

## Education

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### Academic Qualifications

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- **University of Pennsylvania** **Philadelphia**  
*Ph.D. Computer and Information Science, GPA: 3.81/4* *Jan.2021--Present*  
Coursework: Computer Organization and Design, Theory of Computation
- **Duke University** **Durham**  
*M.S. Economics & Computation, GPA: 3.96/4* *Sept.2018--May 2020*  
Coursework: Computational Economics, Design and Analysis Algorithms, Artificial Intelligence, Ph.D. Econometrics I, II, Machine Learning, Econometrics of Market Design, Distributed System
- **Wuhan University** **Wuhan**  
*Bachelor of Economics, GPA: 3.89/4* *Sept.2014--May 2018*  
Coursework: Calculus, Real Analysis, Linear Algebra, Ordinary Differential Equation, Dynamic Optimization, Probability Theory & Statistics, Stochastic Processes, Time Series, Mathematical Modeling

## Research

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- **Carbon Responder: Coordinating Demand Response for the Datacenter Fleet**  
*May 2022 - Present*  
With Bilge Acun, Aditya Sundarrajan, David Brooks, Manoj Chakkaravarthy, Nikky Avila, Carole-Jean Wu, and Benjamin C. Lee.  
Collaborated on designing the Carbon Responder to mitigate carbon emissions in datacenters by modulating computational loads based on the marginal carbon intensity of the power supply. Targeted both online and batch processing workloads and developed fair strategies for distributing demand response curtailments across different workloads. Highlighted the realistic trade-offs between carbon footprint reduction and performance, reset expectations and offered more grounded assessments of demand response potential in modern, hyperscale datacenters.
- **Charon: A Framework for Microservice Overload Control**  
*Mar. 2021 - Present*  
With Akis Giannoukos, Henri Maxime Demoulin, Konstantinos Kallas, and Benjamin C. Lee.  
Co-developed Charon, a novel distributed framework for microservice overload control that improves performance and scalability. Utilized a token-based market system for resource allocation and innovative price propagation techniques. Demonstrated the benefits against traditional overload control policies. The workshop version available at [HotNets21](#).

- **Fair Allocation for Complementary and Substitutable System Resources**  
*May 2019 - Nov. 2021*  
 With Benjamin C. Lee.  
 Proposed and detailed a framework for the allocation of complementary and substitutable microarchitectural resources such as cores, memory bandwidth, and L2 cache sizes. Utilized the nested constant elasticity of substitution utility function to ensure sharing incentives and Pareto efficiency. Benchmarked our approach against conventional baselines using parameters profiled from gem5 experiments.
- **Does Centralized Corruption Reduce Bribes?**  
*Aug. 2018 - Jan. 2019*  
 Employed Stochastic Frontier Analysis to evaluate the impact of centralized bureaucracy on corruption levels. Controlled for heteroskedasticity, spatial autocorrelation, and robustness. Concluded that while centralized governance does not reduce the base level of bribery (the bribe frontier), it does significantly lower overall bribe amounts by decreasing inefficiencies in bribe transactions. Full paper available [here](#).

## External Collaboration

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- **SysML Group at FAIR, Meta Inc.** **Meta, Menlo Park, CA**  
*Summer Research Internship* *May.2022--Dec.2022*  
 Refined and expanded the analysis of the [Carbon Explorer](#) project. Collaborated with various teams to assess datacenter power demand elasticity and delay tolerance in real-world scenarios. Enhanced the project by developing a multi-workload, carbon-aware demand response mechanism, integrating diverse data and computational workloads.
- **Raytheon Technologies and William & Mary** **Durham, NC**  
*Research Collaboration* *Jun.2020--Mar.2021*  
 In collaboration with David Fischer, Nitya Labh, Ryan Piersma, Benjamin C. Lee, Yu Amy Xia, Tuhin Sahai, and Vahid Tarokh, contributed to the development of a simulation framework for permissioned blockchains, with applications in logistics and other domains. Full paper available [here](#).

## Teaching Assistant Experience

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- **Algorithmic Game Theory** **Philadelphia, PA**  
*Teaching Assistant for Dr. Aaron Roth, University of Pennsylvania* *Spring 2022*  
 Graded coursework and examinations, and held weekly office hours.
- **Artificial Intelligence** **Durham, NC**  
*Teaching Assistant for Dr. Ron Parr, Duke University* *Fall 2020*  
 Designed assessments, led office hours, managed Piazza discussions, and graded assignments.
- **Computational Microeconomics** **Durham, NC**  
*Teaching Assistant for Dr. Vincent Conitzer, Duke University* *Spring 2020*  
 Taught recitations, oversaw course tools (forums, Gradescope), and provided grading support.
- **Machine Learning** **Durham, NC**  
*Teaching Assistant for Dr. Cynthia Rudin, Duke University* *Fall 2019*  
 Coordinated a Kaggle competition, acted as course webmaster, and assisted in grading and exams.

## Technical Skills

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- **Programming Languages:** Golang, Python, Unix Shell, C++,  $\text{\LaTeX}$ , R, Matlab, Java.  
Also basic ability with: GNU MathProg, MySQL, Lingo, Stata.
- **Miscellaneous Skills:** **gem5**, Web Scraping, System Administration, Network Security.

## Interests and extra-curricular activity

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- Game Theory, Social Choice, Causal Inference, Fair Division, and Mechanism Design.
- Political Economics, Internet Privacy and Cybersecurity.
- History, Linguistics, Sociology.
- Badminton, Archery.