

EDUCATION

NATIONAL UNIVERSITY OF SINGAPORE
Computer Science PhD

Singapore
Aug 2021 – Ongoing

- Advisors: Arnab Bhattacharyya and Seth Gilbert
- AI Singapore (AISG) PhD Fellow
- Awarded NUS School of Computing Research Achievement Award

ETH ZÜRICH
Computer Science MSc

Zürich, Switzerland
Jul 2020

- *Focus track*: Theoretical Computer Science
- *Masters Thesis* (Advisor: David Steurer)
Studied the statistical-computational gap of sparse tensor PCA, and designed distinguishing & recovery algorithms

NATIONAL UNIVERSITY OF SINGAPORE
Computer Science and Mathematics Double Degree Programme

Singapore
May 2016

- *Computer Science*: Completed focus areas in “Algorithms & Theory” and “Artificial Intelligence”
- *Mathematics*: Majored in Applied Mathematics with additional Mathematics courses such as graduate Recursion Theory
- *Honours*: First Class Honours in Computer Science, First Class Honours in Applied Mathematics, and Dean’s List (top 5%)
- *Computer Science Thesis* (Advisor: Seth Gilbert)
Designed methods to maintain dynamic maximal independent sets
Nominated for NUS Outstanding Undergraduate Researcher Prize (an annual, university-wide competition)
- *Mathematics Thesis* (Advisor: Frank Stephan)
Studied notions of Kolmogorov complexity of binary strings in automata theory and CFGs
- *University Scholars Programme*: A selective (180 students) multidisciplinary academic programme for undergraduates
Awarded President’s Honour Roll which recognizes outstanding academic accomplishments and student-led co-curricular activities

AWARDS

- *NUS School of Computing Research Achievement Award*: Awarded in 2023
- *AISG PhD Fellowship*: Awarded in 2021
- *President’s Honour Roll, USP Scholar*: Awarded in 2016
- *DSTA-DSO Undergraduate Scholarship*: Awarded in 2011

PUBLICATIONS

1. Arnab Bhattacharyya, [Davin Choo](#), Sutanu Gayen, Dimitrios Myrisiotis. *Learnability of Parameter-Bounded Bayes Nets*. ICML workshop Structured Probabilistic Inference & Generative Modeling (SPIGM), 2024.
2. [Davin Choo](#), Themistoklis Gouleakis, Chun Kai Ling, Arnab Bhattacharyya. *Online bipartite matching with imperfect advice*. International Conference on Machine Learning (ICML), 2024.
3. [Davin Choo](#), Yan Hao Ling, Warut Suksompong, Nicholas Teh, Jian Zhang. *Envy-free house allocation with minimum subsidy*. Operations Research Letters (ORL), 2024.
4. [Davin Choo](#), Kirankumar Shiragur, Caroline Uhler. *Causal discovery under off-target interventions*. International Conference on Artificial Intelligence and Statistics (AISTATS), 2024.
5. [Davin Choo](#), Joy Qiping Yang, Arnab Bhattacharyya, Clément L. Canonne. *Learning bounded degree polytrees with samples*. International Conference on Algorithmic Learning Theory (ALT), 2024.
6. Simina Brânzei, [Davin Choo](#), Nicholas Recker. *The Sharp Power Law of Local Search on Expanders*. Symposium on Discrete Algorithms (SODA), 2024.
7. Yuval Dagan, Constantinos Daskalakis, Anthimos-Vardis Kandiros, [Davin Choo](#). *Learning and Testing Latent-Tree Ising Models Efficiently*. Conference on Learning Theory (COLT), 2023.
8. [Davin Choo](#), Kirankumar Shiragur. *Adaptivity Complexity for Causal Graph Discovery*. Uncertainty in Artificial Intelligence (UAI), 2023.
9. [Davin Choo](#), Kirankumar Shiragur. *New metrics and search algorithms for weighted causal DAGs*. International Conference on Machine Learning (ICML), 2023.
10. [Davin Choo](#), Themistoklis Gouleakis, Arnab Bhattacharyya. *Active causal structure learning with advice*. International Conference on Machine Learning (ICML), 2023.

11. Davin Choo, Kirankumar Shiragur. *Subset verification and search algorithms for causal DAGs*. Artificial Intelligence and Statistics (AISTATS), 2023.
12. Davin Choo, Kirankumar Shiragur, Arnab Bhattacharyya. *Verification and search algorithms for causal DAGs*. Conference on Neural Information Processing Systems (NeurIPS), 2022.
13. Arnab Bhattacharyya, Davin Choo, Rishikesh Gajjala, Sutanu Gayen, Yuhao Wang. *Learning Sparse Fixed-Structure Gaussian Bayesian Networks*. Artificial Intelligence and Statistics (AISTATS), 2022.
14. Davin Choo, Tommaso d’Orsi. *The Complexity of Sparse Tensor PCA*. Conference on Neural Information Processing Systems (NeurIPS), 2021.
15. Mélanie Cambus, Davin Choo, Havu Miikonen, Jara Uitto. *Massively Parallel Correlation Clustering in Bounded Arboricity Graphs*. International Symposium on Distributed Computing (DISC), 2021.
16. Davin Choo, Christoph Grunau, Julian Portmann, and Václav Rozhoň. *k-means++: few more steps yield constant approximation*. International Conference on Machine Learning (ICML), 2020.
17. Davin Choo, Mate Soos, Kian Ming A Chai, and Kuldeep S Meel. *Bosphorus: Bridging ANF and CNF Solvers*. Design, Automation & Test in Europe Conference & Exhibition (DATE), pages 468–473. IEEE, 2019.
18. Jing Lim, Joshua Wong, Minn Xuan Wong, Lee Han Eric Tan, Hai Leong Chieu, Davin Choo, and Neng Kai Nigel Neo. *Chemical Structure Elucidation from Mass Spectrometry by Matching Substructures*. Machine Learning for Molecules and Materials (MLMM, a NeurIPS Workshop), 2018.

