ERICH LIANG
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EDUCATION

Princeton — Princeton, NJ
Ph.D. in Computer Science — *August 2023 - Present*
Advisor: Prof. Jia Deng — *Expected Graduation: May 2028*

California Institute of Technology — Pasadena, CA
B.S., Computer Science and Mathematics — *September 2017 - March 2021*
Double Major; GPA 4.1 — *(graduated early)*

HONORS AND AWARDS

First Year Fellowship in Natural Sciences and Engineering	*August 2023*
BAIR Research Ignition Award, UC Berkeley	*August 2021*
NSF Graduate Fellowship Winner	*March 2021*
Doris S. Perpall SURF Speaking Competition Finalist (Top 6)	*November 2020*
Manit M. Limlamai SURF Fellowship ($3000 awarded)	*Summer 2020*
Caltech Meeting of the Minds Best Research Poster Presentation Award	*May 2019*
TreeHacks: Juntos, winner of Best Deep Learning Hack, MLH Finalist	*February 2019*
Hacktech: GunShield, winner of Best IoT Hack, Best Hardware Hack, Best ML Hack	*March 2018*
LA Hacks: Crowdchain, winner of "Make Something People Want" Grant ($6000)	*March 2018*
USA Math Olympiad Qualifier; USA Junior Math Olympiad Qualifier	*2013-2015*
USACO Computer Programming Online Competition, Platinum Level	*2015-2017*

SELECT PUBLICATIONS AND PRESENTATIONS

Handling Hidden Holes in View-Based 3D Scene Generation — Submitted for review
Erich Liang, Sreemanti Dey*, Jia Deng* — November 2025

InFlux: A Benchmark for Self-Calibration of Dynamic Intrinsics of Video Cameras — NeurIPS 2025
Erich Liang, Roma Bhattacharjee, Sreemanti Dey*, Rafael Moschopoulos, Caitlin Wang, Michel Liao, Grace Tan, Andrew Wang, Karhan Kayan, Stamatis Alexandropoulos, Jia Deng* — *September 2025*

Princeton365: A Diverse Dataset with Accurate Camera Pose — ICCV 2025
Karhan Kayan, Stamatis Alexandropoulos, Rishabh Jain, Yiming Zuo, Erich Liang, Jia Deng — *June 2025*

R6D-MU: A Benchmark for Relative 6D Pose Estimation of Multiple Unknown Objects — Submitted for review
Beining Han, Siyang Wu, Lingjie Mei, Jack A Defay, Derek Geng, Yiming Zuo, Erich Liang, Alexander Raistrick, Lahav Lipson, Jia Deng — *November 2024*

LayeredFlow: A Real-World Benchmark for Non-Lambertian Multi-Layer Optical Flow — ECCV 2024
Hongyu Wen, Erich Liang, Jia Deng — *September 2024*

Radar Fields: Frequency-Space Neural Scene Representations for FMCW Radar — SIGGAPH 2024, *January 2024*
David Borts, Erich Liang, Jipeng Sun, Tim Broedermann, David Brueggemann, Christos Sakaridis, Luc Van Gool, Andrea Ramazzina, Edoardo Palladin, Stefanie Walz, Mario Bijelic, Felix Heide

HR-NeuS: Recovering High-Frequency Surface Geometry via Neural Implicit Surfaces — Arxiv Preprint, *February 2023*
Erich Liang, Kenan Deng, Xi Zhang, Chun-Kai Wang

Pie and AI: Juntos — Online due to COVID, *May 2021*
Invited talk at Deeplearning.ai and Nova77 Stem Workshop
Alex Cui, Erich Liang* (equal contribution)*

NuiVend - Next Generation Vending Machine — CSCI 2016, *December 2016*
Robert Gruen, Erich Liang* (equal contribution)*

RESEARCH EXPERIENCE

Princeton Vision and Learning Lab — Princeton, NJ
Ph.D. Student — *August 2023 – Present*
Advisor: Prof. Jia Deng
Working on a variety of 3D reconstruction problems in the areas of MVS and SLAM, predicting camera intrinsics, and occlusion reasoning for generative 3D models. Accurate 3D geometry reconstruction from 2D images is challenging, and learning strong 3D geometry priors from data is crucial for achieving success. Working on using concepts such as optical flow, epipolar geometry, bundle adjustment, and realistic camera models to improve accuracy of robustness of 3D algorithms.

