Feiya Zhu

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA, US
M.S. in Mechanical Engineering - Research, Robotics   *GPA: 3.96/4.0*   *2024*
Courses: Computer Vision, Localization/Mapping, Visual Learning/Recognition, Linear Control Systems, Deep Learning, Machine Learning for Engineer, Engineering Computation

Kettering University — Flint, MI, US
Bachelor of Science in Mechanical Engineering - Automotive   *GPA: 3.51/4.0, cum laude, Dean's Lists*   *2019*
Thesis: Thermal Management Study on Climate Control Seating Design
Advisor: Dr. Susanta Das, Sponsor: Gentherm

Esslingen University of Applied Sciences — Esslingen, Germany
Bachelor of Science in Mechanical Engineering - Automotive, Kettering Engineering Exchange Program   *2018*

PUBLICATION

- **Under Review**: **Feiya Zhu**, Shuo Hu, Letian Leng, Alison Bartsch, Abraham George, Amir Barati Farimani, "Pour me a drink: Robotic Precision Pouring Carbonated Beverages into Transparent Containers", arxiv.org/abs/2309.08892, 2023
- **Electrochimica Acta**: Gianfranco DiGiuseppe, Allen Hunter, **Feiya Zhu**, "Combined equivalent circuits and distribution of relaxation times analysis and interfacial effects of $(La_{0.60}Sr_{0.40})_{0.95}Co_{0.20}Fe_{0.80}O_{3-x}$ Cathodes", doi.org/10.1016/j.electacta.2020.136252, 2020

RESEARCH EXPERIENCE

Carnegie Mellon University — Pittsburgh, PA, US
Research Assistant, Advisor: Professor Amir Barati Farimani   *Sep 2022 - Present*

- Researching robotic manipulation of transparent objects using Franka-Emika robot arm, integrating singular vision-based Nerf 3D reconstruction along with Vision-Transformers. This ongoing project has potential applications in assistive robots, enabling them to perceive transparent objects in dynamic environments using only an RGB camera.
- Conducted research on robotic liquid manipulation with the Franka-Emika robot arm, implemented computer vision and artificial intelligence approaches (FCN, YOLO). Manuscript submitted for publication; the project demonstrates a zero-shot robotic precision pouring pipeline for a diverse range of carbonated and non-carbonated beverages into transparent containers.
- Selected as a reviewer for ICRA 2024.

Kettering University — Flint, MI, US
Research Assistant, Advisor: Professor Gianfranco DiGiuseppe   *May 2019 - Sep 2019*

- Investigated the electrochemical properties of LSCF cathodes under varying firing temperatures for Solid Oxide Fuel Cell (SOFC), led to a published paper. This research enhances the understanding of cathode behavior in SOFCs under different thermal conditions.
- Performed detailed Electrochemical Impedance Spectroscopy (EIS) analysis, including the collection of fabricated SOFC impedance measurements. This hands-on experience enhanced skills in experimental design, data interpretation, and analytical techniques.

ACADEMIC PROJECTS

- **Autonomous Vehicle Control and Planning**: Designed and implemented advanced feedback control systems, including PID, Pole Placement, LQR, and Kalman Filter, to enable precise control of a Tesla Model 3 in Webots. (Fall '23, Projects for *Linear Control Systems*)
- **SLAM On Wheeled Robot Under Shaky Robotic Motion**: Developed a robust fusion framework incorporating IMU and LiDAR Odometry in a Gazebo simulated environment. Implemented LOAM and GT-SAM for effective SLAM on a wheeled robot, addressing challenges posed by shaky robotic motion. (April '23, Final Project for *Localization/Mapping*)
- **Facial Emotion Recognition & Classification**: Achieved real-time human facial emotion recognition and prediction of facial expressions using a trained CNN on AffectNet, leveraging 291,650 face images and 8 emotion labels. (Dec '22, Final Project for *Deep Learning*)
- **Manic Shooter Game**: Led a team in the development of a dynamic manic shooter game using C++ and OpenGL. Managed all aspects, including design, programming, animation, and sound effects. Successfully delivered as the final project (Dec '22, Final Project for *Engineering Computation*)

Work Experience

Carnegie Mellon University — Pittsburgh, PA, US
Teaching Assistant — *Sep 2023 - Present*

- Assisting Prof. Nestor Gomez in teaching *24-780 Engineering Computation.* Responsibilities include guiding engineering students in learning C++ and OpenGL utilization.

