

# Zihao Xu

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## EDUCATION

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<b>Aug 2020 – Present</b>	<b>Purdue University</b> <ul style="list-style-type: none"><li>• Major: Mechanical Engineering</li><li>• Cumulative GPA: 3.96/4</li><li>• Selected Courses: Artificial Intelligence, Autonomous Systems, Theory and Design of Control Systems, Data Analytics for Engineers, Deep Learning, Digital Image Processing, Adaptive Control, Modern Automatic Control</li></ul>	<b>School of Mechanical Engineering</b> Non-Thesis Master
<b>Aug 2019 – May 2020</b>	<b>Purdue University</b> <ul style="list-style-type: none"><li>• Major: Mechanical Engineering</li><li>• Cumulative GPA: 3.91/4</li><li>• Selected Courses: Mechanical Vibration, Numerical Methods in Mechanical Engineering, Microprocessor and Electromechanical Systems, Linear Algebra, Engineering Design</li></ul>	<b>School of Mechanical Engineering</b> Exchange undergraduate student
<b>Sep 2016 – Aug 2019</b>	<b>Shanghai Jiao Tong University</b> <ul style="list-style-type: none"><li>• Major: Mechanical Engineering</li><li>• Cumulative GPA: 3.52/4</li><li>• Selected Courses: Principles and Practice Using C++, Theoretical Mechanics, Design and Practice of Mechatronic Systems, Robotics, Modeling Analysis and System Control</li></ul>	<b>School of Mechanical Engineering</b> Undergraduate student

## RESEARCH EXPERIENCE

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### **Jul 2021 – Present     UAV Obstacle Avoidance and Collaboration with Autonomous Boats**

Graduate research program of Mechanical Engineering at Purdue University

Advisor: **Prof. Nina Mahmoudian**, Associate Professor of Mechanical Engineering at Purdue University

- To develop and implement the vision-based obstacle avoidance algorithms for a quadcopter.
- To develop the functions for collaborative work with autonomous boats such as guiding the boats where required.

### **Aug 2021 – Present     Geometric Optimization in Computer Aided Design**

Graduate research program of Mechanical Engineering at Purdue University

Advisor: **Prof. Karthik Ramani**, Professor of Mechanical Engineering of Purdue University

- To implement B-spline fitting for free curves in hand sketches, including resampling and determining curve orders.
- To optimize the parameters in the precise descriptions obtained from hand sketches for assigned design objectives.

### **Jan 2020 – May 2020     Design of Annular Traverse System for Zucrow Lab of Purdue**

Project for capstone course of Purdue Mechanical Engineering

Advisor: **Prof. Guillermo Paniagua**, Professor of Mechanical Engineering of Purdue University

- Designed a unique and relatively cheap annular traverse system for the wind tunnel in Zucrow Lab of Purdue, which required the traverse system to have high resolutions and the ability to withstand high temperature and air pressure while preventing air leakage.
- Validated the whole system in **SolidWorks**, created the explosive view and dynamic analysis, and decided the manufacturing method or source of supply of the system.
- Won the **Best Engineering Prize** in Malott Innovation Award of Mechanical Engineering.
- The traverse system is now being brought to reality in Zucrow Lab by faculties working there.

### **Aug 2019 – May 2020    Hybrid Electric Vehicle Control**

Undergraduate research program of Mechanical Engineering at Purdue University

Adviser: **Prof. Peter Meckl**, Assistant Head and Professor of Mechanical Engineering at Purdue University

- Debugged the **Equivalent Consumption Minimization Strategy (ECMS)** and **Partial State of Charge (PSoC)** in Simulink and proved its feasibility by comparing it with the benchmark.
- Located the abnormal vibrations in previous implementations by tracking the data flow and proposed to fix the data acquirer at the acceleration pedal.

### **Jun 2019 – Aug 2019    Robust Proprioceptive Robot Impact Detection**

Summer Internship in SJTU Robotics Lab

Adviser: **Prof. Jianhua Wu**, Associate Professor in Robotics Lab of SJTU

- Designed a serial of moving path and moving speed for an industrial 6-DOF robot arm and implemented them using **SIMULINK** to obtain torque information of every joint in different operating conditions.
- Managed to let the dynamic threshold follow the torque curve well in certain operation conditions by minimizing the area between the threshold and torque curve using **MATLAB**.
- Applied **Regression with Least Square Estimation (RLSE)** to the detector to estimate different parameters needed in various operation conditions online.

## **SERVICE**

Sep 2016 - Jun 2019	School of Mechanical Engineering of SJTU	Class Representative
	<ul style="list-style-type: none"><li>• Conveyed various information about activities, new policies, and tests to classmates.</li><li>• Collected students' votes, opinions, and information.</li><li>• Helped classmates solve various problems, ranging from study to daily life.</li></ul>	
Sep 2016 - Jun 2019	Student Science and Technology Innovation Association	Leader of Publicity Team
	<ul style="list-style-type: none"><li>• Invited professors and organized workshops for new students</li><li>• Was responsible for the devices used in the robot designing competition.</li><li>• Assigned work and organize various training class of skills for the department.</li><li>• Obtained excellent leader honor when holding the competition for new students.</li></ul>	

## **SKILLS**

<b>Programming</b>	Python, C++
<b>Technical Tool</b>	MATLAB, ROS, SolidWorks, CAD, Git, LaTeX, PyTorch Arduino, Raspberry Pi, STM32
<b>Language</b>	Chinese: Native, English: TOEFL 105

## **SELECTED HONORS**

<b>May 2020</b>	Best Engineering Prize in Malott Innovation Award of ME in Purdue
<b>Oct 2018</b>	2018 Merit Student of Shanghai Jiao Tong University (3 out of 40)
<b>Oct 2018</b>	Nomination Award of Science and Technology Innovation Scholarship (Top 50 in SJTU)
<b>Aug 2018</b>	Special award in the 11 <sup>th</sup> national university student social practice and science contest on energy saving and emission reduction (Top 1, National)
<b>Oct 2017</b>	Academic Excellent Scholarship (Third-Class) of SJTU (30%)