Seeking Graduate Students Interested in Physics-Informed Machine Learning

Dr. Zhuoyuan Song and Dr. Frances Zhu is seeking two graduate students for paid research assistant positions as a part of the NSF Artificial Intelligence Institute in Dynamic Systems. The desired research outcomes are to develop physics-informed ML methods, demonstrate their application, and train the next generation in these techniques, presents a significant interdisciplinary challenge that will require a coordinated effort best served by a large team united under a single institute with a common goal. Our team represents an intellectually and geographically diverse set of faculty with exceptional strength in all four critical disciplines required for developing foundational AI methods, with a mix of theorists and experimentalists. Topics include:

- Model Discovery: Towards Parsimony and Interpretable ML
- Leveraging Predictions in Online Decision Making
- Robust Reinforcement Learning
- Safety Online Optimal Control
- Uncertainty Quantification for Safe Reinforcement Learning

The minimum qualifications for position 1 include a Master's degree in related fields including but not limited to:

- Mechanical Engineering
- Aerospace Engineering
- Electrical Engineering
- Mathematics
- Computer Science
- A related field that you may justify

The minimum qualifications for position 2 include a bachelor's degree in the same areas.

Students will be evaluated based on the following qualifications or abilities:

Figure 1: Overview of AI Institute, one of the projects funding a position

- Academic preparation
- Related industry or research experience, skills, & potential
    - Algorithm development
    - Ability to ask fundamental questions and articulate evaluation criteria
- Writing, speaking, teaching abilities
- Independence, maturity, perseverance, responsibility, creativity, curiosity, passion, ambition
- Abilities in team work, community engagement (within or outside academia), and supporting justice, diversity, equity, and inclusion

Why should you apply?

- Desire to pursue PhD in machine learning and space applications (marketable and high paying jobs post-degree)
- Guaranteed stipend and tuition waiver to UH
- Ability to work and live in Hawai'i
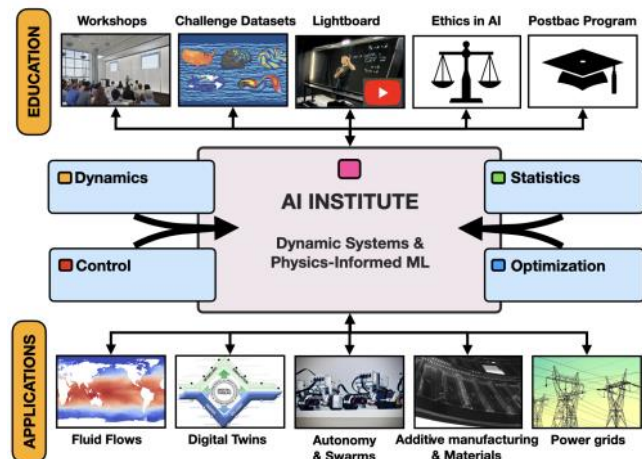- High energy, inclusive lab and mentor

To respond to this call, email Dr. Frankie Zhu (zhu@higp.hawaii.edu) and Dr. Zhuoyuan Song (zsong@hawaii.edu) your CV and your earliest start date. A cover letter would be nice but is not necessary.

If you're currently an undergraduate, application deadlines for the 2023 fall semester are January 15th for International student and March 1st for Domestic students. https://manoa.hawaii.edu/graduate/mechanical-engineering/

For more information on Dr. Zhu:
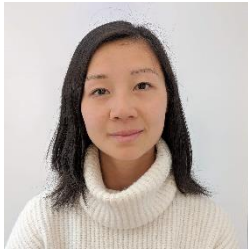
Dr. Zhu is an assistant professor at the University of Hawai'i (an R1 institution) in the Hawai'i Institute of Geophysics and Planetology. She got her PhD at Cornell University in Mechanical and Aerospace Engineering, with a minor in Computer Science. Her research focuses on integrating planetary science instrument data, robot motion, and machine learning algorithms for above surface terrain and underwater vehicles. Topics of interest include robotic morphology design and fabrication, deriving dynamics and control toward autonomy, machine learning theory and implementation, and field testing in extreme environments. Dr. Zhu is an early career female engineer and is passionate about justice, equity, diversity, and inclusion. She has cooperating graduate faculty status with Mechanical Engineering, Electrical Engineering, Information and Computer Science, and Earth Science.

Visit Dr. Zhu's website for more details (https://franceszhu.space/projects).

For more information on Dr. Song:

Zhuoyuan Song received his M.S. (2014) and Ph.D. (2018) in Mechanical Engineering from the University of Florida where his research foci included the localization of mobile robots in GPS-denied environments and decentralized control of multi-robot systems under strong influences of background flows. His research experience also includes prototyping and testing of autonomous underwater vehicles and developing visual guidance solutions for computation-limited mobile robots. In August 2018, he joined UH and founded the RAN LAb. He has cooperating graduate faculty status with the Ocean and Resource Engineering Department.

Visit Dr. Song's website for more details (https://www2.hawaii.edu/~zsong/).