

Ray Tsai

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EDUCATION

University of Oxford

M.Sc. in Mathematical Sciences

Oxford, United Kingdom

Sep 2025 – Jun 2026

- **Relevant coursework:** Stochastic Differential Equations, Analytic Number Theory, Theories of Deep Learning, Probability on Graphs and Lattices

University of California San Diego

B.Sc. in Mathematics-Computer Science (Honors with High Distinction), GPA: 3.93/4.0

La Jolla, CA

Sep 2021 – Jun 2025

- **Honors Thesis:** *Double Turán Problems*, advised by Prof. Jacques Verstraete
- **Selected coursework:** Extremal Combinatorics and Graph Theory (Honors), Algebraic Combinatorics (Graduate), Discrete Geometry (Graduate), Statistical Learning (Graduate), Complex Analysis (Graduate)

AWARDS

Physical Sciences Dean's Undergraduate Award for Excellence

UC San Diego, 2025

RESEARCH EXPERIENCE

UC San Diego, Department of Mathematics

Undergraduate Research Assistant

La Jolla, CA

Mar 2023 – Jun 2025

- Studied extremal graph theory under Prof. Jacques Verstraete; authored paper *Double Turán Problems*; manuscript in preparation for journal submission.

UC San Diego, Department of CSE

Undergraduate Research Assistant

La Jolla, CA

Apr 2024 – Jun 2025

- Explored connections between algorithmic fairness, computational complexity, and learning theory under Prof. Russell Impagliazzo.

WORK EXPERIENCE

MSI

Software Engineer

New Taipei City, Taiwan

Jul 2023 – Aug 2023, Full-time

- Developed Windows application for local AI image generation with 5-member team; fine-tuned Stable Diffusion model to generate photorealistic MSI laptop images for marketing materials.
- Engineered automated installation pipeline for optimization backends, improving image generation throughput by 80%.

Kook

Co-founder & Lead Software Engineer

San Diego, CA

Dec 2021 – Dec 2022, Start-up

- Co-founded hardware-software startup for automated surfboard rental stations; secured UCSD Basement incubation and led 5-member engineering team through product development lifecycle.
- Architected full-stack React Native application with NFC-based authentication for 100+ beta users, reducing rental initiation time by 75%.

TEACHING EXPERIENCE

Instructional Assistant

UC San Diego, Department of CSE

La Jolla, CA

Jan 2025 – Mar 2025

- Supported Design & Analysis of Algorithms (CSE 101) with 200+ students; conducted weekly office hours and graded assignments on algorithmic concepts including dynamic programming, graph algorithms, and NP-completeness.

TECHNICAL SKILLS

Languages: Python, C/C++, Java, TypeScript, LaTeX **Frameworks:** PyTorch, React Native, Stable Diffusion, Flask, SageMath