Duong T. A. Nguyen (Ella)

School of Electrical, Computer and Energy Engineering
Arizona State University
Tempe, AZ 85281

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Research Interest

My research interests lie at the intersection of Optimization, Operations Research, and Game Theory. The research focuses on developing algorithms for distributed optimization, mathematical models and optimization solutions for decision-making under uncertainty, fair and privacy-preserving mechanism designs. Research applications include cloud/edge computing, electric vehicles, healthcare, and large-scale multi-agent systems.

Education

Ph.D. student — Jan 2021 – May 2025
School of Electrical, Computer and Energy Engineering, Arizona State University — *Tempe, Arizona*

M.S. in Applied Mathematics — Aug 2017 – Dec 2019
Department of Mathematics, University of Louisiana at Lafayette — *Lafayette, Louisiana*

Research Experience

Research Intern *(Upcoming)* — Sep 2024 – Dec 2024
Los Alamos National Laboratory — *Los Alamos, New Mexico*

Research Intern *(Upcoming)* — Jun 2024 – Aug 2024
AT&T Labs Research — *Bedminster, New Jersey*
Advisor: Dr. Matti Hiltunen

Visiting Student Research Collaborator *(Upcoming)* — Apr 2024 – May 2024
Princeton University — *Princeton, New Jersey*
Advisor: Prof. H. Vincent Poor

Research Assistant — Dec 2020 – Present
Arizona State University — *Tempe, Arizona*
Advisor: Dr. Duong Tung Nguyen

Research and Development Intern — May 2023 – Aug 2023
Aspen Technology Inc. — *Houston, Texas*
Advisor: Dr. Josephine Elia

Research Assistant — Jan 2019 – Dec 2020
University of Louisiana at Lafayette — *Lafayette, Louisiana*
Advisor: Dr. Longfei Li

Publications

Journal Publications

1. Duong T. A. Nguyen, Duong T. Nguyen, Angelia Nedić, **Accelerated AB/Push-Pull Methods for Distributed Optimization over Time-Varying Directed Networks**, IEEE Transactions on Control of Network Systems, 2023.
2. Angelia Nedić, Duong T. A. Nguyen, Duong T. Nguyen, **AB/Push-Pull Method for Distributed Optimization in Time-Varying Directed Networks**, Optimization Methods and Software, 2023.
3. Duong T. A. Nguyen, Duong T. Nguyen, Angelia Nedić, **Geometric Convergence of Distributed Heavy-Ball Nash Equilibrium Algorithm over Time-Varying Digraphs with Unconstrained Actions**, IEEE Control Systems Letters, 2023.
4. Duong T. A. Nguyen, Mattia Bianchi, Florian Dörfler, Duong T. Nguyen, Angelia Nedić, **Nash Equilibrium Seeking Over Row-Stochastic Digraphs With Network Independent Step-sizes**, IEEE Control Systems Letters, 2023.

5. Duong T. A. Nguyen, Jiaming Cheng, Ni Trieu, Duong T. Nguyen, **A Fairness-Aware Attacker-Defender Model for Optimal Edge Network Operation and Protection**, IEEE Networking Letters, 2023.
6. Duong T. A. Nguyen, Longfei Li, Hangjie Ji, **Stable and Accurate Algorithms for Generalized Kirchhoff-Love Plates**, Journal of Engineering Mathematics, 2021.

