

Ray Tsai

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EDUCATION

University of Oxford

M.Sc. in Mathematical Sciences

Oxford, United Kingdom

Sep 2025 – Jun 2026

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

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

- “For demonstrated academic excellence and promise as researchers in UC San Diego’s three areas of study: Chemistry and Biochemistry, Mathematics, and Physics.” (\$1000)

RESEARCH EXPERIENCE

UC San Diego, Department of Mathematics

Undergraduate Research Assistant

La Jolla, CA

Mar 2023 – Jun 2025

- Studied various problems and related literature in extremal graph theory under Prof. Jacques Verstraete
- Conducted a research project on the *Double Turán Problems*; Wrote an honors thesis on the topic.

UC San Diego, Department of CSE

Undergraduate Research Assistant

La Jolla, CA

Apr 2024 – Jun 2025

- Worked through graduate-level complexity theory textbook directly under Prof. Russell Impagliazzo.
- Joined Professor Impagliazzo’s research group on smooth boosting; studied the connections between algorithmic fairness, computational complexity, and learning theory.

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.

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%.

TECHNICAL SKILLS

Languages: Python, C/C++, Java, TypeScript, LaTeX

Frameworks: PyTorch, React Native, Flask, SageMath