Xuzhe Zeng

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EDUCATION

Carnegie Mellon University | GPA: 3.86/4 Pittsburgh, PA

Master of Science in Mechanical Engineering May 2026

Selected Coursework: Machine Learning with Large Dataset, Additive Manufacturing, Deep Learning

Chang'An University / University College Dublin | GPA: 3.87/4.2 Xi'an China

Bachelor of Engineering June 2024

Selected Coursework: Solid Mechanics, Computational Fluid Dynamics, Design, System Modelling & Simulation

ITNERNSHIP EXPERIENCE

Porsche Remote | Shanghai, China Aug. 2022 - Sept.2022

- Summarized and analyzed the project mission to improve procurement efficiency and clarify project goals for all stakeholders
- Mastered the understanding and the use of various relays to design circuits with different functionalities
- Drafted schematic circuit diagram and collaborated with other parts to successfully achieve clients' mission statements

Institute of Automation, Chinese Academy of Sciences Researcher | Beijing, China July 2022 - Aug.2022

- Wrote C++ programs in Arduino for remote control of the unmanned vehicle in different directions via a joystick
- Utilized MATLAB to adjust the value of PID parameters to enhance the accuracy of the vehicle in a straight line
- Assembled the structure and burned the programs into the receiver board to verify each functionality

RESEARCH EXPERIENCE

Airborne Acoustic Emission for Porosity Quantification in LPBF Dec. 2024 – Aug. 2025

Advisor: Levent Kara (Professor of Mechanical Engineering Department, Carnegie Mellon University)

- Conducted research on airborne acoustic emission to enable sub-scanline quantification of keyhole porosity in laser powder bed fusion (LPBF)
- Designed and implemented machine learning pipelines for effective process characterization and porosity prediction
- Collaborated with a multi-disciplinary team, contributing as second author to a peer-reviewed publication

Machine Learning in predict and visualize melt pool Aug. 2024 - Dec. 2024

Advisor: Levent Kara (Professor of Mechanical Engineering Department, Carnegie Mellon University)

- Collected and processed acoustic and photodiode signals under varying printing conditions in laser powder bed fusion (LPBF)
- Developed and trained multiple deep learning pipelines with Principal Component Analysis (PCA) preprocessing
- Compared and evaluated the results using different performance indices and visualized the melt pool images for further analysis

Computational Dynamics: Modeling the Dynamics of Cars Aug. 2021 - Oct.2021

Advisor: Eric Darve (Professor of Mechanical Engineering Department, Stanford University) Remote

- Simplified car model dynamics by using vectors and matrices to establish equations linking forces to car parts
- Analyzed tire-road dynamics during turns and lane changes in BMW M3 and Chevrolet Cavalier
- Utilized Python to plot graphs of wheel forces in M3 and Cavalier, enhancing intuitive car performance and stability analysis

PUBLICATIONS

- Haolin Liu, Xuzhe Zeng, David Guirguis, Logan Maurer, Vigknesh Rajan, Niloofar Sanaei, Chi-Ta Yang, Jack L. Beuth, Anthony D. Rollett, and Levent Burak Kara. Airborne acoustic emission enables sub-scanline keyhole porosity quantification and effective process characterization for metallic laser powder bed fusion. arXiv preprint arXiv:2508.13492, 2025.
- Xuzhe Zeng (first author), Analysis of Tire Forces in Cornering Situations Using Python Modelling. The 2nd International Conference on Mechanical Engineering, Intelligent Manufacturing and Automation Technology. January 2022

PROJECTS

Simulation and optimization of mechanical connection process - University College Dublin Feb. 2024 - June 2024

- Proposed a concept for the parameterization of the die in SPR process to simplify the complexity of die model establishment
- Designed a set of methods to evaluate the performance of dies effectively to facilitate the assessment of different dies
- Utilized Simufact.forming for SPR simulation on each die and conducted selection process to selected the most suitable die

Personal Mobility Device for People with Disabilities - University College Dublin Mar. 2023

- Developed a wheelchair design tailored for disables by creating PUGH matrix based on technical requirements
- Created a wheelchair model in CATIA with assembly animations and exploded views to showcase its design and features clearly
- Determined part design and sourcing for compatibility, with stress analysis through Solidworks and CATIA to ensure durability

Design and build a simple vehicle (Group project) - University College Dublin Sept.2023 - Nov.2023

- Collaborated with other teammates to calculate and evaluate crucial parameters including frame and power system of the vehicle
- Modeled the vehicle in Solidworks and optimized the design through simulations, enhancing strength and preventing fractures
- Collaboratively constructed the vehicle by purchasing each component and material, followed by welding and precise assembly

SKILLS

Programming Language: Python, C++

Software: Solidworks, ANSYS, Catia, MATLAB, Simufact.forming, Inkscape

Language: Mandarin, English