Biaode Engineering — Guangzhou, China
Project Manager — *Dec 2020 - May 2022*

- Served as project manager for the three main projects:
  * Instrumental construction and training project at the Qingyuan Senior Technical Institute (2 million CNY).
  * Recreational construction project at the Qingyuan Correctional Facility (3 million CNY).
  * Information technology construction project at Lianshan Technical School (320,000 CNY).
- Led end-to-end management of construction projects, from crafting detailed proposals and formulating construction schedules to budgeting, sourcing materials, and assembling project teams.
- Managed the collaboration with clients, architects, and subcontractors, ensuring transparency and alignment of goals. Conducted regular progress meetings to maintain open communication on project advancements. Performed routine on-site visits to monitor progress and uphold stringent quality control measures.

Bucalu Fenestration Systems — Guangzhou, China
Product Development Engineer — *Oct 2019 - Nov 2020*

- Led the end-to-end development of the company's inaugural parallel outward-opening window system, overseeing design, development, validation, and the successful creation of a prototype.
- Applied structural, noise and thermal analysis techniques to optimize fenestration products, ensuring precise technical drawings (AutoCAD/SOLIDWORKS) for prototype construction and testing.
- Implemented a customer-centric approach by delivering tailored product solutions for specific customer and tendering project requirements.
- Collaborated across departments to guarantee the quality of product components provided by OEMs. Conducted comprehensive property testing, evaluating dimensions, shear/tensile/hardness, and coating corrosion resistance, adhering to both design requirements and national standards.

Gentherm — Novi, MI, US
Product Development R&D Co-Op — *July 2016 - Sep 2018*

- Led comprehensive research on contemporary seating design approaches through a series of thermal experiments and structural analyses. This research played a pivotal role in informing the development of the Gentherm Climate Control Seat (CCS) system. The insights gained from this investigation served as the foundational research for my undergraduate thesis.
- Engaged in the design, development, and testing of the Gentherm Climate Control Seat system, collaborating on the construction of prototypes for major vehicle companies such as Ford, General Motors, and BMW. Developed expertise in product development, testing and validation.

Honers & Awards

- **2023 ATK-Nick G. Vlahakis Graduate Fellowship**: Nominated as one of the two Master's students from CMU MechE department for the College of Engineering-level fellowship.
- **2018 Oswald Student Fellowship**: Recognized for academic excellence, leadership, and service with the Oswald Student Fellowship, receiving an award of $2,500.
- **2016 - 2018 Kettering International Scholarship**: Merit-based scholarship recipient, totaling $2,850, in acknowledgment of outstanding academic achievements as an international student.
- **2015 - 2019 Kettering World Scholarship**: Acknowledged for academic excellence as an international student, awarded a total of $12,500 in the form of the Kettering World Scholarship.
- **2015 - 2019 Kettering Bulldog Grant**: Recipient of the Kettering Bulldog Grant, totaling $25,000, in recognition of exceptional academic merit and contributions as an international student.

Skills Summary

- **Mechanical Engineering**: Controls, Product Design & Structure Analysis, FEA, Thermodynamics & Fluids, 3D Printing, CNC Machining
- **Robotics**: Machine Learning, Deep Learning, SLAM, Computer Vision
- **Engineering Tools**: Python, C++, OpenGL, PyTorch, ROS, Pandas, NumPy, Matplotlib, AutoCAD, SOLIDWORKS, Siemens NX, Ansys, MATLAB