

# Nelvin Tan

## Curriculum Vitae

### PERSONAL DETAILS

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**Phone:** +65 9363 8261  
**Email:** nelvintan@hotmail.com  
**Nationality:** Singaporean

### RESEARCH INTERESTS

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I am interested in problems at the intersection of information theory and statistics. More specifically, my research investigates the fundamental limits and algorithmic performances of statistical algorithms.

### EDUCATION

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**Ph.D. – Engineering** October 2021 – September 2024  
*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*

- Group: Signal Processing and Communications
- Topic: Machine Learning and Information Theory  
(Mixed Regression, Pooled Data, Group Testing)
- Supervisor: Ramji Venkataramanan

**National University of Singapore** June 2019 – June 2021  
*Undergraduate Researcher*

- Topic: Machine Learning and Information Theory (Group Testing)
- Supervisor: Jonathan Scarlett

**National University of Singapore** January 2018 – April 2018  
*Teaching Assistant*

- Module: CS2030 Programming Methodology II
- Planned, managed, and conducted weekly lab sessions.

**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.

## SKILLS

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<b>Programming Languages (Computer Science):</b>	Python (main), SQL, Java, C
<b>Programming Languages (Statistics):</b>	R (main), SAS, SPSS

## 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:

- [6] **Nelvin Tan**, Pablo Pascual Cobo, and Ramji Venkataramanan, “Quantitative Group Testing and Pooled Data in the Linear Regime with Sublinear Tests,” *In Submission*, 2024.
- [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:**

- [3] **Nelvin Tan**, “Universality of Approximate Message Passing with Matrix Signals,” *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.