Muhammad Qasim Elahi

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https://qasimelahi.github.io/QasimElahi/

Experience

Graduate Research/Teaching Assistant 2022 – present
School of Electrical and Computer Engineering, Purdue University Indiana, USA

- Conduct research on causal inference, causal discovery, causal bandits, and causal reinforcement learning, with a focus on information-efficient decision making under uncertainty.
- Develop algorithms, theoretical analyses, and Python-based experimental pipelines for evaluating bandit and reinforcement learning methods.

Graduate Research/Teaching Assistant 2020 – 2022
College of Engineering, American University of Sharjah Sharjah, UAE

- Worked on control and modeling of Li-ion batteries and electric vehicle traction systems.
- Assisted students with laboratory experiments, course projects, and grading.

Education

School of Electrical and Computer Engineering, Purdue University Indiana, USA
Ph.D. in Electrical and Computer Engineering 2022 – 2026 *(expected)*

- Advisors: Prof. Murat Kocaoglu & Prof. Mahsa Ghasemi.
- Research area: Causal Inference and Reinforcement Learning.
- CGPA: 4.00/4.00.

American University of Sharjah Sharjah, UAE
Master of Science in Electrical Engineering 2020 – 2022

- Thesis: MRAC-Based Electric Vehicle Energy Management.
- CGPA: 4.00/4.00.

University of Engineering and Technology (UET), Lahore Lahore, Pakistan
Bachelor of Science in Electrical Engineering 2015 – 2019

- Senior Design Project: Single Input Multiple Output (SIMO) smart antenna system.
- CGPA: 3.91/4.00; class rank: 5/160.

Research Interests

- Causal Bandits and Causal Reinforcement Learning.
- Causal Inference, Causal Discovery, and Online Experimental Design.
- Information-Efficient Decision Making, Bayesian Learning, and Regret Analysis.

Skills

- Programming Languages: Python, R, MATLAB, SQL, C/C++, Bash.
- Machine Learning & Causal Inference: PyTorch, PyAgrum, structural causal models, causal discovery, bandit algorithms, reinforcement learning.
- Optimization & Algorithms: Convex optimization, stochastic optimization, dynamic programming, combinatorial algorithms, regret analysis.
- Data Analysis & Visualization: NumPy, Pandas, Matplotlib, Seaborn, Plotly.
- Languages: English, Urdu, Punjabi.

Publications AI & Machine Learning

1. **Muhammad Qasim Elahi**, Mahsa Ghasemi, and Murat Kocaoglu, "Identification of Average Outcome under Interventions in Confounded Additive Noise Models," to appear in **Transactions on Machine Learning Research** (**TMLR**).
2. Zihan Zhou*, **Muhammad Qasim Elahi***, and Murat Kocaoglu, "Characterization and Learning of Causal Graphs from Hard Interventions," to appear in **Advances in Neural Information Processing Systems** (**NeurIPS**), San Diego, USA, December 2025.
(* means Equal Contribution)

3. **Muhammad Qasim Elahi***, Somtochukwu Oguchienti*, Maheed H. Ahmed, and Mahsa Ghasemi, "Reinforcement Learning from Multi-level and Episodic Human Feedback," **Proceedings of the 7th Annual Learning for Dynamics & Control Conference (L4DC)**, University of Michigan, Ann Arbor, USA, June 2025.
(* means Equal Contribution)

4. **Muhammad Qasim Elahi**, Mahsa Ghasemi, and Murat Kocaoglu, "Partial Structure Discovery is Sufficient for No-regret Learning in Causal Bandits," **Advances in Neural Information Processing Systems (NeurIPS)**, Vancouver, Canada, December 2024.

5. Zihan Zhou*, **Muhammad Qasim Elahi***, and Murat Kocaoglu, "Sample Efficient Bayesian Learning of Causal Graphs from Interventions," **Advances in Neural Information Processing Systems (NeurIPS)**, Vancouver, Canada, December 2024.
(* means Equal Contribution)

6. **Muhammad Qasim Elahi***, Lai Wei*, Murat Kocaoglu, and Mahsa Ghasemi, "Adaptive Online Experimental Design for Causal Discovery," **International Conference on Machine Learning (ICML) Spotlight, top 3.5% of 9473 submissions**, Vienna, Austria, July 2024.
(* means Equal Contribution)

7. Lai Wei, **Muhammad Qasim Elahi**, Mahsa Ghasemi, and Murat Kocaoglu, "Approximate Allocation Matching for Structural Causal Bandits with Unobserved Confounders," **Advances in Neural Information Processing Systems (NeurIPS)**, New Orleans, USA, December 2023.

