TUAN DUNG "JOSH" NGUYEN

Department of Computer and Information Science
School of Engineering and Applied Science
University of Pennsylvania
Philadelphia, PA 19104, United States
Email: joshtn@seas.upenn.edu
Website: https://joshnguyen.net

EDUCATION

Ph.D. in Computer and Information Science 2023–now
University of Pennsylvania *Philadelphia, PA, United States*
Advisor: Duncan Watts

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

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

EXPERIENCE

Visiting Student 2024–now
Mathematics and Computer Science Division, Argonne National Laboratory *Lemont, IL, United States*
Collaborator: Sandeep Madireddy
Project: *Holistic Evaluation of Large Language Models in Specialized Scientific Domains*

Research Associate 2023–2023
Research School of Astronomy, Australian National University *Canberra, ACT, Australia*
Collaborators: Yuan-Sen Ting and Ioana Ciucă
Project: *Large Language Models for Astronomical Research*

Summer Research Scholar 2020–2021
Computational Media Lab, Australian National University *Canberra, ACT, Australia*
Advisor: Lexing Xie
Project: *Data-Driven Understanding of Real-Life Moral Dilemmas*

Research Intern 2019–2020
Faculty of Engineering, University of Sydney *Sydney, NSW, Australia*
Advisor: Nguyen Tran
Project 1: *Federated Learning with Stochastic Variance Reduced Gradient Algorithms*
Project 2: *Personalized Federated Learning with Moreau Envelopes* (Best CS Project)

Vacation Research Scholar 2019–2019
School of Mathematics and Statistics, University of Melbourne *Melbourne, VIC, Australia*
Advisor: Charl Ras
Project: *Analysis and Design of R-Resilient Graph Embeddings*

RESEARCH INTERESTS

Computational Social Science, Machine Learning, Natural Language Processing, Cognitive Science, Social Psychology, Network Science, Commonsense Knowledge and Intelligence, Numerical Optimization, Statistics, Practical Ethics and Artificial Intelligence for Science.

HONORS AND AWARDS

Conference 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–now.

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

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

Undergraduate Student Scholarship, 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.

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`

REFEREED JOURNAL ARTICLES

[1] 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". In: *Mobile Networks and Applications* (2024). DOI: 10.1007/s11036-024-02316-w.

[2] 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". In: *IEEE/ACM Transactions on Networking (forthcoming)* (2024). DOI: 10.1109/TNET.2024.3423780.

[3] 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". In: *IEEE Transactions on Parallel and Distributed Systems* 33.11 (2022), pp. 2648–2660. DOI: 10.1109/TPDS.2022.3146253.

[4] **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". In: *IEEE Communications Letters* 25.10 (2021), pp. 3282–3286. DOI: 10.1109/LCOMM.2021.3103536.

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: A Compact Shared Representation for Edge Communication Efficiency". In: *Proceedings of the ACM International Conference on Information and Knowledge Management (CIKM 2024) (Forthcoming)*. 2024. DOI: 10.1145/3627673.3679752.

[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". In: *Proceedings of the AAAI Conference on Artificial Intelligence* 38.8 (2024), pp. 8090–8098. DOI: 10.1609/aaai.v38i8.28648.

[3] **Tuan Dung Nguyen**, Ziyu Chen, Nicholas George Carroll, Alasdair Tran, Colin Klein, and Lexing Xie. "Measuring Moral Dimensions in Social Media with Mformer". In: *Proceedings of the International AAAI Conference on Web and Social Media* 18.1 (2024), pp. 1134–1147. DOI: 10.1609/icwsm.v18i1.31378.

[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". In: *Proceedings of the International AAAI Conference on Web and Social Media* 16.1 (2022), pp. 699–710. DOI: 10.1609/icwsm.v16i1.19327.

[5] Canh T. Dinh, Nguyen H. Tran, and **Tuan Dung Nguyen**. "Personalized Federated Learning with Moreau Envelopes". In: *Advances in Neural Information Processing Systems*. Vol. 33. 2020, pp. 21394–21405. DOI: 10.48550/arXiv.2006.08848.

[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". In: *Proceedings of the 49th International Conference on Parallel Processing (ICPP '20)*. 2020, pp. 1–11. DOI: 10.1145/3404397.3404457.

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. DOI: 10.25911/9ZCS-SJ43.

WORKSHOP AND NON-PEER-REVIEWED PAPERS

[1] 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". In: *Research Notes of the AAS* 8.1 (2024), p. 7. DOI: 10.3847/2515-5172/ad1abe.

[2] **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, Josh Peek, Kartheik Iyer, Tomasz Różański, Pranav Khetarpal, Sharaf Zaman, David Brodrick, Sergio J. Rodríguez Méndez, Thang Bui, Alyssa Goodman, Alberto Accomazzi, Jill Naiman, Jesse Cranney, Kevin Schawinski, and Roberta Răileanu. "AstroLLaMA: Towards Specialized Foundation Models in Astronomy". In: *Proceedings of the Second Workshop on Information Extraction from Scientific Publications (IJCNLP-AACL)*. 2023, pp. 49–55. DOI: 10.18653/v1/2023.wiesp-1.7.

PREPRINTS

[1] 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!?* 2024. DOI: 10.48550/arXiv.2407.11194.

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 AND PRESENTATIONS

"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

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

Last compiled: August 2, 2024