Conference Proceedings

1. Duong T. A. Nguyen, Mattia Bianchi, Florian Dörfler, Duong T. Nguyen, Angelia Nedić, **Nash Equilibrium Seeking Over Row-Stochastic Digraphs With Network Independent Step-sizes**, Proceedings of the American Control Conference (ACC), Toronto, ON, Canada, 2024.
2. Jiaming Cheng, Duong T. A. Nguyen, Duong T. Nguyen, **Two-Stage Distributionally Robust Edge Node Placement Under Endogenous Demand Uncertainty**. Proceedings of the IEEE International Conference on Computer Communications (INFOCOM), Vancouver, BC, Canada, 2024
3. Duong T. A. Nguyen*, Jiaming Cheng*, Ni Trieu, Duong T. Nguyen, **Optimal Workload Allocation for Distributed Edge Clouds With Renewable Energy and Battery Storage**, Proceedings of the International Conference on Computing, Networking and Communication, HI, USA, 2024.
4. Duong T. A. Nguyen, Duong T. Nguyen, Angelia Nedić, **Geometric Convergence of Distributed Heavy-Ball Nash Equilibrium Algorithm over Time-Varying Digraphs with Unconstrained Actions**, Proceedings of the 62nd IEEE Conference on Decision and Control (CDC), Singapore, 2023.
5. Duong T. A. Nguyen, Duong T. Nguyen, Angelia Nedić, **Distributed Stochastic Optimization with Gradient Tracking over Time-Varying Directed Networks**, Proceedings of the 57th IEEE Asilomar Conference on Signals, Systems, and Computers, CA, USA, 2023.
6. Duong T. A. Nguyen*, Jiaming Cheng*, Duong T. Nguyen, Angelia Nedić, **CrowdCache: A Decentralized Game-Theoretic Framework for Mobile Edge Content Sharing**, Proceedings of the 21th IEEE International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt), Singapore, 2023.
7. Jiaming Cheng*, Duong T. A. Nguyen*, Lele Wang, Duong T. Nguyen, Vijay K. Bhargava, **A Bandit Approach to Online Pricing for Heterogeneous Edge Resource Allocation**, Proceedings of the IEEE 9th International Conference on Network Softwarization (NetSoft), Madrid, Spain, 2023 (Acceptance rate: 20-25%).

Submitted papers (Under review)

1. Jiaming Cheng, Duong T. A. Nguyen, Duong T. Nguyen, **Robust Dynamic Edge Service Placement Under Spatio-Temporal Correlated Demand Uncertainty**. (Submitted to IEEE Journal on Selected Areas in Communications)
2. Duong T. A. Nguyen, Duong T. Nguyen, Angelia Nedić, **Distributed Stochastic Optimization with Gradient Tracking, Acceleration and Uncoordinated Step-Sizes over Time-Varying Directed Networks**. (Submitted to IEEE Transactions on Signal Processing)
3. Duong T. A. Nguyen, Tarannum Nisha, Ni Trieu, Duong T. Nguyen, **A Mixed-Integer Bi-level Model for Joint Optimal Edge Resource Pricing and Service Placement**. (Submitted to IEEE Transactions on Networking)
4. Jiaming Cheng*, Duong T. A. Nguyen*, Ni Trieu, Duong T. Nguyen, **Delay-Aware Robust Edge Network Hardening Under Decision-Dependent Uncertainty**. (Submitted to IEEE Transactions on Networking)
5. Duong T. A. Nguyen, Duong T. Nguyen, Angelia Nedić, **Distributed Nash Equilibrium Seeking over Time-Varying Directed Communication Networks**, preprint arXiv:2201.02323.

Presentations

1. International Conference on Computing, Networking and Communication (ICNC), **Optimal Workload Allocation for Distributed Edge Clouds With Renewable Energy and Battery Storage**, HI, USA, 2024.
2. 2023 INFORMS Annual Meeting, **A Fairness-Aware Attacker-Defender Model for Optimal Edge Network Operation and Protection**, Phoenix, AZ, October 2023.
3. International Conference on Continuous Optimization (ICCOPT), **Distributed Nash Equilibrium Seeking over Time-Varying Directed Communication Networks**, Bethlehem, PA, July 2022.
4. 2021 INFORMS Annual Meeting, **Market-based Mechanisms For Fair And Efficient Resource Allocation In Edge Computing**, Anaheim, CA, October 2021.
5. LA/MS Sectional Meeting of the Mathematical Association of America, **A Comparative Study of Physics-Informed Deep Learning Models for Discovering Partial Differential Equations**, Loyola University, New Orleans, LA, February 2020.

