

# Yuanshao Yang

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## EDUCATION

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**Aug 2025 - Present**

Institute of Robotics and Intelligent Machines  
PhD, Robotics (Unit: Mechanical Engineering)

Georgia Institute of Technology, Atlanta GA

**Aug 2023 - May 2025**

Department of Mechanical Engineering  
BSE, Mechanical Engineering, *Summa Cum Laude*

University of Michigan, Ann Arbor MI

GPA: 3.956/4.000

**Sept 2021 - June 2025**

Sichuan University - Pittsburgh Institute  
BE, Mechanical Engineering

Sichuan University, Chengdu, China

GPA: 3.82/4.00

## HONORS & AWARDS

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Aug 2024, University of Michigan

**CoE Need and Merit-Based Scholarships** (\$2,000)

Mar 2025, University of Michigan

**James B. Angell Scholar**

Dec 2024 / June 2024 / Dec 2023, University of Michigan

**College of Engineering - Dean's List**

Dec 2024 / May 2024 / Dec 2023, University of Michigan

**University Honors**

Oct 2023, Sichuan University

**Dean's List** (10 % Annual Tuition, 30/230)

Oct 2022, Sichuan University

**Academic Star Scholarship** (20 % Annual Tuition, 3/230)

Oct 2022, Sichuan University

**Comprehensive Academic Scholarship, 2nd Prize** (TOP 4 %)

Oct 2022, Sichuan University

**Outstanding Student Leader of the Year**

## PROJECTS

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**Series Spring Design & Evaluation for Open-Source Leg**

July 2024 - Aug 2025

**Instructor: Dr. Elliott Rouse, Zachary Bons**

[Neurobionics Lab](#), University of Michigan

[GitHub Repository](#) Posted

Publication: Under **Review** [1]

- Generate a mechanical design of modular torsion spring architecture in series, with flexible mounting and better axial alignments
- Implement a computer vision-based approach for measuring precise deflection angles
- Assess mechanical performance characteristics at assembly interfaces including backlash and hysteresis, using analytical design methods and empirical model of spring rate profile
- Compare spring performance across different manufacturing batches from 2 suppliers
- Provide manufacturing guidance and design insights for compact elastic modules in wearable robotics applications

**Development & Motion Analysis of Robot Swimmer**

Dec 2023 - Aug 2024

**Instructor: Dr. K. Alex Shorter**

Mechanical Engineering, University of Michigan

[GitHub Repository](#) Posted

Publication: **Accepted** for Conference Proceeding [2]

- Design & optimize the E-coli based robot CAD model for 2-D motion in uniform, viscous flow
- Validate the mechanical design by CFD analysis
- Develop a path-planning algorithm for obstacle avoidance
- Design the feedback control model to perform reference tracking

## Clinical Data Analysis of Heart Disease

Mar 2022 - Jan 2023

Instructor: Dr. Xiaobo Zhou, Dr. Yuefu Zhan

Biomedical Big Data Center, West China Hospital, Sichuan University

[GitHub Repository Posted](#)

- Work on diagnostic data of cardiac patients through feature selection
- Develop a Random Forest regression model via Scikit-Learn and PyTorch in Python and use training data sets of clinical diagnostic data
- Test model performance on internal datasets from West China Hospital
- Perform interpretability analysis of built models using variable sensitivity analysis

## WORK EXPERIENCE

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### Instructional Aide of ME360 - System Dynamics

Aug 2024 - May 2025

Instructor: Dr. Uduak Inyang-Udoh (FA24), Dr. Christopher Vermillion (WN25)

Mechanical Engineering, University of Michigan

- Conduct office hours and address student questions both in-person and remotely
- Take trial exams and provide feedback on exam question design
- Support [Graduate Student Instructor \(GSI\)](#) with homework solutions
- Lead review sessions and prepare original review materials

## SKILLS

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- **General Programming:** C/C++, Python
- **Computation & Simulation Tools:** MATLAB & Simulink, MSC Adams, Ansys Mechanical
- **Data Science & Machine Learning Toolbox:** Scikit-Learn, PyTorch
- **Computer Vision:** OpenCV
- **Mechanical Design:** SolidWorks, AutoCAD
- **Embedded System Design:** Keil MDK, ARM Mbed, Arduino
- **Writing & Formatting:** LaTeX, Inkscape
- **3D Modeling:** Keyshot, Blender
- **Soldering:** Through-Hole Soldering, Surface-Mount Soldering
- **General Machining:** Milling, Lathing, 3D Printing, Waterjet Cutting

## PUBLICATIONS

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- [1] Zachary Bons<sup>†</sup>, Yuanshao Yang<sup>†</sup>, and Elliott J. Rouse. “Compact Modular Multi-Part Torsion Springs: Broadening the Design Space with Series Configurations”. *IEEE/ASME Transactions on Mechatronics (T-MECH)*. **Under Review**; <sup>†</sup>**Equal Contribution**. 2025.
- [2] Yuanshao Yang, Mingkai Xia, Naike Wu, Junhan Zhang, and K Alex Shorter. “Motion Analysis and Design of Bionic Swimming Robot”. *Proc. of 2024 IEEE International Conference on Cyborg and Bionic Systems (CBS 2024)*. **Accepted for Presentation**. Nagoya, Japan: IEEE, 2024.