Tuan Dung "Josh" Nguyen Curriculum Vitae

Department of Computer and Information Science
University of Pennsylvania
Philadelphia, PA 19104, USA

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Education

Ph.D. in Computer and Information Science — 2023–
University of Pennsylvania — Philadelphia, PA, USA
Advisor: Duncan Watts

M.Phil. in Computer Science — 2021–2023
Australian National University — Canberra, ACT, AU
Advisors: Lexing Xie and Colin Klein

B.S. in Computing and Software Systems — 2018–2020
University of Melbourne — Melbourne, VIC, AU
First class honours

Experience

Visiting Student — 2024–
Argonne National Laboratory — Lemont, IL, USA
Collaborator: Sandeep Madireddy

Research Associate — 2023–2023
Australian National University — Canberra, ACT, AU
Collaborators: Yuan-Sen Ting

Summer Research Scholar — 2020–2021
Australian National University — Canberra, ACT, AU
Advisor: Lexing Xie

Research Intern — 2019–2020
University of Sydney — Sydney, NSW, AU
Advisor: Nguyen Tran

Vacation Research Scholar — 2019–2019
University of Melbourne — Melbourne, VIC, AU
Advisor: Charl Ras

Honors & Awards

Academic Event Fund Award, Graduate and Professional Student Assembly, University of Pennsylvania, 2025.

Conference Travel Grant, School of Engineering and Applied Science, University of Pennsylvania, 2024.

George M. Ball, Jr. First-Year Ph.D. Fellowship, Department of Computer and Information Science, University of Pennsylvania, 2023.

Ph.D. Fellowship, Department of Computer and Information Science, University of Pennsylvania, 2023–.

Vice-Chancellor's Travel Grant – Higher Degree Research, Australian National University, 2022.

M.Phil. Scholarship, Australian National University, 2021–2023.

Summer Research Scholarship, Australian National University, 2020.

Project Award, Innovation Expo, Vietnam-Australia Innovation Network (NIC-AU), 2020.

Dean's Honour List, Faculty of Science, University of Melbourne, 2018–2020.

Undergraduate Student Scholarship, Faculty of Science, University of Melbourne, 2020.

Summer Research Scholarship, Faculty of Engineering, University of Sydney, 2020.

Summer Research Scholarship, School of Mathematics and Statistics, University of Melbourne, 2019.

RESEARCH INTERESTS

Computational Social Science, Artificial Intelligence, Complex Systems, Machine Learning, Social Psychology, Natural Language Processing, Cognitive Science, Network Science, Sociology of Knowledge, Operations Research, Statistics, and Artificial Intelligence for Science.

PUBLICATIONS

Google Scholar: `https://scholar.google.com/citations?user=mmy1v8oAAAAJ`

Semantic Scholar: `https://semanticscholar.org/author/Tuan-Dung-Nguyen/2116225572`

ORCID: `https://orcid.org/0000-0002-1105-005X`

Web of Science: `https://www.webofscience.com/wos/author/record/JLL-7306-2023`

PEER-REVIEWED JOURNAL ARTICLES

1. Tijmen de Haan, Yuan-Sen Ting, Tirthankar Ghosal, **Tuan Dung Nguyen**, Alberto Accomazzi, Azton Wells, Nesar Ramachandra, Rui Pan, and Zechang Sun. "Achieving GPT-4o Level Performance in Astronomy with a Specialized 8B-parameter Large Language Model." *Scientific Reports* 15(1): 13751 (2025).

2. Yuan-Sen Ting, **Tuan Dung Nguyen**, Tirthankar Ghosal, Rui Pan, Hardik Arora, Zechang Sun, Tijmen de Haan, Nesar Ramachandra, Azton Wells, Sandeep Madireddy, and Alberto Accomazzi. "AstroMLab 1: Who Wins Astronomy Jeopardy!?." *Astronomy and Computing* 51: 100893 (2025).

3. Long Tan Le, Tung-Anh Nguyen, **Tuan Dung Nguyen**, Nguyen H. Tran, Nguyen Binh Truong, Phuong L. Vo, Bui Thanh Hung, and Tuan Anh Le. "Distributionally Robust Federated Learning for Mobile Edge Networks." *Mobile Networks and Applications* 29: 262–272 (2024).

4. Tung-Anh Nguyen, Long Tan Le, **Tuan Dung Nguyen**, Wei Bao, Suranga Seneviratne, Choong Seon Hong, and Nguyen H. Tran. "Federated PCA on Grassmann Manifold for IoT Anomaly Detection." *IEEE/ACM Transactions on Networking* 34(5): 4456–4471 (2024).

