CHENG-HAN YU

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HIGHLIGHTS

- Four years of experience in Formula Student as team leader. Leader of suspension and suspension engineer at NTHU Racing, with expertise in leadership, vehicle dynamics, and mechanical design.
- Excelled in securing partnerships with over 100 worldwide companies for NTHU Racing, demonstrating exceptional communication and project management skills. Spearheaded team to overall win in Formula Student Taiwan 2024.
- Competed in Formula Student Germany 2022/2023, Formula Student Alpe Adria 2022, and Formula Student Czech Republic 2023 (with 2nd-place finish in driverless skidpad).

SKILLS

Mechanical design | Vehicle dynamics | Robotics engineering | Vibration analysis | Digital control | Ansys | SolidWorks | AutoCAD | Inventor | ADAMS | COMSOL | MATLAB | ROS | C/C++

EDUCATION

National Tsing Hua University (NTHU) **Hsinchu, Taiwan**
Bachelor of Science in Power Mechanical Engineering **June 2024**

PRACTICAL EXPERIENCE

***Team Leader* | NTHU Racing** **Sep. 2023–Aug. 2024**

- Directed and supervised team of over 80 people engaged in Taiwan first ever carbon fiber wheel rim, carbon fiber monocoque, vehicle dynamics, and driverless system development.
- Cultivated strong relationships with over 100 local and international companies, securing financial and technical support and contributing to successful technical development. the number of sponsors increased by 12%, while the fundraising amount grew by nearly 20%.
- Collaborated with department leaders to streamline workflows and improve interdepartmental coordination, leading to overall win in Formula Student Taiwan 2024.

***Leader of Suspension* / *Suspension Engineer* | NTHU Racing** **Sep. 2020–Aug. 2023**

- Improved vehicle performance by 10% with torque vectoring system on AWD EV racecar.
- Reduced suspension system weight by 20% using CAD and FEA to develop lightweight, high-performance double wishbone suspension integrated with anti-roll bar system, optimizing strength-to-weight ratio.
- Collaborated closely with drivers to gather feedback on grip performance and vehicle balance. Fine-tuned suspension setups for optimal race performance, leading to P4 in manual acceleration and P5 in manual skidpad collectively at FSCzech 2023.
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PUBLICATIONS

Cheng-Han Yu, Zhi-Qiang Lee, Meng-Hsuan Tien, and Ming-Huang Li, “Nonlinearity Modification of CMOS-MEMS Resonators with Stress Concentration Structures”, International Conference on Smart Sensors, Hsinchu, Taiwan, July 1-3, 2024

PROJECT EXPERIENCE

First place, Robotics Final Project Competition - Tower of Hanoi, for *Robotics*, NTHU **June 2024**

- Implemented advanced path planning (including obstacle avoidance) algorithms to ensure smooth, collision-free movements of robotic arm while solving Tower of Hanoi puzzle.
- Conducted extensive simulations and testing to refine robotic system, fine-tuning both movement accuracy and obstacle avoidance capabilities.

Motor Digital Controller Design for *Digital Control*, NTHU **Dec. 2023**

- Identified motor transfer function and performed Bode plot analysis in discrete domain for controller design.
- Developed digital controller using C, implemented microcontroller for motor position control, and optimized performance through PID control.

Self-Made Motors and PID Controller Design for *Control System II*, NTHU **June 2023**

- Custom-built permanent magnet DC motor with self-wiring and integrated sensor system.
- Implemented motor speed control using push-pull amplifier within feedback loop, meeting performance requirements through PID control.

TEACHING EXPERIENCE

***Teaching Assistant* | Mechanical Vibration**

Power Mechanical Engineering, NTHU **Feb. 2024–June 2024**

- Provided tutoring to students on race car suspension analysis, focusing on optimization of suspension system dynamics.
- Guided students in usage of Simulink to simulate race car suspension setups and perform optimization of suspension parameters for enhanced performance.

***Teaching Assistant* | Formula Student Racing Car Design and Manufacture Project**

Power Mechanical Engineering, NTHU **Sep. 2023–Jan. 2024**

- Organized weekly group meetings among 8 subgroups, ensuring effective communication and collaboration.
- Provided quarterly reports to professor, detailing project progress and challenges.
- Managed overall project coordination and system integration, overseeing alignment of all subgroups.