Nelvin Tan

Resume

PERSONAL DETAILS

Phone: +65 9363 8261
Email: nelvintan@hotmail.com
Nationality: Singaporean
Websites: Github, personal, google scholar

EDUCATION

Ph.D. – Engineering October 2021 – October 2024
University of Cambridge
Topic: Machine Learning and Information Theory
Division: Information Engineering
Thesis Title: *Approximate Message Passing for Matrix Regression*

B. Comp. (Honours) – Turing Programme (4.68/5.0) August 2017 – May 2021
National University of Singapore
Classification: Highest Distinction (First Class Honours)
Majors: Computer Science and Statistics
Specialization: Algorithms and Theory
Thesis Title: *Fast Splitting Algorithms for Noisy and Sparsity-Constrained Group Testing*

EXPERIENCE

American Express October 2024 – Present
Data Scientist – Manager

- Conducted experiments and implemented systems for the following applications: Document analysis.
- Conducted research in the following topics: Concept drift detection, natural language processing, large language models.

University of Cambridge October 2021 – October 2024
Doctoral Researcher

- Topic: Mixed Regression, Pooled Data, Group Testing
- Designed and mathematically analyzed algorithms for high-dimensional statistical problems.
- Developed numerical simulations to justify the state of the art performance of the developed algorithms.

National University of Singapore June 2019 – June 2021
Undergraduate Researcher

- Topic: Group Testing
- Designed state of the art algorithms for group testing under practical constraints.
- Mathematically analyzed the developed algorithms to show that they use near-optimal number of tests and are time efficient to run.

National University of Singapore January 2018 – April 2018
Teaching Assistant

- Module: CS2030 Programming Methodology II
- Planned, managed, and conducted weekly lab sessions for a class of 40 students.

Singapore Armed Forces, 41 Singapore Armoured Regiment February 2015 – December 2016
Reconnaissance Commander

- Led my tango in battalion-level missions.
- Conducted and assisted in basic military training and specialized reconnaissance training.

SOFTWARE

Programming Languages (Computer Science):	Python (main), SQL, Java, C
Programming Languages (Statistics):	R (main), SAS, SPSS
Others:	LaTeX, Jupyter Notebook, Google Colab

AWARDS

- Honorary Harding Distinguished Postgraduate Scholarship Programme Research Grant 2023
- Cambridge Department of Engineering Scholarship 2021
  (from Harding Distinguished Postgraduate Scholars Programme)
- Cambridge Trust Scholarship 2021
- National University of Singapore Outstanding Undergraduate Researcher Prize 2021
  (certificate) (news article)
- GCE A-Level Academic Excellence Award 2014

SERVICE (REVIEWER)

- IEEE Transactions on Information Theory 2025
- Symposium on the Theory of Computation 2024
- IEEE International Symposium on Information Theory 2023
- IEEE Transactions on Signal Processing 2023
- International Conference on Artificial Intelligence and Statistics 2022

PUBLICATIONS

Publications are listed in reverse chronological order.

Journal Papers:

[6] **Nelvin Tan**, Pablo Pascual Cobo, and Ramji Venkataramanan, "Quantitative Group Testing and Pooled Data in the Linear Regime with Sublinear Tests," *IEEE Transactions on Information Theory*, 2025.

[5] **Nelvin Tan**, Pablo Pascual Cobo, Jonathan Scarlett, and Ramji Venkataramanan, "Approximate Message Passing with Rigorous Guarantees for Pooled Data and Quantitative Group Testing," *SIAM Journal on Mathematics of Data Science (SIMODS)*, 2024.

[4] **Nelvin Tan** and Ramji Venkataramanan, "Mixed Regression via Approximate Message Passing," *Journal of Machine Learning Research (JMLR)*, 2023.

[3] Eric Price, Jonathan Scarlett, and **Nelvin Tan**, "Fast Splitting Algorithms for Noisy and Sparsity-Constrained Group Testing," *Information and Inference: A Journal of the IMA*, 2023.

[2] **Nelvin Tan**, Way Tan, and Jonathan Scarlett, "Performance Bounds for Group Testing With Doubly-Regular Designs," *IEEE Transactions on Information Theory*, 2023.

[1] Oliver Gebhard, Max Hahn-Klimroth, Olaf Parczyk, Manuel Penschuck, Maurice Rolvien, Jonathan Scarlett, and **Nelvin Tan**, "Near Optimal Sparsity-Constrained Group Testing: Improved Bounds and Algorithms," *IEEE Transactions on Information Theory*, 2022.

Conference Papers:

[8] **Nelvin Tan**, Yaowen Zhang, James Asikin Cheung, Fusheng Liu, Yu-Ching Shih, and Dong Yang, "Improved Evidence Extraction for Document Inconsistency Detection with LLMs" *In Submission*, 2026.

[7] **Nelvin Tan**, James Asikin Cheung, Yu-Ching Shih, Dong Yang, and Amol Salunkhe, "Does Using Counterfactual Help LLMs Explain Textual Importance in Classification?", 2025.

[6] **Nelvin Tan**, Zian Seng, Liang Zhang, Yu-Ching Shih, Dong Yang, and Amol Salunkhe, "Improved LLM Agents for Financial Document Question Answering," *In Submission*, 2025.

[5] **Nelvin Tan**, Yu-Ching Shih, Dong Yang, and Amol Salunkhe, "Flexible and Efficient Drift Detection without Labels," *IEEE International Conference on Data Mining Workshops (ICDMW)*, 2025.

[4] **Nelvin Tan**, Pablo Pascual Cobo, and Ramji Venkataramanan, "Quantitative Group Testing and Pooled Data with Sublinear Number of Tests," *International Zurich Seminar on Information and Communication (IZS)*, 2024.

[3] **Nelvin Tan** and Ramji Venkataramanan, "Mixed Linear Regression via Approximate Message Passing," *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2023.

[2] **Nelvin Tan** and Jonathan Scarlett, "An Analysis of the DD Algorithm for Group Testing with Size-Constrained Tests," *IEEE International Symposium on Information Theory (ISIT)*, 2021.

[1] **Nelvin Tan** and Jonathan Scarlett, "Near-Optimal Sparse Adaptive Group Testing," *IEEE International Symposium on Information Theory (ISIT)*, 2020.

Dissertations:

[3] **Nelvin Tan**, "Approximate Message Passing for Matrix Regression," *Ph.D. Thesis (University of Cambridge)*, 2024.

[2] **Nelvin Tan**, "Fast Splitting Algorithms for Noisy and Sparsity-Constrained Group Testing," *Final Year Project (National University of Singapore)*, 2021.

[1] **Nelvin Tan**, "Sparse Group Testing: Bounds and Algorithms," *Undergraduate Research Opportunity Program (National University of Singapore)*, 2020.