

Education

University of California, Los Angeles

- **Ph.D.** Candidate, Mathematics. Aug 2021 – (Jun 2026/Dec 2026)
- Advisor: Andrea L. Bertozzi. (GPA: 3.98/4.00)
- **Masters of Arts** in Mathematics. Aug 2021 – Jun 2022
- Relevant Coursework: Statistical Learning (A+), Mathematical Statistics (A+), High-dimensional Statistics (A+), Optimization (A+), Causal Inference, Numerical Analysis

National University of Singapore

- **Bachelor of Science (Honours)** in Applied Mathematics with Highest Distinction. Aug 2017 – May 2021
- Second Major in Physics and Minor in Statistics. (GPA: 4.97/5.00)
- *Ho Family Prize* – Top graduating student in Applied Mathematics, with 28 A+'s in Math/Physics/Statistics courses.
- *Tan Siak Kew Gold Medal* – Top student in the Faculty of Science in my junior year.
- Relevant Coursework: Probability, Statistical Simulations, Regression Analysis, Mathematics of Machine Learning.

Work Experiences

Incoming Data Scientist Intern, Amazon Jun 2025 – Sep 2025
Graduate Research Assistant, UCLA 2022 – Present

- Programmed a continuum traffic network model from scratch in Python using object-oriented programming (OOP) while incorporating traffic data and ran optimization algorithms for these high-dimensional models.
- Simulated numerical schemes for PDEs and performed penalized regression for fitting polynomials - motivated by experiments in fluid dynamics - in Python, while analyzing their properties using differential topology.

Graduate Teaching Assistant, UCLA 2021 – Present

- Served as a TA and developed 786 pages of detailed notes across 10 quarters with an average teaching feedback score of 8.6/9.0, which includes the following classes:
 - Algorithms, – Mathematical Finance for Math/Econs,
 - Introduction to Probability, – Mathematical Analysis,
 - PDEs, ODEs, and Graduate Applied PDEs, – Calculus of Several Variables (Honors).

Undergraduate Research Assistant, NUS 2020 – 2021

- Developed a novel numerical scheme in R for quantum field theory simulations, incorporating applied harmonic analysis, linear regression, and hypothesis testing methods.
- Collaborated on and co-wrote a 148-page paper on a conjecture in mathematical general relativity.

Undergraduate Research Assistant, UNC – Chapel Hill 2019

- Performed data analysis on astrophysical thermonuclear reaction data using hierarchical models in Bayesian statistics by running Markov chain Monte Carlo samplers in R.

Undergraduate Teaching Assistant, NUS 2019 – 2021

- Served as a TA for discrete structures and programming methodology in Python for 5 semesters.
- Listed on the honor list of student tutors for 2020 and 2021, with average teaching feedback score of 4.8/5.0.

Selected Publications

- *Generic Structural Stability for Riemann Solutions to 2×2 System of Hyperbolic Conservation Laws.*
 A. L. Bertozzi, **H.K. Tan**. || arXiv preprint arXiv:2502.08998.
 Topics: Analysis of PDEs, Differential Topology, Numerical Analysis, Fluid Dynamics.
- *Regularization of Complex Langevin Method.*
 Z. Cai, Y. Kuang, **H.K. Tan**. || Physical Review D 105 (1), 014508.
 Topics: Numerical Analysis, Statistics, Quantum Mechanics.
- *Hierarchical Bayesian Thermonuclear Rate for the 7Be (n, p) 7Li Big Bang Nucleosynthesis Reaction.*
 R.S. de Souza, **H.K. Tan**, A. Coc, C. Iliadis. || The Astrophysical Journal 894 (2), 134.
 Topics: Bayesian Statistics, Astrophysics.

Skills/Others

- *Programming Languages*: Python (Proficient - Packages: NumPy, cvxopt, SciPy, pandas, PyTorch), R (Proficient), SQL (Intermediate; PostgreSQL), LaTeX, Mathematica.
- *Languages*: English & Mandarin Chinese (Native/Bilingual), Japanese (Intermediate).