William (Weiyu) CHEN

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Research Interest

My research interests includes **control theory**, **optimization theory**, **robotics**, **machine learning**, **options pricing**, and **IV-based trading strategies**.

Education

University of Maryland (UMD) **College Park, MD, USA**
Ph.D. in Bioengineering Jan. 2024 - present

- Expected graduation: 2026
- Bioimaging and Machine Vision (BMV) Lab, Advisor: Dr. Yang Tao

University of Maryland (UMD) **College Park, MD, USA**
M.S. in Electrical and Computer Engineering Aug. 2021 - Dec. 2023

- Thesis: Multifunctional Path Planning Algorithm and Model for Optimal, Smart, Sustainable Oyster Harvesting
- Bioimaging and Machine Vision (BMV) Lab, Advisor: Dr. Yang Tao

National Taiwan University (NTU) **Taipei, Taiwan**
B.S. in Engineering Science and Ocean Engineering Sep. 2018 - Jun. 2021

- Graduated 1 year early
- Advance Fluid Power Control Lab (AFPCL), Advisor: Dr.-Ing. Mao-Hsiung Chiang

Research Experience

Graduate Research Assistant (GA II), *Advisor: Dr. Yang Tao* Jun. 2022 - present
Bioimaging and Machine Vision Lab (BMV Lab), UMD UMD, USA

- Researched nonlinear differential equation based kinodynamic model for fishing boats
- Developing novel control systems for fishing boats for precision aquaculture
- Developing path planning and optimization algorithms for oyster harvesting
- Research supported by USDA NIFA SAS grant: #20206801231805

Graduate Researcher, *Advisor: Dr. Yiannis Aloimonos* Dec. 2021 - May. 2022
Perception and Robotics Group (PRG), UMD UMD, USA

- Researched underwater image dehazing with deep learning
- Researched vision-based underwater SLAM
- Implementation of DVL and Bluerov 2 hardware
- Research supported by USDA NIFA SAS grant: #20206801231805

Undergraduate Researcher, *Advisor: Dr. -Ing. Mao-Hsiung Chiang* Aug. 2020 - Jun. 2021
Advance Fluid Power Control Lab (AFPCL), NTU NTU, TW

- Researched Indoor SLAM algorithms and applications

Selected Course Projects

CMSC828L - Advance Topics in Deep Learning, *Lecturer: Dr. David Jacobs* UMD, USA
Project title: "Underwater SLAM"

- Derived differential equations and proofs for SLAM
- Compared the performance of traditional extended Kalman filter (EKF) and particle filter to deep learning techniques for underwater dehazing

ESOE2013 - Object Oriented Programming NTU, TW
Project title: "Stock Crawling App"

- Crawled delayed and historical data from both Taiwan stock exchange and Bloomberg using Java.
- Implemented a watchlist function, price alerts, and general trading advice for both Taiwan and US stocks

Publication

Chiao-Yi Wang, Guru Nandhan Appiya Dilipkumar Peethambari, Yi-Ting Shen, **Wei-Yu Chen**, Sandip Sharan Senthil Kumar, Alexander Long, "ShellCollect: A Framework for Smart Precision Shellfish Harvesting Using Data Collection Path Planning," in IEEE Access, vol. 12, pp. 177829-177843, 2024, doi: 10.1109/ACCESS.2024.3505849. 2024.

WeiYu Chen, ChiaoYi Wang, Kaustubh Joshi, Yi-Hsuan Chen, Sandip Sharan Senthil Kumar, Alan Williams, Anjana Hevaganinge, Xiaomin Lin, Allen Pattillo, Miao Yu, Nikhil Chopra, and Yang Tao. "A Novel Kinodynamic Model for Dubins-Based Motion Primitives in Precision Oyster Aquaculture" (Under review Frontiers in Robotics and AI). 2025.

Anjana Hevaganinge,Joshua Ehizibolo, Ravidu Hevaganinge, Jenny Yarmovsky, Jibreel Waheed, **Wei-Yu Chen**, Benjamin Wu, Julian Cooper, Ryan Mahon, Mohamed Ali, Dongyi Wang, Yang Tao, "Natural Transfer of Fine Motor Human Skills to Robot" (Under review Science Robotics).. 2025.

Awards & Honors

6th place, Virtual RobotX May 2019 - Nov 2019

- Controlled a virtual robot based on prototype given by RobotX, competed with team Tang. Directed by Dr. Chi-Fang Chen
- Created an object detection algorithm from lidar point cloud on ROS Melodic before constructing the whole system with the entire team

Teachings

Teaching Assistant in ENEB408B Jan. 2023 - May. 2023
Department of Electrical and Computer Engineering UMD

- Course name: **Capstone Design Lab**
- Taught lab sessions and assist the capstone project of 4th year undergraduate students
- Created teaching material and tutorials for Altera DE1SoC, DE2SoC, DE10nano FPGA boards

Teaching Assistant in ENEB455 Jan. 2023 - May. 2023
Department of Electrical and Computer Engineering UMD

- Course name: **Advanced FPGA System Design using Verilog for Embedded Systems**
- Taught lab sessions, hold office hours, grade assignments and exams for 4th year undergraduate students
- Created teaching material and tutorials for Xilinx BASYS 3 FPGA board

Teaching Assistant in ENEB344 Sep. 2022 – Dec 2022
Department of Electrical and Computer Engineering UMD

- Course name: **Digital Logic Design for Embedded Systems**
- Taught lab sessions, hold office hours, grade assignments and exams for 3rd year undergraduate students
- Created teaching material and tutorials for Digital Discovery and Xilinx BASYS 3 FPGA board

CodingBar Teaching Assistant and Lecturer Oct. 2018 – Jun. 2019
AIRABBI Inc. Taipei, Taiwan

- Taught students ranging from 5th grade to high school Python
- Drafted a course syllabus, wrote instructional plans, prepared lecture notes, and recorded full online lectures for BBC Microbit course

Technical Skills

Programming Languages	MATLAB, C, Embedded C, C++, Java, SQL, Verilog, Python, LaTeX
Engineering Tools	AutoCAD, Solidworks, Rhino3D, Linux, ROS, Quartus, Vivado
Languages	Mandarin (native), English (Fluent)

- IELTS academic: 7.5 (Reading: 8.5 | Listening: 8.5 | Speaking: 6.5 | Writing: 7)
- GRE: 324 (Verbal: 155 | Quantitative: 169 | AWA: 4.0)

Talks, Workshops

Talks

- Multifunctional Path Planning Algorithm and Model for Optimal, Smart, Sustainable Oyster Harvesting, Apr. 2024. University of Maryland, Biomedical Engineering Society Mid-Atlantic Research Day, College Park, MD

References

Yang Tao
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University of Maryland
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