PREPRINTS

1. Davin Choo, Chandler Squires, Arnab Bhattacharyya, David Sontag. *Probably approximately correct high-dimensional causal effect estimation given a valid adjustment set*, 2024. Preprint available at <https://arxiv.org/abs/2411.08141>.
2. Davin Choo, Chun Kai Ling. *A short note about the learning-augmented secretary problem*, 2024. Preprint available at <https://arxiv.org/abs/2410.06583>.

PROFESSIONAL SERVICE

- Reviewer for Conference on Neural Information Processing Systems (NeurIPS), 2024; **Top reviewer**
- Reviewer for International Conference on Machine Learning (ICML), 2024
- Reviewer for International Joint Conference on Artificial Intelligence (IJCAI), 2024
- Reviewer for International Conference on Artificial Intelligence and Statistics (AISTATS), 2024
- Subreviewer for Innovations in Theoretical Computer Science (ITCS), 2024
- Reviewer for Conference on Neural Information Processing Systems (NeurIPS), 2023; **Top reviewer**
- Subreviewer for Symposium on Theory of Computing (STOC), 2023
- Subreviewer for International Colloquium on Automata, Languages, and Programming (ICALP), 2023
- Reviewer for International Conference on Artificial Intelligence and Statistics (AISTATS), 2023
- Subreviewer for Conference on Learning Theory (COLT), 2022
- Subreviewer for Scandinavian Symposium and Workshops on Algorithm Theory (SWAT), 2022
- Subreviewer for European Symposium on Algorithms (ESA), 2020

TEACHING

NATIONAL UNIVERSITY OF SINGAPORE	Singapore
Teaching Assistant — GET1031, GEI1000	Aug 2021 – Dec 2021
<ul style="list-style-type: none"> • Collaborated with 2 faculty members on refining teaching materials and pedagogies to suit student needs • Led discussion groups for a total of 64 students on the topic of computational thinking 	
NATIONAL UNIVERSITY OF SINGAPORE	Singapore
Teaching Assistant — CS1101S, CS1231, CS2020, CS3230, CS4344, GET1031	Aug 2012 – May 2016
<ul style="list-style-type: none"> • Collaborated with over 8 faculty members on refining teaching materials and pedagogies to suit student needs • Led discussion groups for a total of 86 students across 6 different courses on topics including programming methodology, computational thinking, data structures and algorithms, design and analysis of algorithms, and discrete structures • Averaged a feedback score of 4.7/5 across all tutored courses (faculty average: 4.16/5) with 15 nominations for Best Teaching 	
NATIONAL UNIVERSITY OF SINGAPORE	Singapore
University Scholars Programme (USP) Mentor	Aug 2012 – May 2016
TEMASEK JUNIOR COLLEGE	Singapore
Course Instructor	Jan 2014 – May 2014
<ul style="list-style-type: none"> • Initiated a student outreach programme to encourage young students to explore the field of Computer Science 	

WORK EXPERIENCE

ETH ZÜRICH	Zürich, Switzerland
Post-diplomand (Post-graduate research position under David Steurer)	Aug 2020 – Mar 2021
DSO NATIONAL LABORATORIES	Singapore
Research Scientist — Information Exploitation Lab (IEL)	Jun 2016 – Sep 2018
<ul style="list-style-type: none">Applied AI techniques to security related problems, including cryptanalysis, SAT solving and reverse engineering	
DSO NATIONAL LABORATORIES	Singapore
Research Intern — Cognitive Fusion Lab (CFL)	May 2013 – Jul 2013
<ul style="list-style-type: none">Worked on a research project to improve the performance of speech-to-text recognition	
DEFENCE SCIENCE & TECHNOLOGY AGENCY (DSTA)	Singapore
Research Intern — C4I development (PC8)	Feb 2011 – May 2011
<ul style="list-style-type: none">Designed an in-house Unmanned Aerial Vehicle (UAV) algorithm that maps image points to actual geolocation coordinates	

ADDITIONAL INFORMATION

- Visiting PhD student of Bernhard Schölkopf at Empirical Inference group of Max Planck Institute for Intelligent Systems: Summer 2023
- Visiting graduate student to the Simons Institute for the Theory of Computing under the Causality programme: Spring 2022
- Languages/Technologies*: Java, C++, Python, Javascript, MiniZinc, C, C#, Scheme (Basic), Prolog (Basic)
- Computer Science UROP*: Worked on a reductionist approach to computer vision with applications in robot grasping with uncertainty
- (Class project) RoCoCo*: Used constraint programming to design a web-based round robin tournament scheduling algorithm
- (Class project) Poker AI Bot*: Implemented a 2 Player Limit Texas Hold 'em Poker bot using Monte Carlo Tree Search techniques
- (Class project) Robust Airport Scheduling*: Devised and analysed algorithms for airport gate scheduling. Solution was robust enough to minimise collisions when random delays were introduced to perturb a dataset of actual departure and arrival times