# Ruizhe Zhao

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## Education

**University of Washington - Seattle** Seattle, WA
*Master of Science in Mechanical Engineering* *10/2021 – present*

- GPA: 3.8/4.0
- Courses: Linear System; Adaptive Control; Advanced Engineering Mathematics; Parallel Computing; Machine Learning with Dynamic System

**Oregon State University** Corvallis, OR
*Bachelor of Science in Mechanical Engineering* *10/2016 – 6/2020*

- Cumulative GPA:3.34/4.0; Major GPA: 3.50/4.0
- Honor Roll for 7 terms
- Courses: Python; MATLAB; Applied Robotics; Control System; Statics, Dynamics; Thermal dynamics; CAD, CAM and FEA; Instrumentation and Measuring System; Material Science

## Skills

**Programming Languages**: Python, MATLAB, SIMULINK, Arduino
**Software**: Solidworks, Abaqus, Ansys
**Control System Theories**: Classical Control; Linear System; Adaptive control; Nonlinear Control; Data Driven Dynamics; State Estimation; Sensor Fusion

## Experience

**Mechanical Engineer** Shenzhen, Guangdong, China
*Shenzhen Grepow Battery co. ltd* *3/2021 – 9/2021*

- Designed and built a prototype of LiPo battery enclosure
- Collaborated with electric engineer to finalize the PCB board layout and heat sink specification
- Output photo-realistic rendering images and engineering drawings
- Acquired knowledge on LiPo batteries and BMS

## Projects

**PACCAR Vehicle Range Estimation** | *Matlab, Linear Regression, Machine Learning* 2/2022 – Present

- Developed a tool in MATLAB to estimate the range of electric truck using drive cycle data
- Built a vehicle physics modeling using linear regression and boosted decision tress methods
- Improved the training process by using CV partition that randomized the training samples
- Modeled the current limit of the vehicle regenerative braking using polynomial fitting.
- The trained model was verified on multiple test data sets to have 96% prediction accuracy of the energy consumption.

**Meltybrain Combat Robot** | *Solidworks, Arduino, Python* 6/2020 – 11/2020

- Designed and built a 3lb translational drift (Meltybrain) combat robot
- Developed the program in Arduino to deal with the communication among accelerometer, IR receiver, Remote Control IBus receiver, Bluetooth module and Dshot600 Electronic Speed Controller using different protocols.
- Developed the motion model of the robot in Python to compute the rotational speed and heading angle based on real-time measurements.
- Used Solidworks Simulation to optimize the mechanical structure to maximize rotational momentum per weight. At max throttle it can store 130J of kinetic energy and blade tip speed at 80mph
- Participated in Seattle Bot Battles 2022: 3 wins, 2 losses

**Beaver Racing Baja SAE** | *Solidworks, Matlab* 09/2019 – 06/2020

- Developed a system to estimate load on tie rod of a Baja race car at varies shock travel
- Generated geometry data for existing suspension models from Solidworks by using Macro and Motion Simulation
- Estimated the typical acceleration and weight distribution for different driving scenarios
- Used MATLAB to calculate suspension link load by using matrix manipulation
- Output the result as a readable interface in Excel sheet