5. Canh T. Dinh, Nguyen H. Tran, **Tuan Dung Nguyen**, Wei Bao, Amir Rezaei Balef, Bing B. Zhou, and Albert Y. Zomaya. "DONE: Distributed Approximate Newton-type Method for Federated Edge Learning." *IEEE Transactions on Parallel and Distributed Systems* 33(11): 2648–2660 (2022).

6. **Tuan Dung Nguyen**, Amir R. Balef, Canh T. Dinh, Nguyen H. Tran, Duy T. Ngo, Tuan Anh Le, and Phuong L. Vo. "Accelerating Federated Edge Learning." *IEEE Communications Letters* 25(10): 3282–3286 (2021).

PEER-REVIEWED CONFERENCE PAPERS

1. Long Tan Le, **Tuan Dung Nguyen**, Tung-Anh Nguyen, Choong Seon Hong, Suranga Seneviratne, Wei Bao, and Nguyen H. Tran. "Federated Deep Equilibrium Learning: Harnessing Compact Global Representations to Enhance Personalization." *Proceedings of the 33rd ACM International Conference on Information and Knowledge Management*, 1132–1142 (2024).

2. Anh Duc Nguyen, **Tuan Dung Nguyen**, Quang Minh Nguyen, Hoang H. Nguyen, Lam M. Nguyen, and Kim-Chuan Toh. "On Partial Optimal Transport: Revising the Infeasibility of Sinkhorn and Efficient Gradient Methods." *Proceedings of the AAAI Conference on Artificial Intelligence* 38, 8090–8098 (2024).

3. **Tuan Dung Nguyen**, Ziyu Chen, Nicholas George Carroll, Alasdair Tran, Colin Klein, and Lexing Xie. "Measuring Moral Dimensions in Social Media with Mformer." *Proceedings of the International AAAI Conference on Web and Social Media* 18, 1134–1147 (2024).

4. **Tuan Dung Nguyen**, Georgiana Lyall, Alasdair Tran, Minjeong Shin, Nicholas George Carroll, Colin Klein, and Lexing Xie. "Mapping Topics in 100,000 Real-Life Moral Dilemmas." *Proceedings of the International AAAI Conference on Web and Social Media* 16, 699–710 (2022).

5. Canh T. Dinh, Nguyen H. Tran, and **Tuan Dung Nguyen**. "Personalized Federated Learning with Moreau Envelopes." *Proceedings of the 34th International Conference on Neural Information Processing Systems*, 21394–21405 (2020).

6. Canh T. Dinh, Nguyen H. Tran, **Tuan Dung Nguyen**, Wei Bao, Albert Y. Zomaya, and Bing B. Zhou. "Federated Learning with Proximal Stochastic Variance Reduced Gradient Algorithms." *Proceedings of the 49th International Conference on Parallel Processing*, 1–11 (2020).

Theses

1. **Tuan Dung Nguyen**. *Data-Driven Understanding of Real-Life Moral Dilemmas via Topic Mapping and Moral Foundations.* M.Phil. Thesis. Canberra, ACT: Australian National University, 2023.

Workshop & Other Papers

1. Tijmen de Haan, Yuan-Sen Ting, Tirthankar Ghosal, **Tuan Dung Nguyen**, Alberto Accomazzi, Emily Herron, Vanessa Lama, Rui Pan, Azton Wells, and Nesar Ramachandra. "AstroMLab 4: Benchmark-Topping Performance in Astronomy Q&A with a 70B-Parameter Domain-Specialized Reasoning Model." *Proceedings of the Workshop on Machine Learning for Astrophysics (ICML'25)*, 1–9 (2025).

2. Rui Pan, **Tuan Dung Nguyen**, Hardik Arora, Alberto Accomazzi, Tirthankar Ghosal, and Yuan-Sen Ting. "AstroMLab 2: AstroLLaMA-2-70B Model and Benchmarking Specialised LLMs for Astronomy." *SC24-W: Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*, 87–96 (2024).

3. Ernest Perkowski, Rui Pan, **Tuan Dung Nguyen**, Yuan-Sen Ting, Sandor Kruk, Tong Zhang, Charlie O'Neill, Maja Jablonska, Zechang Sun, Michael J. Smith, Huiling Liu, Kevin Schawinski, Kartheik Iyer, Ioana Ciucă, and UniverseTBD. "AstroLLaMA-Chat: Scaling AstroLLaMA with Conversational and Diverse Datasets." *Research Notes of the AAS* 8(1): 7 (2024).

4. **Tuan Dung Nguyen**, Yuan-Sen Ting, Ioana Ciucă, Charles O'Neill, Ze-Chang Sun, Maja Jabłońska, Sandor Kruk, Ernest Perkowski, Jack Miller, Jason Jingshi Li, et al. "AstroLLaMA: Towards Specialized Foundation Models in Astronomy." *Proceedings of the Second Workshop on Information Extraction from Scientific Publications (IJCNLP-AACL)*, 49–55 (2023).

