Vincent Leon

PhD Candidate in Industrial Engineering · University of Illinois Urbana-Champaign

1308 W Main St, CSL Building Rm 125, Urbana, IL 61801, USA

leon18@illinois.edu | vin-leon.github.io | vin-leon

Research Interests

My research spans **game theory**, **online learning**, **social networks**, and **optimal control**. My doctoral dissertation focuses on equilibrium analysis of dynamic games, learning algorithm design for multi-agent systems, mechanism design, and online control in networks, drawing on game theory, optimization, multi-armed bandits and reinforcement learning, with a focus on strategic resource allocation. I am also broadly interested in distributed systems, networked control, inverse game theory, robust and resilient algorithm design, and applications in cyber security, data privacy, traffic routing, and wireless communication.

Education

University of Illinois Urbana-Champaign *Urbana, IL, USA*

PhD in Industrial Engineering (In Progress) *expected May 2026*

- Advisor: Assoc. Prof. S. Rasoul Etesami
- Dissertation Topic: Online learning in dynamic games and social networks
- Prelim Exam Committee: Assoc. Prof. S. Rasoul Etesami (Chair), Prof. Carolyn L. Beck, Assoc. Prof. Subhonmesh Bose, Prof. Rakesh Nagi, Prof. Jeff S. Shamma
- GPA: 3.96/4.00

The University of Hong Kong *Hong Kong*

BEng in Civil Engineering (First Class Honours) *2016*

- GPA: 3.76/4.30

University of Illinois Urbana-Champaign *Urbana, IL, USA*

Engineering Non-degree Exchange Program *Aug 2014 – May 2015*

- GPA: 3.95/4.00

Professional Experience

Singapore University of Technology and Design *Singapore*

Visiting Scholar *Aug 2024–Jan 2025*

- Supervisor: Asst. Prof. Antonios Varvitsiotis
- Research: Polynomial optimization techniques for concave, monotone, and extensive-form games

Ove Arup & Partners HK Ltd. *Hong Kong*

Assistant Engineer *Aug 2016–Aug 2019*

Publications

Journal Articles

V. Leon and S. R. Etesami, "Online learning in budget-constrained dynamic Colonel Blotto games," *Dynamic Games and Applications*, vol. 14, pp. 865–887, 2024. doi: 10.1007/s13235-023-00518-7.

V. Leon, S. R. Etesami, and R. Nagi, "Limited-trust in diffusion of competing alternatives over social networks," *IEEE Transactions on Network Science and Engineering*, vol. 11, no. 1, pp. 1320–1336, 2024, doi: 10.1109/TNSE.2023.3322132.

S. R. Etesami, N. Kiyavash, **V. Leon**, and H. V. Poor, "Optimal adversarial policies in the multiplicative learning system with a malicious expert," *IEEE Transactions on Information Forensics and Security*, vol. 16, pp. 2276–2287, 2021, doi: 10.1109/TIFS.2021.3052360.

Conference Articles

V. Leon, I. Sakos, R. Sim, and A. Varvitsiotis, "Certifying concavity and monotonicity in games via sum-of-squares hierarchies", accepted to *NeurIPS 2025*, San Diego, CA, USA & Mexico City, Mexico, 2025.

V. Leon and S. R. Etesami, "Online reinforcement learning in Markov decision process using linear programming," in *2023 62nd IEEE Conference on Decision and Control (CDC)*, Singapore, 2023, pp. 1973–1978, doi: 10.1109/CDC49753.2023.10383839.

V. Leon, S. R. Etesami, and R. Nagi, "Diffusion of innovation under limited-trust equilibrium," in *2022 IEEE 61st Conference on Decision and Control (CDC)*, Cancun, Mexico, 2022, pp. 3145–3150, doi: 10.1109/CDC51059.2022.9992669.

V. Leon and S. R. Etesami, "Bandit learning for dynamic Colonel Blotto game with a budget constraint," in *2021 60th IEEE Conference on Decision and Control (CDC)*, Austin, TX, USA, 2021, pp. 3818–3823, doi: 10.1109/CDC45484.2021.9683087.