Amazon Imaging Sciences — New York, NY
Applied Scientist Intern — *May 2023 – August 2023*
Advisor: Thomas Kahn, Frederic Devernay
We worked on improving the robustness of NeRF renders in the presence of heavy defocus blur, which is common in most casual video capture settings. Taking inspiration from optics, we computed the silhouette of light rays that can affect a given pixel and incorporated relevant parameters such as entrance pupil and focus distance into the ZipNeRF volumetric rendering formulation. By jointly optimizing for NeRF and defocus blur parameters, our model infers proper defocus blur parameters and can synthetically re-render the scene under different focus settings.

Video and Image Processing Lab — Berkeley, CA
Research Assistant — *January 2023 – May 2023*
Advisor: Prof. Avideh Zakhor
We worked on problems in the general area of vision-based robotic navigation and path planning, with a focus on using reinforcement learning to create a robust autonomous path planning algorithm to deploy on real life drones. Many existing path planning algorithms are 2D in nature, meaning that they struggle to find paths that involve sharp changes in elevation. Other directions we explored include task-oriented path planning, memory-enabled path planning agents, and creating a specialized pipeline for flying a drone autonomously for high quality NeRF capture and 3D reconstruction.

Amazon A9 MARS Group — Palo Alto, CA
Applied Scientist Intern — *May 2022 – November 2022*
Advisor: Kenan Deng

We worked on NeRF-based approaches for reconstructing 3D surface geometry with high frequency features from 2D images and camera poses. Our method achieves much more fine-detailed surface reconstruction compared to previous SOTA methods, and utilizes a novel surface regularization technique and a coarse-to-fine training schedule to maintain large-scale geometric accuracy of the reconstructed 3D surface.

Berkeley Ng Research Group Berkeley, CA
Research Assistant *July 2021 - January 2023*
Advisor: Prof. Ren Ng
We worked on Oz Vision, a prototype of next-generation color display that utilizes adaptive optics and retinal tracking to precisely deliver laser stimulation to individual cone photoreceptors in a person's retina. Focused on designing a novel eye-tracking algorithm that could produce more accurate tracking with lower latency. Oz Vision could enable humans to see new "impossible colors" that cannot be observed naturally, or enable color-blind people to differentiate between red and green.

Caltech Bouman Research Group Pasadena, CA
Undergraduate Researcher, Manit M. Limlamai SURF Fellow *September 2019 – March 2021*
Advisor: Prof. Katherine L. Bouman
We investigated improving blackhole video reconstruction accuracy by generalizing model priors. Methods used include particle filtering and other Markov Chain Monte Carlo (MCMC) algorithms. Also worked on model-fitting and importance analysis directly on raw EHT data to avoid algorithmic image reconstruction biases.

Caltech Rigorous Systems Research Group Pasadena, CA
Undergraduate Researcher *September 2018 - June 2020*
Advisor: Prof. Adam Wierman
We analyzed Pasadena Unified School District's open enrollment (OE) system and suggested changes based on ML simulation results and mean field theory analysis. Our suggested OE changes improved number of students receiving top choice school by 10%. We then analyzed the socio-economic impacts of the changes via a diversity metric and autogenerated enrollment visualizations.

Caltech Computational Vision Lab Pasadena, CA
Undergraduate Researcher *March 2019 - June 2019*
Advisor: Prof. Pietro Perona
We worked on creating a bandwidth-conserving, hierarchical map search algorithm. We tested reinforcement learning policies on synthetically generated maps of colored MNIST digits.

Microsoft Research Advanced Development Group Redmond, WA
High School Research Intern *June 2016 - August 2016*
Advisor: Robert Gruen
We added natural voice commands, purchase history, and multi-item vending functionality to a 1992 PolyVend machine to create NuiVend. Tasks included reverse engineering vending machine circuitry for shelf control and experimenting with various speech-to-text and text-to-intent methods.

