Yuechuan Hou

Pittsburgh, PA
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Education

Carnegie Mellon University **Aug 2022 – Expected May 2024**
Master of Science in Mechanical Engineering, GPA: 3.87/4.0 *Pittsburgh, PA*

- Research advisor: Sebastian Scherer (AirLab, Robotics Institute)

University of Pittsburgh **May 2021**
Bachelor's in Mechanical Engineering, GPA: 3.97/4.0 *Pittsburgh, PA*

- **Minor in Computer Science**
- Honor Student, Swanson School of Engineering
- Graduated Summa Cum Laude

Sichuan University **Jun 2021**
Bachelor's in Mechanical Engineering *Chengdu, China*

Technical Skills

- **Programming Languages:** Python, C++, Java
- **Robotics and Simulation:** ROS, Isaac Sim
- **Engineering Analysis:** MATLAB, ANSYS
- **CAD:** SolidWorks, NX, CATIA

Relevant Coursework

- Data Structures
- Algorithm Implementation
- Engineering Computation
- Mobile Robots
- Visual Learning and Recognition
- Computer Organization and Assembly Language
- Artificial Intelligence and Machine Learning

Research & Projects

Dense 3D Reconstruction of Dynamic Actors in Natural Environments using Multiple Flying Cameras (Project Funded by National Science Foundation Grant No. 2024173) **Aug 2022 – Expected May 2024**
Research Assistant *Pittsburgh, PA*

- **Formation Planning:** Designed algorithms for adaptive aerial formation planning to optimize coverage of moving groups of people based on Python and ROS.
- **Field Testing:** Developed and executed planning and control strategies for aerial robots equipped with a GPS-based tracking model to film individuals in motion. Overcame challenges in synchronization and data integrity, ensuring robust data collection across various environmental conditions.
- **3D Reconstruction:** Implemented human pose detection using OpenPose with photo-realistic simulation via Isaac Sim and progressed towards a comprehensive 3D pose reconstruction pipeline.

Advanced Cross-Platform Game Porting of 'Metal Slug' with C++ and OpenGL **Jan 2023 – May 2023**
Team Leader *Pittsburgh, PA*

- **Game Adaptation:** Transitioned 'Metal Slug' to modern platforms using C++ and OpenGL enhancing gameplay functionality and compatibility.
- **Game Design:** Designed intricate gameplay mechanics and graphics, delivering an immersive user experience through algorithms.
- **AI Integration:** Integrated AI-driven enemy behaviors and dynamic difficulty scaling based on player performance to maintain a balanced gameplay experience.

Optimization of Thermal Mechanical Properties of 3D Printed Lattice Cooling Structures Using High Temperature Alloys (Project Funded by National Natural Science Foundation of China) **Jul 2021 – Jul 2022**
Research Assistant *Chengdu, Sichuan*

- **Deep Learning Modeling:** Designed deep learning models to precisely predict heat transfer properties in different lattice structures, establishing the relationship between the geometric parameters of lattice structures and the overall thermal conductivity efficiency.
- **System Optimization:** Applied genetic algorithms to optimize the heat transfer efficiency.
- **Algorithm Verification:** Employed regression models to ensure the precision and robustness of algorithms for real-world applicability.

Magnetically Assisted Binder Jet Printing of Magnetic Materials **Jan 2021 – May 2021**
Team Leader *Chengdu, Sichuan*

- **Prototype Automation:** Fully automated a binder jet printer and produced a prototype that could be tested for magnetic alignment.
- **Control Algorithm:** Developed C++ algorithms to issue commands and oversee printer rotor rotations, enhancing print precision and alignment.
- **Material Analysis:** Investigated the influence of 3D binder jet printing on magnetically enhanced metals and their subsequent effects on the properties of Magnetic-Shape Memory Alloys (MSMAs).

Development of a Lung Capacity Testing Device for COVID-19 Assessment **Sep 2020 – Dec 2020**
Team Leader *Pittsburgh, PA*

- **System Integration:** Designed and built the system, its circuitry, and developed the computer code to measure a person's peak lung flow and total volumetric flow.
- **Data Analysis:** Created the data acquisition program in MATLAB to record data and calculate mean breath force, peak breath force, and total volumetric flow; conducted analysis in measurement device uncertainty.

Teaching Experience

Teaching Assistant **Sep 2021 – Feb 2022**
MEMS1042 - Mechanical Measurement 2 *Chengdu, Sichuan*

- Tutored students on designing experiments, processing data, conducting error analysis, and completing reports.
- Assisted in creating and grading homework, ensuring a fair assessment of student knowledge and progress.
- Provided assistance to students during office hours, enhancing their understanding of key concepts and methodologies.

Professional Experience

Siemens Smart Manufacturing Innovation Center Chengdu **Jul 2019 – Aug 2019**
Intern *Chengdu, Sichuan*

- Utilized NX to address practical problems in mechanical engineering