# XUN
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Pursuing Master of Science in ECE
University of Michigan, Ann Arbor

## OBJECTIVE

Participate the research lab. Contribute my academic knowledge to design, test and deploy the algorithms

## EDUCATION

### Bachelor of Science | Shanghai Jiao Tong University

09/2017 – 08/2021

GPA: 3.73

Awards: 1. Silver award: 2021 Capstone Design Expo in Joint Institute in Summer 2. Silver award: 2018 World University Student Physics Competition 3. Scholarship: 2017 UM-SJTU Joint Institute Wu Jiong&Sun Jie Scholarship

Related Coursework: Control Systems Analysis and Design, Probabilistic Methods in Engineering, Programming & Elementary Data Structures, Discrete Mathematics

### Bachelor of Science | University of Michigan, Ann Arbor

09/2019 – 04/2021

GPA: 3.74

Honors: Magna Cum Laude in Bachelor of Science in Engineering

Related Coursework: Intro to Embedded System Design, Computer Vision, Digital Integrated Circuits, Computer Architecture, Logic Circuit Synthesis and Optimization

### Master of Science | University of Michigan, Ann Arbor

09/2021 –

GPA: 4.00

Related Coursework: Linear System Theory, Deep Learning method for Computer Vision, Robotics Kinematics, Mobile Robotics, Computational Methods in Data Science & Machine Learning

## EXPERIENCE

### Internship | *Jiyan Information Technology*, Shanghai

10/2018 – 07/2019

Helped to establish and manage the cafeteria takeaway group in the

dormitory; supervise on the distribution; communicate with the clients;

### Investigator | *Honor Council*, UM -SJTU Joint Institute

10/2018 – 07/2019

Investigate and evaluate the potential violations of Honor Codes; communicate with the related people

**Grader |** *EECS 478 for Fall 2021,* **EECS - Computer Science Engineering**
09/2021 – 12/2021
Grade the assignments and exams; communicate with students, GSI and professors about issues in solutions and the students' performances;

**Research Assistant |** *UM Ford Center for Autonomous Vehicles,* **University of Michigan, Ann Arbor**
05/2021 –
Participate in the project to build a dataset where SLAM algorithms can be tested and benchmarked. Help in collecting data, testing the proposed calibration methods, establishing the dataset and carrying out experiments with the existing SLAM algorithms;

## SKILLS

- Programming Languages: C++, Python, Java, Julia, Verilog/SystemVerilog
- Embedded System: Arduino, STM32
- Engineering Software: Matlab, Mathematica, Cadence, Docker
- Developing Platform: Linux, Git, ROS, Pytorch
- Language: English (TOEFL: 105+, GRE: quantitative: 169, qualitative: 155, Writing: 4.5

## ACTIVITIES

I have always kept the enthusiasm in robotics and autonomous system. In my high school, I obtained the chance to attend the Information Technology Summer Camp held by Peking University. Also, to solidate my fundamentals in mathematics and physics, I attended National Mathematical Olympics Competition and won first prizes twice.

 In my undergraduate years, apart from the diligent work in my course, I also engaged in different extracurricular activities or contests to explore more in the related fields. I joined in the college's science and technology association organization to communicate with other top students and improve myself. I also participated Freshman Robots Competition and 2018 World University Student Physics Competition to learn to apply theoretical knowledge in practice and carry out groupworks. Besides, I seized the precious chance to attend the Industrial Exhibition held in Shanghai to learn about the latest progress and challenges in Industry

After being admitted as a master student in Rackham Graduate school, University of Michigan, I continued studying in related fields. I have joined Prof. Chinedum Okwudire research lab in studying Feedforward Tracking Control of Nonminimum Phase (NMP) Systems in 3D printing. In which I gained experience in doing research and applying the knowledge from class in practice. Currently, I am working as a research assistant in UM Ford Center for Autonomous Vehicles in helping the project Dataset for SLAM algorithms in Adverse Conditions.

## PROJECTS

- **Dataset for SLAM algorithms in Adverse Conditions**
  Description: establish a sample dataset with images in various weather conditions, including rainy, foggy and etc; publish the dataset so that people could test their SLAM algorithms on it; also obtain some reference results using our own developed methods;

Role: help in collecting the data; test the calibration methods and process; test several existing SLAM algorithms and evaluate the performance;

■ **Improvement on ORB-SLAM2 Pipeline using Deep Learning Method (EECS 568/ROB 530, Mobile Robotics)**
Description: try to improve the old, useful SLAM algorithm called ORB-SLAM2 with several Deep Learning techniques
Role: improvement on image processing in Loop Closing component; develop a new Loop Closing method to equip with our own front-end;

■ **Feedforward Tracking Control of Nonminimum Phase Systems using Filtered Basis Function (Prof. Chinedum Okwudire's lab)**
Description: reduce the errors in 3D printing under a high speed by designing a feedforward controller using the developed Filter Basis Function method; extend the method to nonlinear system
Role: design and evaluate the techniques to apply the method to nonlinear systems

■ **BuilderX Excavator Prototype with Autonomous Obstacle Avoidance (VE 450, Capstone Design Project)**
Description: develop ideas based on an excavator prototype provided by BuilderX corp. about how to avoid the obstacle in the path automatically, using cameras
Role: robotics arm control; sensor deployments and noise filtering; motion planning algorithm development;

■ **P6 Style Out-of-Order Instruction Processor (EECS 470, Computer Architecture, Capstone Design Project)**
Description: develop a P6-sytle Out-of-Order instruction processor that can work correctly and efficiently on the provided programs
Role: benchmarking; design and test caches and other memory I/O parts;

■ **Improved AlexNet on Human Facial Expression Classification Task (EECS 442, Intro to Computer Vision)**
Description: develop a program using Alexnet to detect the human facial expression intelligently
Role: design and build the networks

■ **Mobile Car with autonomous Obstacle Avoidance and Phototaxi using STM32 (EECS 373, Intro to Embedded System)**
Description: develop a model car that can trace the light source and go there without colliding with the obstacle on the path
Role: develop the control programs on the board and test

■ **Multi-functional Baby Stroller (VG 100, Intro to Engineering)**
Description: develop a baby stroller with several extra useful features, such as automatic balancing on the slope, automatically closing the cloak and etc.
Role: develop methods and algorithms in automatic balancing