

Arwa Alanqary

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EDUCATION	Ph.D. Electrical Engineering and Computer Science , UC Berkeley	2021-present
	Advisor: Alexandre Bayen Areas of Research: Control Theory, Multi-agent Systems, Machine Learning, Algorithmic Game Theory. GPA: 4.0 / 4.0	
	M.Sc. Computational Science and Engineering , MIT	2019-2021
	Thesis advisor: Devavrat Shah Areas of Research: Machine Learning, Statistics, Time Series Analysis. GPA: 5.0 / 5.0	
	B.S. Mechanical Engineering , Alfaisal University	2013-2017
	GPA: 4.0 / 4.0 (Class valedictorian)	
RESEARCH EXPERIENCE	Research Assistant , Berkeley AI Research Lab (BAIR) and CITRIS, UC Berkeley	2021–Present
	Berkeley, CA Supervised by Alexandre Bayen	
	- Developed game-theoretic models to design incentive mechanisms that promote fairness, preserve privacy, and enhance efficiency in congestion games, with applications to congestion pricing in selfish routing models. - Designed online learning algorithms for inferring unknown user payoffs in multi-agent environments through repeated recommendations, with applications to routing and navigation platforms.	
	Research Assistant , CIRCLES research consortium	2021–2023
	Supervised by Alexandre Bayen (UC Berkeley) and Benedetto Piccoli (Rutgers University)	
	- Developed algorithms for traffic flow control using connected and automated vehicles (CAVs). - Demonstrated in simulation the efficacy of this control paradigm in improving the efficiency and stability of longitudinal traffic flow. - Deployed and tested the controllers in a large-scale field experiments, demonstrating that a small penetration rate of autonomous vehicles can significantly enhance overall traffic dynamics. - Performed trajectory-based data analysis to empirically substantiate the performance gains of the control framework.	
	Research Assistant , Laboratory for Information and Decision Systems (LIDS) at MIT	2019–2021
	Cambridge, MA Supervised by Devavrat Shah	
	- Developed algorithms for multivariate time series analysis including the tasks of forecasting, imputation, and change point detection. - Leveraged the low-rank structure of time series data to develop these algorithms based on singular spectrum analysis tools and establish theoretical performance guarantees. - Worked with industry partners in the financial sector to implement our algorithm in real-world setting.	
	Research Assistant , Computational Cognitive Science (CoCoSci) Lab at MIT	2020–2021
	Cambridge, MA Supervised by Joshua Tenenbaum	
	Worked on probabilistic modeling and inference of human behavior with a focus on Bayesian theory of mind (BToM).	

INDUSTRY	Applied Scientist Intern , Amazon Web Services	May–August, 2025
RESEARCH	Seattle, WA	
EXPERIENCE	Supervised by Fabien Chraim and Marina Thottan - Developed and deployed a spatio-temporal graph neural network (GNN) model to forecast congestion risk events from multivariate network utilization time-series data. - Validated the model on AWS’s backbone network infrastructure, demonstrating production-grade performance and real-world scalability.	
	Student Researcher , Google Research	June–December, 2024
	Mountain View, CA	
	Supervised by Shoshana Vasserman, Carolina Osorio, and Chao Zhang - Implemented a simulation-based optimization algorithm for origin-destination demand estimation in large-scale networks from trajectory data. - Developed a novel regularization approach to improve the accuracy of demand estimation. - Developed a scalable equilibrium analysis solver to evaluate congestion pricing strategies and assess induced demand effects across various traffic networks.	
SELECTED PUBLICATIONS	[1] Arwa Alanqary, Zakaria Baba, Manxi Wu, Alexandre M Bayen. Learning to Recommend in Unknown Games. <i>Preprint</i>, 2026 [2] Pan-Yang Su, Arwa Alanqary, Bryce L. Ferguson, Manxi Wu, Alexandre M. Bayen, Shankar Sastry. Average Unfairness in Routing Games. <i>International Conference on Autonomous Agents and Multiagent Systems (AAMAS)</i>, 2026 [3] Arwa Alanqary, Chao Zhang, Yechen Li, Neha Arora, Carolina Osorio. Improving simulation-based origin-destination demand calibration using sample segment counts data. <i>Triennial Symposium on Transportation Analysis conference (TRISTAN)</i>, 2025 [4] Jonathan W Lee, Han Wang, Kathy Jang, Nathan Lichtlé, Amaury Hayat, Matthew Bunting, Arwa Alanqary, et al. Traffic control via connected and automated vehicles (CAVs): An open-road field experiment with 100 CAVs. <i>IEEE Control Systems</i>, 2025 [5] Amaury Hayat, Arwa Alanqary, Rahul Bhadani, et al. Traffic smoothing using explicit local controllers. <i>IEEE Control Systems</i>, 2025 [6] Arwa Alanqary, Abdul Rahman Kreidieh, Samitha Samaranayake, Alexandre Bayen. Improving Social Cost in Traffic Routing with Bounded Regret via Second-Best Tolls. <i>63rd IEEE Conference on Decision and Control (CDC)</i>, 2024 [7] Zhe Fu, Arwa Alanqary, Abdul Rahman Kreidieh, and Alexandre M Bayen. Kernel-based planning and imitation learning control for flow smoothing in mixed autonomy traffic. <i>Transportation Research Part C: Emerging Technologies</i>, 2024 [8] Arwa Alanqary, Xiaoqian Gong, Alexander Keimer, Benjamin Seibold, Benedetto Piccoli, Alexandre Bayen. Optimal Control of Autonomous Vehicles for Flow Smoothing in Mixed Autonomy Traffic <i>62nd IEEE Conference on Decision and Control (CDC)</i>, 2023 [9] Arwa Alanqary, Abdullah Alomar, Devavrat Shah. Change Point Detection via Multivariate Singular Spectrum Analysis. <i>Advances in Neural Information Processing Systems (NeurIPS)</i> 34, 2021 [10] Arwa Alanqary, Gloria Z. Lin, Joie Le, Tan Zhi-Xuan, Vikash K. Mansinghka, Joshua B. Tenenbaum. Modeling the Mistakes of Boundedly Rational Agents Within a Bayesian Theory of Mind. <i>Annual Conference of the Cognitive Science Society (CogSci)</i>, 2021 (Oral Presentation)	