Y. Deemo Chen

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Education

California Institute of Technology, Computing+Mathematical Sciences, Ph.D. 2025 – Present

- Advisor: Prof. Soon-Jo Chung

California Institute of Technology, Electrical Engineering, M.S. 2024 – 2026

- GPA: 4.0/4.0 | Advisor: Prof. Soon-Jo Chung

Cornell University, Electrical and Computer Engineering, B.S. 2020 – 2024

- GPA: 3.97/4.0 | Magna Cum Laude | Advisor: Prof. Mason Peck

Publications

(Indicates Equal Authorship):*

- **Y. D. Chen***, A. Zimmermann*, T. A. Berrueta, S. J. Chung, "Environment-aware learning of smooth GNSS covariance dynamics for autonomous racing." *IEEE International Conference on Robotics and Automation (ICRA)* (2026). arXiv:2602.21366
- J. Umansky-Castro, J. Ma, D. McDonald, D. Hackett, Z. Garcia, L. Greenhill, E. Zhang, C. Goddard, **Y. D. Chen**, M. Hurford, A. Hanwadikar, G. Tang, G. Lowry, M. Peck, "Successful deployment of the first free-flying light sail: Results from the Cornell University Alpha CubeSat mission." *40th Annual AIAA/USU Conference on Small Satellites (SmallSat)*, Paper SSC26-RAII-06 (2026).
- J. Umansky-Castro, **D. Chen**, O. Deshmukh, H. Gong, N. Natsoulas, M. Peck, A. Filo, A. Burke, "COTS implementation of magnetorquer-only CubeSat spin stabilization." *39th Annual AIAA/USU Conference on Small Satellites (SmallSat)*, Paper SSC25-P1-24 (2025).
- A. B. Johnson, A. Padres, R. Hughes, C. Buonagura, Z. Chapman, A. Kubas, V. Hegelein, I. Mishra, A. Smith, A. T. M. Tahsin, A. Parashar, R. Bendimerad, **D. Chen**, Q. Lu, A. A. Kounios, D. Desilva, V. Padres, J. Lloyd, D. Savransky, J. Umansky-Castro, A. van Paridon, E. Petro, "A SmallSat mission study for STARLITE: Superluminous tomographic atmospheric reconstruction with laser-beacons for imaging terrestrial exoplanets." *SPIE Space Telescopes and Instrumentation: Optical, Infrared, and Millimeter Wave* (2024). doi:10.1117/12.3018042

Research Experience

Graduate Research Assistant, Prof. Soon-Jo Chung, Caltech 2024 – Present

- Developing learning-based methods for highly dynamic robotic systems to adapt to changing environments in real time on hardware. Currently working on predicting distribution dynamics of uncertainty and trajectories of autonomous racecars.

Undergraduate Researcher, Prof. Mason Peck, Cornell University 2022 – 2024

- Led the Attitude Control and Determination System (ACDS) subteam for Alpha CubeSat, launched by NASA and deployed in 2025, carrying the world's first retro-reflective, free-flying light sail. Developed filter systems (EKF, band-pass), optimized controller parameters using Monte Carlo methods. Integrated the attitude control algorithms into the overall flight software, with hardware-in-the-loop verification of sensing, actuation and timing.
- Served as Telemetry, Tracking, and Command (TT&C) lead in the Cornell SmallSat Mission Design School (SMDS) for the STARLITE mission study.

Undergraduate Researcher, Prof. Upamanyu Madhow, UCSB 2020

- Analyzed different adversarial machine learning attacks in modern computer vision systems and developed effective ways to protect models.

Projects

Indy Autonomous Challenge (IAC), Caltech 2024 – Present

- Developing learning-based opponent trajectory distribution prediction methods by utilizing large-scale player behavioral data and flow matching models, with robust, high-performance integration into the hardware stack.
- Led the localization subteam for the Caltech Racer team, designed robust multi-sensor (GNSS, IMU, LiDAR, wheel) fusion methods in high-speed, signal-distorted, and time-critical environments.

Custom Quadcopter Platform, Cornell University 2023 – 2024

- Developed fully custom quadcopters used as teaching platforms in Cornell engineering courses, supported by Cornell Motion Studio.
- Designed the flight computer PCB around a Raspberry Pi Pico with power regulation, IMU, brushless motor controllers, and radio receiver; wrote the flight software, including low-level IMU, motor, and radio drivers, an EKF state estimator, and a PID controller.

Awards & Honors

Barbara F. and Lawrence R. White Fellowship, Caltech 2024 – 2026

CRA Award for Outstanding Undergraduate Researchers 2024

Tau Beta Pi, Engineering Honor Society 2023 – Present

Kaggle SIIM-ISIC Melanoma Classification – *Silver Medal* 2020

Kaggle Prostate cANcer graDe Assessment (PANDA) Challenge – *Bronze Medal* 2020

Teaching

CDS 245: Data-driven Control, Teaching Assistant, Caltech 2024

ECE 2720: Data Science for Engineers, Teaching Assistant, Cornell University 2022

Service

Reviewer:

- *IEEE International Conference on Robotics and Automation (ICRA)*
- *IEEE Robotics and Automation Letters (RA-L)*