

# 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 Highest Distinction), GPA: 3.93/4.0*

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.
- Wrote a thesis on the *Double Turán Problems*, completing the selective Math Honors Program with approximately 10 participants annually from 300+ math majors; earned the highest distinction.

### 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