YI-HSUAN CHEN

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Research Interest

Dynamics and Control, Motion Planning, Autonomous system, Flight Mechanics

Education

University of Maryland (UMD) **College Park, USA**
Ph.D. in Aerospace Engineering Aug. 2022 - current
- Expected graduation: 2027
- Motion and Teaming (Mo-T) Lab, Advisor: Dr. Michael Otte

King Abdullah University of Science and Technology (KAUST) **Thuwal, Saudi Arabia**
M.S. in Mechanical Engineering Aug. 2020 - May 2022
- GPA : **3.81/4.00**
- Robotics, Intelligent Systems, and Control (RISC) lab, Advisor: Dr. Eric Feron

National Cheng Kung University (NCKU) **Tainan, Taiwan**
B.S. in Aeronautics and Astronautics Sep. 2015 - Jun 2019
- GPA : **4.07/4.3**, graduate ranking: **2/66**
- Intelligent Embedded Control (IEC) Lab, Advisor: Dr. Chao-Chung Peng

Research Experience

Graduate Research Assistant, *Advisor: Dr. Michael Otte* Aug. 2022 – PRESENT
Motion and Teaming Laboratory (Mo-T Lab), UMD UMD, USA
- Researching on funnel-based planning for multi-agent systems.

Master Thesis Research, *Advisor: Dr. Eric Feron* Aug. 2020 – May 2022
Robotics, Intelligent Systems, and Control (RISC) lab KAUST, SA
- Designed a triple-integral control framework to counteract the unknown aerodynamic drag that will be increasing quadratically with time during zero-gravity flight. [Project link][Youtube link]
- Built a flight simulator to verify the proposed control strategy and visualized it in FlightGear.
- Published in AIAA SciTech 2023.

Undergraduate Researcher, *Advisor: Dr. Chao-Chung Peng* Jan. 2018 – Dec. 2019
Intelligent Embedded Control (IEC) Lab NCKU, TW
- Applied reconfiguration technique combined with sacrificing yaw control to recover flight control in the presence of single motor failure. [Project link] [Youtube link]
- Applied Lagrangian mechanics on deriving the mathematical model of a quadrotor, and designed a PID controller using feedback linearization.
- Collaborated with Information and Communications Research Laboratories of Industrial Technology Research Institute (ITRI).

Selected Course Projects

UMD ENAE646 - Advanced Dynamics, *Lecturer: Dr. Derek Paley*
Project title: "Torque-Free Motion of a Rigid Body." [Project link][Youtube link]
- Analyze the motion of a torque-free rigid body and determine its trajectory in the inertial frame.

KAUST EE376 - Dynamic Programming and Optimal Control, *Lecturer: Dr. Meriem Taous Laleg*
Project title: "NMPC for Quadrotor trajectory tracking with constrained inputs." [Project link] [Youtube link]
- Developed a nonlinear model predictive controller to realize trajectory tracking with constrained inputs.

Publication

Chen, Yi-Hsuan, and Eric Feron. "Design of Longitudinal Control for Reduced-Gravity Atmospheric Flights." In *AIAA SCITECH 2023 Forum*. 2023.

Lien, Yu-Hsuan, Chao-Chung Peng, and **Yi-Hsuan Chen**. 2020. "Adaptive Observer-Based Fault Detection and Fault-Tolerant Control of Quadrotors under Rotor Failure Conditions." In *Applied Sciences*. 10, no. 10: 3503.

Awards & Honors

Gustave J. Hokenson Fellowship 2023
- Awarded by the UMD Aerospace Engineering Department

Honorary Member of Phi Tau Phi Scholastic Honor Society 2019
- The highest honor given to the top 1% of graduates in university, based on excellent academic achievements as well as moral conduct

Professor Li Ke-Rang Scholarship 2018
- For university students who are the top five students in their department

Academic Achievement Award*3 (Top 10% in class each academic year) 2015 – 2019
- Received every academic year

Distinguished Physics Contest Award (Top 10% of all candidates) 2016

Teachings

Teaching Assistant on ENAE432 Control of Aerospace Systems Jan. 2023 - May. 2023
Department of Aerospace Engineering UMD
- Lead weekly discussion sessions by giving 50-minute review lectures.
- Provide consultation during regular TA hours and graded assignments and exams.

Teaching Assistant on Engineering Mathematics Sep. 2019 - Jun. 2020
Department of Aeronautics and Astronautics NCKU
- Provide consultation during regular TA hours and graded assignments and exams.

After-School Part-time Tutor Opt. 2018 – June 2019
National Tainan Chia-Chi Senior High School Tainan, Taiwan
- Offer after-school consultation in Mathematics and Physics for high school students

Technical Skills

Programming Languages MATLAB, C++, Python, LabVIEW, LaTeX

Engineering Tools AutoCAD, CATIA, Linux, ROS, PSoC Creater

Languages Mandarin (native), English (advanced), Taiwanese (fluent)
- TOEFL iBT: 104 (Reading: 29 | Listening: 27 | Speaking: 22 | Writing: 25)
- GRE: 324 (Verbal: 157 | Quantitative: 167 | AWA: 3.0)

Volunteer Experience

Taiwan-United States Alliance (TUSA) Global Ambassador Scholarship Program 2019
- Volunteered as a Language Exchange Partner to improve English speaking skills
- Assisted international students in settling into life in Tainan

References

Michael Otte
Assistant Professor, Department of Aerospace Engineering
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University of Maryland
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Eric Feron
Professor, Program in Electrical and Computer Engineering
Affiliated with Mechanical Engineering and Bioengineering
King Abdullah University of Science and Technology
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