Preprints

1. Franck Cappello, Sandeep Madireddy, Robert Underwood, Neil Getty, Nicholas Lee-Ping Chia, Nesar Ramachandra, **Tuan Dung Nguyen**, Murat Keceli, Tanwi Mallick, Zilinghan Li, et al. "EAIRA: Establishing a Methodology for Evaluating AI Models as Scientific Research Assistants." 2025. arXiv: 2502.20309.

2. **Tuan Dung Nguyen**, Duncan J. Watts, and Mark E. Whiting. "Empirically Evaluating Commonsense Intelligence in Large Language Models with Large-Scale Human Judgments." 2025. arXiv: 2505.10309.

Teaching

COMM 3200 *Common Sense vs. Data Science in Communications Research and Practice*, University of Pennsylvania, 2024. Teaching assistant.

COMP4650 *Document Analysis*, Australian National University, 2022. Teaching assistant.

COMP4680 *Advanced Topics in Machine Learning*, Australian National University, 2022. Teaching assistant and guest lecturer.

COMP4670 *Statistical Machine Learning*, Australian National University, 2022–2023. Teaching assistant.

COMP5318 *Machine Learning and Data Mining*, University of Sydney, 2021. Teaching assistant.

COMP4691 *Optimisation*, Australian National University, 2021. Teaching assistant.

COMP30024 *Artificial Intelligence*, University of Melbourne, 2021. Teaching assistant.

COMP20008 *Elements of Data Processing*, University of Melbourne, 2020–2022. Teaching assistant.

LECTURES, TALKS & PRESENTATIONS

"Natural Language Processing for Computational Social Science." Summer Institute in Computational Social Science, University of Pennsylvania, July 2025.

"Exploring Political Attitudes under Selective Media Consumption with Large Language Models." International Conference on Computational Social Science, July 2025.

"Evaluating Commonsense Knowledge in Human and Large Language Model-Simulated Populations." 11th International Conference on Computational Social Science, July 2025.

"Benchmarking Specialized LLMs for Astronomy." International Conference for High Performance Computing, Networking, Storage, and Analysis (Atlanta, GA), November 2024.

"Leveraging Large-Scale Human Opinions to Evaluate Language Models' Common Sense." 10th International Conference on Computational Social Science (Philadelphia, PA), July 2024.

"Natural Language Processing for Computational Social Science Research." Summer Institute in Computational Social Science, University of Pennsylvania, July 2024.

"Measuring Moral Dimensions on Social Media with Mformer." 18th International AAAI Conference on Web and Social Media (Buffalo, NY), June 2024. (Spotlight presentation.)

"How Aligned are Humans and Language Models on Common Sense?" Generative AI and Social Science Research Workshop, Yale University Institution for Social and Public Policy and Data-Intensive Social Science Center, April 2024.

"Science Meets AI: Lessons from the Exploration of LLMs in Astronomical Research." Planet+AI Consortium, online, February 2024.

"AstroLLaMA: Towards Specialized Foundation Models in Astronomy." International Joint Conference on Natural Language Processing and the 3rd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics, online, November 2023.

"Data-Driven Understanding of Real-Life Moral Dilemmas." AI, ML and Friends Seminar, Australian National University, April 2023.

"Introduction to Computational Optimal Transport." Advanced Topics in Machine Learning, Australian National University, November 2022.

"Mapping Topics in 100,000 Real-Life Moral Dilemmas." AI, ML and Friends Seminar, Australian National University, May 2022; 16th International Conference on Web and Social Media, June 2022.

"Personalized Federated Learning with Moreau Envelopes." 34th Annual Conference on Neural Information Processing Systems, online, December 2020.

"Federated Learning with Proximal Stochastic Variance Reduced Gradient Algorithms." 49th International Conference on Parallel Processing, online, August 2020.

OTHERS

Organizer and Teaching Assistant, Summer Institute in Computational Social Science, University of Pennsylvania, 2025.

Dean's Advisory Board Member, School of Engineering and Applied Science, University of Pennsylvania, 2024.

Teaching Assistant, Summer Institute in Computational Social Science, University of Pennsylvania, 2024.

Fellow, Vietnam Education Network 2.0 (VEF) Progam, 2022.

Student, Monash University International School in Artificial Intelligence and its Applications in Computer Science, 2021.

Student Volunteer, AAAI/ACM Conference on AI, Ethics and Society, 2021.

Student Volunteer. International AAAI Conference on Web and Social Media, 2021.

Student, Cornell, Maryland and Max Planck Pre-Doctoral Research School, 2021.

Secretary, University of Melbourne Competitive Programming Club, 2019–2020.

Undergraduate Representative, Melbourne University Mathematics and Statistics Society, 2019–2020.

Committee Member, University of Melbourne Internet of Things Club, 2018–2020.

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