Other Publications

1. Faris AtaAllah, Mazen Elsaadany, **Muhammad Qasim Elahi**, Shayok Mukhopadhyay, and Habib-ur Rehman, "Nested FOPI and PI Controller Performance Comparison for Electric Vehicle Traction System," **IEEE Access**, 2025.

2. Mazen Elsaadany, **Muhammad Qasim Elahi**, Faris Ata, Habib-Ur-Rehman, and Shayok Mukhopadhyay, "Comparative Analysis of Different FOPI Approximations and Number of Terms Used on Simulations of a Battery-Powered, Field-Oriented Induction Motor Based Electric Vehicle Traction System," **Frontiers in Control Engineering: Control and Automation Systems**, 2022.

3. **Muhammad Qasim Elahi**, Mazen Elsaadany, Habib-Ur-Rehman, and Shayok Mukhopadhyay, "Battery Energy Consumption Optimization for the EV Traction System," **International Conference on Compatibility, Power Electronics and Power Engineering**, 2022.

Workshop Publications

1. **Muhammad Qasim Elahi**, Mahsa Ghasemi, and Murat Kocaoglu, "Identification of Average Treatment Effects in Confounded Additive Noise Models," **IROS 2023 Workshop on Causality for Robotics**.

2. **Muhammad Qasim Elahi**, Mahsa Ghasemi, and Murat Kocaoglu, "Partial Structure Discovery is Sufficient for No-regret Learning in Causal Bandits," **ICML 2024 Workshop: Foundations of Reinforcement Learning and Control – Connections and Perspectives**.

Previous Projects

- Smart energy management and control of electric vehicle traction systems.
- DC motor position control system design and hardware implementation.
- Time table management system website using PHP and MySQL.
- Speaker identification using Mel-frequency cepstral coefficients (MFCC).
- Facial pose detection from black-and-white facial images using neural networks.
- Software-defined FM radio implementation in MATLAB.
- Self-balancing two-wheeled robot using PID control.
- Active bandpass filter implementation using operational amplifiers.

Reviewer For

- ICML 2026
- UAI 2026
- AISTATS 2025
- NeurIPS 2025
- ICML 2025
- ICLR 2024
- NeurIPS 2024
- UAI 2024
- IEEE CDC 2023
- AISTATS 2023

Awards & Recognitions

- Bilsland Dissertation Fellowship, Purdue University Graduate School, 2026–2027.
- Gold Reviewer, ICML 2026: recognized among the top 25% of reviewers.
- Student Travel Grant, NeurIPS 2025.
- Student Travel Grant, NeurIPS 2023.
- Academic Excellence Award, College of Engineering Annual Awards 2023, American University of Sharjah, UAE.
- Dr. P. Carter Speers Medal for First Position in Intermediate Pre-Engineering, Forman Christian College, Lahore.

Teaching Assistant

American University of Sharjah — Sharjah, UAE
Department of Electrical Engineering — 2020 – 2022

- ELE 225: Electric Circuits and Devices.
- ELE 352: Electric Machines.
- ELE 353: Control Systems.
- ELE 485: Power Electronics.
- MTR 670: Adaptive Control Systems.

Purdue University — Indiana, USA
School of Electrical and Computer Engineering — 2024 – present

- ECE 20875: Python for Data Science.
- ECE 59500: Reinforcement Learning – Theory & Algorithms.

References

Dr. Murat Kocaoglu, Assistant Professor, Johns Hopkins University.

- Relationship: Ph.D. co-advisor.
- Email: mkocaoglu@purdue.edu.

Dr. Mahsa Ghasemi, Assistant Professor, Purdue University.

- Relationship: Ph.D. co-advisor.
- Email: mahsa@purdue.edu.

Dr. Habib-Ur-Rehman, Professor, American University of Sharjah.

- Relationship: M.Sc. co-advisor.
- Email: rhabib@aus.edu.

Dr. Asim Loan, Professor, University of Engineering and Technology, Lahore.

- Relationship: Course Instructor.
- Email: aloan@uet.edu.pk.