6. Annual Graduate Student Symposium, **Stable and Accurate Algorithms for Generalized Kirchhoff-Love Plates**, University of Louisiana at Lafayette, Lafayette, LA, November 2019.
7. AMS Sectional Meeting, **Stable and Accurate Algorithms for Generalized Kirchhoff-Love Plates**, University of California, Riverside, Riverside, CA, November 2019.

Posters

1. 45th Annual New York State Regional Graduate Mathematics Conference, **Stable and Accurate Algorithms for generalized Kirchhoff-Love plates**, Syracuse University, Syracuse, NY, March 2020 (remote due to COVID-19).
2. SIAM Texas–Louisiana Annual Meeting, **A Stable and Accurate algorithm for a generalized Kirchhoff-Love plate model**, Southern Methodist University, Dallas, TX, November 2019.

Workshops and Summer Schools

- Foundations and Frontiers of Probabilistic Proofs, ETH, Zurich, Switzerland, July 26, 2021 to August 06, 2021.
- Scientific Computing Around Louisiana (SCALA), Louisiana State University, Baton Rouge, LA, February 2020.
- SIAM Texas–Louisiana Annual Meeting, Southern Methodist University, Dallas, TX, November 2019.
- AWM Research Symposium, Rice University, Houston, TX, April 2019.
- Louisiana Chapter of the ASA - Fall 2018 Meeting, Louisiana State University, Baton Rouge, LA, November 2018.
- VIASM Mathematics Summer School, Quy Nhon University, Quy Nhon, Vietnam, July 2015.

Honors and Awards

- Outstanding Research Award, Arizona State University, Spring 2022.
- Engineering Graduate Fellowship, Ira A. Fulton Schools of Engineering, Arizona State University, Spring 2021.
- Academic Excellence (GPA: 4.0/4.0), University of Louisiana at Lafayette, 2019, 2020.
- Travel Award, Annual New York State Regional Graduate Mathematics Conference, Syracuse University, NY, 2020.
- Finalists of the Three Minutes Thesis Competition, University of Louisiana at Lafayette, Lafayette, LA, 2019.
- Best Posters Award, SIAM Texas–Louisiana Annual Meeting, Southern Methodist University, Dallas, TX, 2019.
- SIAM TX-LA Travel Award, Southern Methodist University, Dallas, TX, November 2019.
- Outstanding Graduate Award (GPA: 3.89/4.0), Dalat University, Vietnam, June 2017.
- Scholarship of the Key National Program on Development in Mathematics, Vietnam Institute for Advanced Study in Mathematics, Vietnam, 2015, 2016, 2017.

Teaching Experience

Arizona State University — School of Computing and Augmented Intelligence
Teaching Assistant — *Tempe, Arizona*

- Fall 2022, Fall 2023: CSE 539 Applied Cryptography (TA)

University of Louisiana at Lafayette — Department of Mathematics
Teaching Assistant — *Lafayette, Louisiana*

- Fall 2018: MATH 103/104 College Algebra (Instructor)
- Spring 2018: STAT 214 Elementary Statistics (TA)
- Fall 2017: STAT 214 Elementary Statistics (TA)

Computer Skills

MATLAB, Python, R, C#, SQL, Julia, SAS, CVX, Gurobi, Mosek, FICO Xpress

Professional Services

IEEE Transactions on Automatic Control (Reviewer)

IEEE Transactions on Control of Network Systems (Reviewer)

IEEE Transactions on Signal Processing (Reviewer)

IEEE Control Systems Letters (Reviewer)

IEEE Networking Letters (Reviewer)

IEEE Conference on Decision and Control (Reviewer)

American Control Conference (Reviewer)