Y. Deemo Chen

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EDUCATION

Cornell University, College of Engineering, Ithaca, NY **Expected May 2024**
Bachelor of Engineering, Electrical and Computer Engineering, Computer Science Minor
GPA: 3.978, *Tau Beta Pi*

Selected Coursework: Digital Signal Processing (DSP) • Foundation of Robotics • Robot Learning • Robot Perception • Advanced Microcontroller Design • Evolutionary Algorithms

SKILLS

Technical: C/C++, Python (NumPy, Matplotlib, PyTorch), MATLAB/SIMULINK, KiCAD (EDA), OnShape (MCAD)
Professional: Embedded Systems (ARM), Signal Processing (Filtering & Estimation), Control Systems

RESEARCH EXPERIENCE

Alpha Mission, Cornell Space System Design Studio, *ACS Engineer* **June 2022 – Present**

- Working on a 1U CubeSat projected to be launched in 2024, advised by Prof. Mason Peck. Developed the Attitude Control System (ACS) in SIMULINK, deployed with C++, designed Extended Kalman Filters (EKF) and moving kernel filters for attitude determination and denoising, analyzed noise characteristics, optimized parameters using Monte Carlo methods, and debugged issues with sensing, actuation, and controller timing. Integrating the attitude control algorithms into the overall flight software, with hardware-in-the-loop verification.

Cornell SmallSat Mission Design School, *TT&C Lead* **June 2023 – July 2023**

- Served as the Telemetry, Tracking, and Command (TT&C) Lead for the STARLITE mission.
- Collaborated with engineers and scientists on the TT&C subsystem development for a small satellite mission following the NASA Pioneer program standard, devised effective methods for long-range communication and tracking.
- Contributed to a paper to the SPIE Conference.

WCSL, UCSB**,** *Undergraduate Researcher* **May 2020 – Sept. 2020**

- Worked on Adversarial Machine Learning studies at the Wireless Communication and Sensornets Laboratory (WCSL) with Prof. Upamanyu Madhow; experimented with different adversarial machine learning attacks in modern Computer Vision studies and learned the most effective ways to protect the model.

WORK EXPERIENCE

Cornell Motion Studio, *Drone Researcher* **Sept. 2023 – Present**

- Creating a quadcopter for the Cornell Motion Studio to be used in various classes, advised by Prof. Brian Kirby.
- Developed the flight controller hardware around a Raspberry Pi Pico (ARM M0), designed schematics for power regulator, IMU, ESC, and the radio receiver. Manufactured the corresponding PCBs.
- Designed the flight controller software, including the low-level IMU, Motor, Radio libraries, the state estimation filter systems, and the PID controller.

Cornell University, *Teaching Assistant* **Jan. 2022 – June 2022**

- TA for ECE 2720: Data Science for Engineers.
- Held weekly Office Hours, graded/designed assignments, and answered questions.

PROJECT EXPERIENCE

PicoBoi – Handheld Game Device with GPS **Nov. 2022 – Dec. 2022**

- Developed a Gameboy-like device with a multithreaded system, in which the user can play games with music, track their location on a map, and receive accurate local time from the satellite. A custom library was created for the GPS module. Designed and manufactured the PCB. Published the project on Circuit Cellar.

TidyPlotter – Robust Image Sketcher **April 2023 – May 2023**

- Developed a SCARA robot that can process images with OpenCV to generate contour graph and plot it.
- Designed and fabricated 3D-printed arms with step-motors using inverse-kinematics to draw the image sketch.

AWARDS

2024 CRA Award for Outstanding Undergraduate Researchers **Oct. 2023**
Kaggle SIIM-ISIC Melanoma Classification (Computer Vision) **Silver Medal**
Kaggle Prostate cANcer graDe Assessment (PANDA) Challenge (Computer Vision) **Bronze Medal**

PUBLICATIONS

-**"A SmallSat mission study for STARLITE: Superluminous Tomographic Atmospheric Reconstruction with Laser-beacons for Imaging Terrestrial Exoplanets,"** *SPIE Space Telescopes and Instrumentation 2024: Optical, Infrared, and Millimeter Wave* conference, Yokohama **June 2024**

-**"Modern Take on a Classic Handheld Gaming Device,"** *Circuit Cellar,* Issue #401, pg. 12-18. **Dec. 2023**

-Attitude Control System Paper to the *Journal of Guidance, Control, and Dynamics* **In-Progress**

-Attitude Control System Paper to the *Small Satellite* Conference **In-Progress**