

# Nelvin Tan

## Resume

### PERSONAL DETAILS

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**Phone:** +65 9363 8261

**Email:** nelvintan@hotmail.com

**Nationality:** Singaporean; Currently in Singapore as I am finishing up my Ph.D. remotely.

**Websites:** [Github](#), [personal](#), [google scholar](#)

### EDUCATION

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**Ph.D. – Engineering**

October 2021 – September 2024 (expected)

*University of Cambridge*

Topic: Machine Learning and Information Theory

Division: Information Engineering

Thesis Title: *Universality of Approximate Message Passing with Matrix Signals*

**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

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**University of Cambridge**

October 2021 – Present

*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

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**Programming Languages (Computer Science):**

Python (main), SQL, Java, C

**Programming Languages (Statistics):**

R (main), SAS, SPSS

**Others:**

L<sup>A</sup>T<sub>E</sub>X, Jupyter Notebook, Google Colab

## AWARDS

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- 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)

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- 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

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Publications are listed in reverse chronological order.

### Journal Papers:

- [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:

- [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:**

- [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.