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Hong Kiat, Tan

Education

University of California, Los Angeles

- **Ph.D.** Candidate, Mathematics. Aug 2021 – (Jun 26/Dec 26)
- 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+), Numerical Analysis (A).

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 during my junior year.
- Relevant Coursework: Probability, Statistical Simulations, Regression Analysis, Mathematics of Machine Learning.

Work Experiences

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 also analyzing their properties using differential topology.

Graduate Teaching Assistant, UCLA 2021 – Present

- Served as a TA and developed 786 pages of detailed notes across 9 quarters with an average teaching feedback score of 8.6/9.0, which includes the following classes:
  - Algorithms,
  - Introduction to Probability,
  - PDEs, ODEs, and Graduate Applied PDEs,
  - Mathematical Finance for Math/Econs,
  - Mathematical Analysis,
  - 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), PostgreSQL (Intermediate), LaTeX, Mathematica.
- *Languages*: English & Mandarin Chinese (Native/Bilingual), Japanese (Intermediate).