INDUSTRY EXPERIENCE

Scale AI San Francisco, CA
Student Researcher *September 2025 - Present*
Mentor: Madhu Sehwag
Developing experiments to analyze the capability of LLMs to serve as assistants for research scientists working in empirical fields like physics, chemistry and biology. Planning to submit to ICML 2026.

Gatsby Labs Austin, TX
Web Fullstack Intern *March 2021 – June 2021*
Mentor: Zach Rivkin
Utilized technologies such as React, Typescript, MongoDB, and more to enhance and create features that help make event planning a more efficient and manageable task. Worked on researching and designing a notification system for the Gatsby website.

HVF Labs San Francisco, CA
ML and Data Science Intern *August 2019 - October 2019*
Mentor: Reginald Long
Worked at Max Levchin's startup incubator on Resolve, a B2B risk management startup. Performed data analytics on past loan data and created ML models to decide how much to loan to customers.

Facebook Menlo Park, CA
AR/VR Fullstack Intern *June 2019 - August 2019*
Mentor: Rachel Lee
Pioneered engineering work on brining the "Guide" user role to Facebook Horizon. Created back-end logic, API layer, and VR UI button updates for Guide interactions with other users (blocking, muting). Discussed with legal teams and design teams about Guide moderation privacy concerns.

Bloomberg New York, NY
Machine Learning Intern *June 2018 - September 2018*
Mentor: Peter Petrov and Yichen Yang
Developed Skynet, a ML model generation pipeline that preemptively detects anomalous trades. Improved Skynet's accuracy by 35% and cut training time on 15,000+ points to 30 seconds.

Versium Analytics Inc. Redmond, WA
High School Data Science Intern *September 2016 - September 2017*
Mentor: Kevin Marcus
Built AmISafe.com, a website that generated heat maps of criminal activity across the US. Worked on DataFinder, a service that provided clients with lists of personal and business data. Created PHP pipeline for list generation, sped generation time from several days to 2-3 hours.

TEACHING EXPERIENCE

Princeton Senior Thesis / Independent Work Mentor *September 2024 – May 2026*
Mentor
Worked with various undergraduate students on camera intrinsics and transparent object segmentation research projects. I host weekly research meetings to provide feedback and insight on these projects, which will contribute to the students' thesis works.

OURSIP *June 2024 – August 2025*
Mentor
Worked with Princeton first / second year undergraduate students on projects involving SLAM and camera intrinsics. Gave informal lectures and assignments to help establish fundamentals in machine learning and 3D computer vision.

ReMatch+ Summer Program *June 2024 – August 2025*
Mentor

Worked with Princeton first / second year undergraduate students on projects involving SLAM and camera intrinsics. Gave informal lectures and assignments to help establish fundamentals in machine learning and 3D computer vision.

Princeton COS526 Neural Rendering *January 2025 – May 2025*
Teaching Assistant
Served as a TA for Princeton's COS526 course (Neural Rendering), which covered a variety of topics related to NeRF, 3D Gaussian Splatting, GANs, and more. Responsibilities included creating and grading student assignments, giving precepts, and hosting office hours.

Princeton COS324 Introduction to Machine Learning *September 2024 – December 2025*
Head Teaching Assistant
Served as the head TA for Princeton's COS324 course (Introduction to Machine Learning), which has 140+ students enrolled. Responsibilities include coordinating a team of 24+ teaching assistants for grading, running weekly staff meetings, holding office hours, and answering questions from student forums.

Summer STEM Institute (SSI) *December 2020 – August 2021*
Head Instructor, Curriculum Creator
One of the head instructors of the programming bootcamp, a 6-week intensive course designed to help students become familiar with Python, machine learning, and tools used in practice. Hand-picked and processed 200 starter datasets designed for students to quickly get started on analyzing clean data. Designed five research tutorials containing guided case studies utilizing methods such as linear fits, decision trees, KNN, inferential statistics, and more.

Turing Prep *August 2020*
Head Instructor
Designed curriculum plan for an 18-week online USACO course for high school students. Created course content on EdStem to deliver high-quality, online learning during COVID.

