

Davin Choo

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EDUCATION

NATIONAL UNIVERSITY OF SINGAPORE

Singapore

Computer Science PhD

Aug 2021 – Nov 2024

- Advisors: Arnab Bhattacharyya and Seth Gilbert
- AI Singapore (AISG) PhD Fellow
- Awarded NUS School of Computing Research Achievement Award
- *PhD Thesis*: Learning Probabilistic and Causal Models with(out) Imperfect Advice

ETH ZÜRICH

Zürich, Switzerland

Computer Science MSc

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

Singapore

Computer Science and Mathematics Double Degree Programme

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%)
- *Turing Programme*: Invitation-only special programme in SoC aimed to nurture students who aspire to engage in research careers
- *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
- *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

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](#), Philips George John, Themistoklis Gouleakis. *Learning multivariate Gaussians with imperfect advice*. International Conference on Machine Learning (ICML), 2025.
2. [Davin Choo](#), Chandler Squires, Arnab Bhattacharyya, David Sontag. *Probably approximately correct high-dimensional causal effect estimation given a valid adjustment set*. Conference on Causal Learning and Reasoning (CLearR), 2025.
3. Arnab Bhattacharyya, [Davin Choo](#), Sutanu Gayen, Dimitrios Myrasiotis. *Learnability of Parameter-Bounded Bayes Nets*. AAAI Conference on Artificial Intelligence (AAAI), 2025. Also presented in ICML workshop Structured Probabilistic Inference & Generative Modeling (SPIGM), 2024.
4. [Davin Choo](#), Themistoklis Gouleakis, Chun Kai Ling, Arnab Bhattacharyya. *Online bipartite matching with imperfect advice*. International Conference on Machine Learning (ICML), 2024.
5. [Davin Choo](#), Yan Hao Ling, Warut Suksompong, Nicholas Teh, Jian Zhang. *Envy-free house allocation with minimum subsidy*. Operations Research Letters (ORL), 2024.
6. [Davin Choo](#), Kirankumar Shiragur, Caroline Uhler. *Causal discovery under off-target interventions*. International Conference on Artificial Intelligence and Statistics (AISTATS), 2024.
7. [Davin Choo](#), Joy Qiping Yang, Arnab Bhattacharyya, Clément L. Canonne. *Learning bounded degree polytrees with samples*. International Conference on Algorithmic Learning Theory (ALT), 2024.
8. Simina Brânzei, [Davin Choo](#), Nicholas Recker. *The Sharp Power Law of Local Search on Expanders*. Symposium on Discrete Algorithms (SODA), 2024.
9. Yuval Dagan, Constantinos Daskalakis, Anthimos-Vardis Kandiros, [Davin Choo](#). *Learning and Testing Latent-Tree Ising Models Efficiently*. Conference on Learning Theory (COLT), 2023.

10. [Davin Choo](#), Kirankumar Shiragur. *Adaptivity Complexity for Causal Graph Discovery*. Uncertainty in Artificial Intelligence (UAI), 2023.
11. [Davin Choo](#), Kirankumar Shiragur. *New metrics and search algorithms for weighted causal DAGs*. International Conference on Machine Learning (ICML), 2023.
12. [Davin Choo](#), Themistoklis Gouleakis, Arnab Bhattacharyya. *Active causal structure learning with advice*. International Conference on Machine Learning (ICML), 2023.
13. [Davin Choo](#), Kirankumar Shiragur. *Subset verification and search algorithms for causal DAGs*. Artificial Intelligence and Statistics (AISTATS), 2023.
14. [Davin Choo](#), Kirankumar Shiragur, Arnab Bhattacharyya. *Verification and search algorithms for causal DAGs*. Conference on Neural Information Processing Systems (NeurIPS), 2022.
15. Arnab Bhattacharyya, [Davin Choo](#), Rishikesh Gajjala, Sutanu Gayen, Yuhao Wang. *Learning Sparse Fixed-Structure Gaussian Bayesian Networks*. Artificial Intelligence and Statistics (AISTATS), 2022.
16. [Davin Choo](#), Tommaso d’Orsi. *The Complexity of Sparse Tensor PCA*. Conference on Neural Information Processing Systems (NeurIPS), 2021.
17. Mélanie Cambus, [Davin Choo](#), Havu Miikonen, Jara Uitto. *Massively Parallel Correlation Clustering in Bounded Arboricity Graphs*. International Symposium on Distributed Computing (DISC), 2021.
18. [Davin Choo](#), Christoph Grunau, Julian Portmann, and Václav Rozhoň. *k-means++: few more steps yield constant approximation*. International Conference on Machine Learning (ICML), 2020.
19. [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.
20. 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 (SEE MY WEBSITE FOR ARXIV LINKS)

1. [Davin Choo](#), Winston Fu, Derek Khu, Tzeh Yuan Neoh, Tze-Yang Poon, Nicholas Teh. *Approximate Proportionality in Online Fair Division*, 2025.
2. [Davin Choo](#), Yohai Trabelsi, Fentabil Getnet, Samson Warkaye Lamma, Wondesen Nigatu, Kasahun Sime, Lisa Matay, Milind Tambe, Stéphane Verguet. *Optimizing Health Coverage in Ethiopia: A Learning-augmented Approach and Persistent Proportionality Under an Online Budget*, 2025.
3. [Davin Choo](#), Yuqi Pan, Tonghan Wang, Milind Tambe, Alastair van Heerden, Cheryl Johnson. *Adaptive Frontier Exploration on Graphs with Applications to Network-Based Disease Testing*, 2025.
4. [Davin Choo](#), Billy Jin, Yongho Shin. *Learning-Augmented Online Bipartite Fractional Matching*, 2025.
5. Arnab Bhattacharyya, [Davin Choo](#), Philips George John, Themis Gouleakis. *Product Distribution Learning with Imperfect Advice*, 2025.
6. Jia Peng Lim, Shawn Tan, [Davin Choo](#), Hady W. Lauw. *A partition cover approach to tokenization*, 2025.
7. [Davin Choo](#), Chun Kai Ling. *A short note about the learning-augmented secretary problem*, 2024.

PROFESSIONAL SERVICE

- Program Committee for AAAI Conference on Artificial Intelligence (AAAI), 2026
- Reviewer for Conference on Neural Information Processing Systems (NeurIPS), 2025
- Reviewer for Transactions on Machine Learning Research (TMLR), 2025
- Reviewer for International Conference on Machine Learning (ICML), 2025
- Reviewer for International Joint Conference on Artificial Intelligence (IJCAI), 2025
- 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

- 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

- 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

- Initiated a student outreach programme to encourage young students to explore the field of Computer Science

WORK EXPERIENCE

HARVARD UNIVERSITY Cambridge, Massachusetts
Postdoctoral Fellow (in Teamcore with Milind Tambe) Dec 2024 – Present

- Working with domain experts in health and policy to translate high-level policy goals into formal problem statements
- Applying tools and techniques from Computer Science to design effective AI/ML solutions

ETH ZÜRICH Zürich, Switzerland
Post-diplomand (Post-graduate research position, with David Steurer) Aug 2020 – Mar 2021

DSO NATIONAL LABORATORIES Singapore
Research Scientist — Information Exploitation Lab (IEL) Jun 2016 – Sep 2018

- 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

- 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

- 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*: Python, C++, Java, Javascript, SAT solvers, MiniZinc, C, C#, Scheme (Basic), Prolog (Basic)