

# VIVIAN ZHOU

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## EDUCATION

**B.S. Mechanical Engineering, Minor in Computer Science**, UC Davis, GPA: 3.35

Graduation: Dec. 2019

**M.S. Mechanical and Aerospace Engineering**, UC Davis, GPA: 3.95

Expected Graduation: Jun. 2021

## SKILLS

**Technical Skills:** SolidWorks, GD&T, FEA, LabView, MATLAB, Machine Tool Technology, ESPRIT, Bond Graphs, C, C++, R, Python, Java, Computer Architecture (x86 Assembly), Digital Circuits, Multilingual (Shanghainese & English)

## ENGINEERING EXPERIENCE

**Advanced Research of Manufacturing Systems (ARMS) Laboratory**, UC Davis

Aug. 2017 – Present

*Graduate Researcher & Undergraduate Researcher*

- Research Focus: Design and implement a control system that aids in the height compensation of the direct energy deposition metallurgy 3D printing process. Height compensation is necessary due to heat accumulation and inconsistent laser head feed rate causing undesired changes in the part geometry during deposition.
- Developed a height monitoring device through the use of a camera and computer vision programming to gather height data for a proportional height controller that will adjust the powder flow through a dynamic powder splitter.
- Full autonomy over project development including research, concept generation, SolidWorks 3D modeling and simulation, Python and Arduino programming, and comprehensive system testing.

**Verb Surgical**, Mountain View, CA

June 2019 – Sept. 2019

*Engineering Intern*

- Designed, prototyped, and implemented sheet metal brackets for mounting critical components on a robotic system. Performed project management duties in order to delegate tasks and maintain a specific project timeline.
- Conducted tolerance stack analysis of critical components to identify manufacturing interferences.
- Designed, prototyped, and released into a quality management system (QMS) an integrated protective circuit for the power system of a robotic system. Created a technical review that was presented to various engineering teams.
- Identified limitations of a current backlash and stiffness testing set-up and designed a fixturing assembly to aid in the accuracy and efficiency of the testing of a mechanical assembly.

**IDEX Health & Science**, Rohnert Park, CA

June 2018 – Sept. 2018

*Mechanical Engineering Intern*

- Performed life cycle, pressure, and thermal testing in the R&D laboratory on valve products. Analyzed data according to DFMEA and wrote test plans and reports for all experiments.
- Conducted root cause analysis on a defect in vacuum pumps that caused a high return rate due to early failures and proposed manufacturing solutions to reduce return rate by 40%.
- Designed and prototyped a hinge lid and fixtures to be used in an HPLC prototype machine, using Reaction Injection Molding and Thermoforming design considerations as well as DFM.
- Organized a design of experiments (DOE) to test for pressure rating, rotor seal material and stator boss diameter on 36 valves which will facilitate valve designs by creating a reference for a range of each characteristic to pair to specific consumer needs.

## ENGINEERING PROJECTS

**Autonomous Agricultural Robot Simulation**

Mar. 2020 – June 2020

- Implemented a kinematic pure-pursuit controller and an extended Kalman filter for state estimation to accurately navigate a mobile robot through narrow rows of trees while collecting information from a simulated bitmap.
- Performed remote sensing using a LiDAR model and computer vision to estimate diameter and position of trees.
- Simulated the model in 3D using Gazebo to implement real-world characteristics and aid in visualization.

**Small-Scale Toy Sorting Robotic System**

Mar. 2020 – June 2020

- Designed and fabricated a dual robot system consisting of a mobile robot and a stationary robot. The system utilized light and infrared sensors to detect, collect, and sort objects by color into different bins.

## ACTIVITIES

- Theta Tau, Professional Engineering Fraternity, *President* Jan. 2017 – Jun. 2017
- Study Abroad: Thermodynamics in Reykjavik, Iceland, *Student* Summer 2017
- Hobbies: Traveling, houseplant care, gaming, hiking, mechanical keyboards, reading, and trying new things!