group

- Wrote Python wrapper for C++ library used to control a CCD telescope camera
- Developed a React.js + Python Flask web application to take images from telescope camera
- Wrote and taught lessons about coding concepts, libraries (git, Python, JavaScript, React.js
- Hosted project meetings to discuss code review and share project progress

Additional Professional Experience

Coding Tutor May 2020 – Aug 2021

Code Ninjas *Newcastle, WA*

- Hosted virtual calls for coding lessons in JavaScript, Roblox
- Wrote and taught 2 coding courses in Roblox, a popular game design platform
- Offered tours and coding demonstrations for prospective students, successfully enrolled over 5 students

Course Grader May 2022 – Jun 2022

University of Washington *Seattle, WA*

- Graded assignments for an Astronomy course in data science in Python

Additional Skills

- Computer-Related
  - Proficient in GNU/Linux OS
  - Languages: Python, Java, C++, JavaScript
  - Other Applications: LaTeX
- Other Languages Spoken
  - Thai
  - Chinese