

# Zihui(Andy) Liu

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## EDUCATION

### University of Washington, Seattle, WA

M.S. in Applied Computational Mathematics

Expected: June 2024

### University of Washington, Seattle, WA

B.S. in Computer Engineering (ABET Accredited)

June 2022

B.S. in Atmospheric Science: Data Science

June 2022

Minor in Mathematics

January 2020

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## EXPERIENCE

### Graduate Research and Master's Thesis with Dr. Dale Durran

January 2023 — Present

- Implemented preprocessing algorithms to fill and filter Outgoing Longwave Radiation (OLR) satellite data from ISCCP HXG for the subsequent process.
- Incorporate real-world OLR data into machine learning algorithms to improve prediction accuracy.

### Graduate/Undergraduate Research with Dr. Robert Wood

Graduate Research Assistant

September 2022 — Present

Undergraduate Research Assistant

October 2021 — September 2022

- Implemented machine learning algorithms (e.g., GRU, LSTM) to predict low marine cloud coverage in the Lagrangian specification.
- Implemented bias filters in various methods to improve machine learning output.
- Applied the algorithms above to perturbation-sensitivity studies, blank-filling meteorological measures, etc.

### UW Human Powered Submarine

Honorary Lead

September 2022 — Present

- Advised and transferred knowledge to new student leads and general members.
- Led the projects in Safety and Electronics Subsystem.

Safety Subsystem Lead

June 2021 — June 2022

- Upgraded the old safety system with an electronics-assisted safety system.
- Conducted a series of tests on the safety system, including battery, waterproofing, emergency fail-safe tests, etc.
- Educated the new general members about the subsystem and skills needed to design and fabricate parts.

Electronics Subsystem Project Manager

September 2018 — June 2021

- Designed and built the hardware for the control system of the submarine.
- Assisted in coding the control software and libraries.

- Retrofitted the mechanical joystick with hall-effect sensors for digital outputs. Modeled and manufactured the centering mechanism to improve the usability of the joystick.

**Safety Subsystem General Member** **September 2020 — June 2021**

- Maintained the safety mechanism in the submarine.
- Researched the pneumatic-hydraulic (air over fluid) hybrid system for actuators.

**Manufacturing Subsystem General Member** **September 2018 — June 2019**

- Learned machining techniques for manual and CNC mill and lathe.
- Machined the parts for other subsystems.

**WxChallenge** **September 2022 — June 2023**

- Competed in WxChallenge, a collegiate-focused meteorological forecast competition.
- Predicted max/min temperature, 2-min average wind speed, and precipitation of the cities in North America.

**UW Design Build Fly**

**Score Optimization Sub-team Lead** **September 2019 — December 2022**

- Modeled and ran an optimization algorithm (primarily genetic optimization) at the beginning of the academic year to maximize the competition score under several constraints: competition requirements, different materials, designs, etc.
- Used machine learning algorithms (e.g., k-mean cluster) to process raw output from optimization algorithms.
- Introduced and educated other general members about the score optimization project and various optimization algorithms.

**Mold Preparation Project Lead** **September 2021 — June 2022**

- Researched the manufacturing process of composite mold (vacuum bagging, autoclave, etc.)
- CNC routed the high-density foam and prepared it for the autoclave process.

**Manufacturing Sub-team General Member** **September 2019 — June 2021**

- Fabricated RC aircraft, including woodworking, 3d printing, and composite layering.

**UW Concrete Canoe**

**Construction General Member** **September 2018 — June 2019**

- Made a canoe out of concrete to compete with other teams at regional and national levels.

**Mix Team General Member** **September 2018 — June 2019**

- Helped to design and test the concrete formula for the canoe.

**Undergraduate Research Assistant with Dr. Gerald Pollack** **March 2019 — January 2020**

- Experimented and collected data about the distinctive patterns of the exclusion zone of water between two electrodes.
- Designed and manufactured a custom rig to record videos of experiments.

## **HONORS AND AWARDS**

- FURE's International Submarine Race 17 (2023), with UW Human Powered Submarine
  - Second Place in Overall Performance
- IMarEST's European International Submarine Races 2022, with UW Human Powered Submarine

- Fourth Place in Overall Performance
  - Award for Perseverance
  - Second Place in Agility
  - Ninth Place in AIAA's Design/Build/Fly 2022, with UW Design Build Fly
  - FURE's Virtual International Submarine Race 16 (2021), with UW Human Powered Submarine
    - First Place in Human Factor Engineering Design Process
    - First Place in Future Submarine Technical And Design Challenge
    - First Place in Maneuvering and Control Design
    - First Place in Operational Problem Solving Challenge
    - Second Place in Drivetrain Design
  - IMarEST's European International Submarine Races 2020, with UW Human Powered Submarine
    - First Place in the Design Challenge
  - First Place in ASCE's Pacific Northwest Regional Concrete Canoe Competition 2019, with UW Concrete Canoe
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## SKILLS

- **Programming Languages:** C/C++, Python, Java, MATLAB, Objective Pascal
  - **Software:** PyTorch, TensorFlow, scikit-learn, Unity Engine
  - **Hardware:** Embedded Systems, Digital Circuits, SystemVerilog, ModelSim
  - **Machining and Fabrication Skills:** Mill, Lathe, Composite Manufacturing, 3D-printing, Soldering, Carpentry
  - **Computer-Aided Design:** SolidWorks, Fusion 360
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## LANGUAGE

- English (Proficient), Chinese (Native)