Northwest Chinese School, **Eastside Education** *September 2013 - June 2017*
Math Instructor
Taught Math Olympiad to a classroom of 35 elementary school students every Saturday. Managed all aspects of the class, including designing course content, lecturing, and grading homework.

MENTORING

- **David Liu**, Undergraduate Student at Princeton, fall 2025
- **Benjamin Zhou**, Undergraduate Student at Princeton (IW), fall 2025
- **Caleb Kha-Uong**, Undergraduate Student at Princeton, fall 2025
- **William Oh**, Undergraduate Student at Princeton, fall 2025
- **Chinmaya Saran**, Undergraduate Student at Princeton, fall 2025
- **Andrew Wang**, Undergraduate Student at Princeton, spring 2025
- **Roma Bhattacharjee**, Undergraduate Student at Princeton (ST), 2024-2025. She won the Outstanding Computer Science Senior Thesis Prize.
- **Caitlin Wang**, Undergraduate Student at Princeton (IW), 2024-2025
- **Rafael Moschopoulos**, Undergraduate Student at Princeton, 2024-2025
- **Grace Tan**, Undergraduate Student at Princeton, 2024-2025
- **Arnav Sharma**, High School Student, 2024-2025
- **Michel Liao**, Undergraduate Student at Princeton (IW), 2023-2025

- **William Pan**, Undergraduate Student at Princeton (IW), 2023-2024
- **Emily Zhou**, Undergraduate Student at Princeton, 2023-2024
- **Addison Wu**, Undergraduate Student at Princeton, 2023-2024
- **Sumanth Maddirala**, Undergraduate Student at Princeton, 2023-2024
- **Mingxuan Wu**, Visiting Undergraduate Student at UC Berkeley, 2022-2023

RELEVANT COURSEWORK

Courses at UC Berkeley:

- AI: CS280 Computer Vision, CS284 Deep Reinforcement Learning
- Graphics: CS284 Foundations of Computer Graphics, CS294-164 Computational Color, CS294-26 Intro to Computer Vision and Computational Photography

Courses at Caltech:

- Select Graduate level courses: Vision: From Computational Theory to Neuronal Mechanisms, Learning Systems, Machine Learning & Data Mining, Advanced Topics in Machine Learning, Mathematical Optimization, Probability
- Computer Science courses: Algorithms, Operating Systems, Decidability and Tractability, Complexity Theory, Cryptography
- Mathematics courses: Linear Algebra, Abstract Algebra, Classical Analysis, Topology, Differential Equations, Discrete Math, Calculus
- EE and Physics courses: Signal-Processing Systems and Transforms, Quantum Mechanics and Statistical Physics, Classical Mechanics and Electromagnetism

ACTIVITIES AND LEADERSHIP

Caltech Data Science Club *September 2019 – 2021*
Board Chairman
Hosted various speakers and ML workshops for students aspiring to become data scientists. Worked with sponsors such as Citadel to host on-campus data science competitions (COVID-19 initiative).

Caltech-Harvey Mudd Math Competition *September 2019 – 2021*
Organizer, Volunteer
Recruited and coordinated volunteers for proctoring and grading tests. Worked on ensuring quality of competition problems. Oversaw and responded to unexpected delays on the day of competition.

Eastside Science Circle *September 2015 - June 2017*
Founder and President
Created Seattle's first science circle to inspire younger students to explore STEM. Led volunteers to host science summer camps, emphasizing intuitive and kid-friendly expository STEM curriculum.

Seattle Infinity Math Circle *September 2014 - June 2017*
President, Student Leadership Group Member
Led volunteers to teach and inspire Seattle mathletes of all backgrounds. Hosted monthly lectures, mock competitions, and notable guest speakers including Prof. Po-Shen Loh and Prof. Zuming Feng.

SKILLS

Java, Python, C, C#, MatLab, TensorFlow, Keras, Pandas, scikit-learn, React, Typescript, Javascript Docker/Singularity, PHP, Bash, HTML/CSS, MySQL, Unity, GraphQL, MongoDB

Fluent in Mandarin Chinese