Mo Yang

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RESEARCH INTERESTS

Optimal Control, Swarm Robotics, Geometric Control, Stochastic Optimization, Bio-mechanics

EDUCATION

University of Michigan, Ann Arbor, USA — Aug. 2023 — May. 2025
Bachelor of Science in Engineering in Data Science, Minor in Mathematics — Cumulative GPA: 3.92/4.00

Shanghai Jiao Tong University, Shanghai, China — Sep. 2021 — Aug. 2025
Bachelor of Science in Electrical and Computer Engineering — Cumulative GPA: 3.60/4.00

PUBLICATIONS

[1] Jiayi Zhao, **Mo Yang**, Jing Shuang (Lisa) Li. (2024). "Human Balancing on a Log: A Switched Multi-Layer Controller". Submitted to *American Control Conference*. Preprint available.
[2] **Mo Yang**, Dezhi Zhou. (2024). "Ignition Delay Prediction for Fuels with Different Molecule Structures Via a Transfer Learning Approach". Submitted to *Energy and AI*.

RESEARCH EXPERIENCE

"AtomBot" Swarm Robotics Project — Jan. 2024 — Present
Advisor: Y Z — University of Michigan, Ann Arbor, USA.

- Design and manufacture Atombots.
- Realize the embedded control system for single atombot and a central controller on a server for multi-robot system.
- Build a motion capture system to capture the position of multiple robot.
- Build the analytical and NeuralSDE simulation models for system identification.

Neural Signal Control for Bio-mechanical Balancing — Sep. 2023 — Present
Advisor: Jingshuang Li — University of Michigan, Ann Arbor, USA.

- Build a human-balancing model of standing on a log with both torque and muscle control.
- Developed a 3-case controller to understand human behaviour.
- Raised a discrete-output-state LQR/LQG model correspond to simple calculation in spiking neuronal network.

Combustion Studies with Transfer Learning — Sep. 2022 — Oct. 2023
Advisor: Dezhi Zhou — Shanghai Jiao Tong University, Shanghai, China.

- Build artificial neural network and graph neural network model to predict the ignition delay of a certain kind of fuel.
- Explored a transfer learning method aimed at predicting ignition delay for various fuels with different molecular structure.

SELECTED COURSES

Graduate Level Courses

- MATH 658 Nonlinear Dynamics, Geometric Mechanics, and Control (A+)
- ECE 598 Convex Optimization Methods in Control (A+)
- EECS 598/498 Control Theory for Biological Sensori-motor System (A)
- IOE 618 Stochastic Optimization (A)
- MATH 526 Discrete Stochastic Processes (A+)

Undergraduate Level Courses

- MATH 471 Introduction to Numerical Methods (A+)
- MATH 445 Introduction to Information Theory (A+)
- EECS 442 Computer Vision (A)
- STATS 413 Applied Regression (A)
- MATH 451 Advanced Calculus (A)
- PSYCH 3620 Research Methods in Psychology (A)
- PHYSICS 160/260/360 Honors Physics I/II/III (A)

SEMINAR PRESENTATION

Flipping Tennis Racket: Intermediate-axes Stability of Rigid Body and Control Aug. 2024
Advisor: Joe (Zhengyuan) Huang University of Michigan, Ann Arbor, USA

- This is the presentation of Directed Reading Program (from May. 2024 to Aug. 2024) by the mathematics department, University of Michigan. The advisor, Joe, is a PhD student advised by Professor Anthony Bloch.
- Read the book *Differential Equations, Dynamical Systems, and an Introduction to Chaos*.

TEACHING EXPERIENCE

Grader for MATH 471 (Introduction to Numerical Methods) Umich, Ann Arbor, USA. Jul. 2024 — Aug. 2024

- Worked with Professor Andrei Prokhorov as a grader of an advanced undergraduate mathematics course. The course covers numerical methods for linear algebra, differential equations and dynamical systems.

Teaching Assistant for ECE 2300 (Electromagnetics I) SJTU, Shanghai, China. May. 2024 — Aug. 2024

- Worked with Professor Nana Liu as a course assistant of a 100+ student compulsory course for ECE major. The course covers vector's analysis, static fields, time-varying fields, and plane wave. Hold recitation classes and office hours weekly.

Teaching Assistant for MATH 2860 (Honor Mathematics IV) SJTU, Shanghai, China. Sep. 2023 — Dec. 2023

- Worked with Professor Horst Hohberger as a course assistant of a 150+ student course covering Differential Equations and Linear Algebra. Hold recitation classes and office hours weekly.

Teaching Assistant for MATH 2850 (Honor Mathematics III) SJTU, Shanghai, China. May. 2023 — Aug. 2023

- Worked with Professor Horst Hohberger as a course assistant of a 150+ student course covering Linear algebra and Multivariable calculus. Hold recitation classes and office hours weekly.

HONORS & AWARDS

Roger King Scholarship Ann Arbor, USA. Aug. 2024
Summer Undergraduate Research in Engineering (SURE) Stipend Ann Arbor, USA. Mar. 2024
Dean's Honor List, FA2024, WN2023, FA2023 Ann Arbor, USA. Dec. 2024, Jun. 2024, Dec. 2023
UM-SJTU Joint Institte Student Development Scholarship Shanghai, China. Apr. 2023
Silver Medal in The University Physics Competition Shanghai, China. Dec. 2022
SJTU Undergraduate Excellent Scholarship Shanghai, China. Oct. 2022
Second Prize in the Chinese National Physics Contest for Middle School Students Shanghai, China. Oct. 2019

SKILLS

- **Programming:** Python, MATLAB, C/C++, R, Mathematica, Verilog, Elm, LaTeX.
- **Robotics:** PCB Design (EasyEDA), 3D Printing (Autodesk Fusion 360), Combustion Computation (Cantera).