Linh Tran

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EDUCATION

Yale University — Aug 2019 - Present
- PhD in Mathematics. Advisor: Van Vu. — New Haven, CT, USA

National University of Singapore — Aug 2013 - May 2018
- B.S. in Mathematics and Computer Science, summa cum laude. — Singapore, Singapore

PUBLICATIONS AND PREPRINTS

A Functional Proof Pearl: Inverting the Ackermann Hierarchy. In *Proceedings of the 9th ACM SIGPLAN International Conference on Certified Programs and Proofs (CPP 2020)*. — Jan 2020
- Joint with Anshuman Mohan and Prof. Aquinas Hobor. Designed an algorithm to compute the inverse of the Ackermann function in optimal (linear) time for both unary and binary input representations.
- Formalized the algorithm and verified its correctness with with a Coq program.
- Presented at CPP 2020: `http://y2u.be/F35yA6EHrAo` — Jan 2020

Reaching a Consensus on Random Networks: The Power of Few. In *Proceedings of the 24th International Conference on Randomization and Computation (RANDOM 2020)*. — July 2020
- Joint with Prof. Van Vu. Proved a broad sufficient condition for unanimity with high probability in majority dynamics on dense random social networks, and discussed applications in network security and game theory.
- Built a Python program to simulate majority dynamics on various networks and visualize the resulting statistics.
- Presented at RANDOM 2020: `http://y2u.be/6jKWcV65Fr0` — Jul 2020
- Presented at the Pennsylvania State University Math Dept. Seminars in Probability. — Sep 2020

The "Power of Few" Phenomenon: The Sparse Case. *Random Structures and Algorithms, 66: e21260.* — Mar 2024
- Joint with Prof. Van Vu. Generalized the 2020 result concerning unanimity for majority dynamics on $G(n,p)$ random networks up to the connectivity threshold, which is the best possible range of density.
- Expanded the settings to include random activations and updates of individuals in the network and proved the robustness of the power of few phenomenon in the new

A new density limit for unanimity in majority dynamics on random graphs. In preparation. — Nov 2024
- Joint with Prof. Jeong Han Kim. Strengthened the 2023 result for the sparse regime and proved a conjecture by Chakraborti, Kim, Lee and T. Tran (2021).

Fast exact recovery of noisy matrix from few entries: the infinity norm approach. Submitted. — Oct 2024
- Joint with Prof. Van Vu. Proposed a modification to Bhardwaj's and Vu's algorithm (2023) for matrix completion that achieves exact recovery in almost all realistic settings and works without requiring large singular value gaps and smallcondition number of the hidden matrix. The proof contains a new Davis-Kahan type bound for the infinity norm, which has potential for further applications.

SUMMERS SCHOOLS AND CONFERENCES

Workshop in Random Matrices — May 2024
ICERM, Brown University, Providence, RI, USA

Summer School in Random Matrices — May 2023
Ohio State University, Columbus, OH, USA

International Conference on Randomization and Computation (RANDOM) — Jul 2020
Remote, USA

Certified Programs and Proofs (CPP) — Jan 2020
New Orleans, LA, USA

VIASM Summer School in Number Theory — Jun 2018
Vietnam Institute for Advanced Studies in Mathematics, Hanoi, Vietnam

PCMI Summer School in Random Matrices — Jun - Jul 2017
Park City Mathematics Institute, Park City, UT, USA

TEACHING EXPERIENCE

Yale University - Instructor, Calculus 1 & 2 — Falls 2021, 2022, 2023
- Prepared slides and held 2 hours of lectures and 3 office hours each week for a class of 10 - 20 students.

- Collaborated with other instructors to design, proctor and grade 2 midterms and 1 final exam each semester.

Yale University - Teaching Fellow, Math 244: Discrete Mathematics Fall 2022
- Reinforced and supplemented class materials by holding 2 office hours and a one-hour practice session with extra problems and solutions for students.
- Provided correctness checks for and assisted in the grading of the midterm and final exams.

Yale University - Coach, Math 120: Multivariable Calculus Spring 2022
- Clarified and reinforced foundational concepts and developed basic problem solving skills for struggling students by holding 3 weekly one-hour practice sessions tailored to each student's needs.

ACHIEVEMENTS AND AWARDS

- Singapore Mathematical Society's Prize for Best Student in Mathematics. Jul 2018
- First Prize (Top place, team of 4) - NUS IoT Datathon 2018. Mar 2018
- Bronze Medal - International Mathematical Olympiad. Jul 2012

EDITORIAL SERVICE

- Reviewer for *Israel Journal of Mathematics*. Mar 2022
- Reviewer for *IEEE Transactions on Information Theory*. Mar 2024

TECHNICAL SKILLS

- Programming: Python (NumPy, SciPy and Scikit-learn), Java, C++, Scala, SQL, Mathematica, LaTeX.
- Microsoft Office: MS Word, MS Excel, MS Powerpoint.

STUDENT MENTORSHIP

Yale University - Directed Reading Program (DRP) Springs 2021, 2022
- Designed reading curriculum and a research question in Combinatorics and Probability for an undergraduate student to work on during the semester.
- Supervised and gave feedback to the final report by the student.

Projects in Mathematics and Applications (PiMA) Vietnam, 2016 - 2023
Co-founder & Vice President
- Designed contents and oversaw operations of quarterly workshops in applied math topics for high school students.
- Designed and taught introductory mini-courses in Linear Algebra, Mathematical Modelling and Machine Learning at PiMA's annual summer research camps for high school students.
- Planned and managed the admission process for students into PiMA's annual summer camps.
- Cooperated with the president to successfully organize 6 summer camps with an average of 162 applicants and 28 mentees per year.