Preprints

V. Leon and S. R. Etesami, "Online learning for dynamic Vickrey-Clarke-Groves mechanism in unknown environments", *arXiv Preprint (submitted to Automatica)*, arXiv:2506.19038, 2025.

In Preparation

V. Leon and S. R. Etesami, "Online optimal control for contagion prevention in financial networks", *In Preparation*.

Presentations

Invited Talks

December 2023. **Limited-trust in diffusion of competing alternatives over social networks.** ESD Research Seminar, Singapore University of Technology and Design, Singapore.

Contributed Presentations

October 2025. **Online learning for dynamic Vickrey-Clarke-Groves mechanism in sequential auctions under unknown environments (oral presentation).** The 2025 INFORMS Annual Meeting (Job Market Showcase Track), Atlanta, GA, USA.

May 2025. **Online learning for dynamic Vickrey-Clarke-Groves mechanism in sequential auctions under unknown environments (oral and poster presentations).** The 2nd Annual ISE Student Conference, University of Illinois Urbana-Champaign, Urbana, IL, USA.

April 2025. **Online learning for dynamic Vickrey-Clarke-Groves mechanism in sequential auctions under unknown environments (poster presentation).** The 11th Midwest Workshop on Control and Game Theory, University of Illinois Urbana-Champaign, Urbana, IL, USA.

April 2024. **Online learning in budget-constrained dynamic Colonel Blotto games (oral and poster presentations).** The Inaugural ISE Student Conference, University of Illinois Urbana-Champaign, Urbana, IL, USA.

December 2023. **Online reinforcement learning in Markov decision process using linear programming (oral presentation).** IEEE CDC 2023, Singapore.

December 2022. **Diffusion of innovation under limited-trust equilibrium (oral presentation).** IEEE CDC 2022, Cancún, México.

October 2022. **Online learning in budget-constrained dynamic Colonel Blotto games (poster presentation).** C3.ai DTI Workshop on Data, Learning, and Markets, University of Illinois Urbana-Champaign, Urbana, IL, USA.

December 2021. **Bandit learning for dynamic Colonel Blotto game with a budget constraint (oral presentation).** IEEE CDC 2021 (virtual), Austin, TX, USA.

Teaching Experience

University of Illinois Urbana-Champaign

Graduate Teaching Assistant

- IE 521 - Convex Optimization *Fall 2025*
- IE 310 - Deterministic Models in Optimization, a.k.a. Intro to Operations Research *Spring 2025, Spring 2022*
- IE 529 - Statistics of Big Data and Clustering *Spring 2024*
- IE 511 - Integer Programming *Spring 2023*
- SE 320 - Control Systems (Lab instructor & TA) *Fall 2022, Fall 2021*
- SE 100 - Introduction to ISE *Fall 2020*

Awards and Scholarships

2025 **NeurIPS 2025 Financial Assistance Award**, NeurIPS
ISE Conference Funding and Conference Presentation Award, ISE, UIUC

2024 **The Inaugural ISE Student Conference Outstanding Poster Award**, ISE, UIUC

2023 **IEEE Control Systems Society (CSS) Student Travel & Workshop Support**, IEEE CSS
ISE Conference Funding and Conference Presentation Award, ISE, UIUC

2016 **Best Final Year Project Award**, American Society of Civil Engineers (Hong Kong Section)
Chu Yuk Baw Prize in Civil Engineering, The University of Hong Kong
Dean's Honours List, The University of Hong Kong

2015 **Hui Yin Hing Scholarship**, The University of Hong Kong
Lee Shau Kee Scholarship, The University of Hong Kong

2013, 2014 **Dean's Honours List**, The University of Hong Kong

Professional Services & Extra-curricular Activities

Journal & Conference Reviewer

Journal IEEE Transactions on Automatic Control
IEEE Transactions on Control of Network Systems
Knowledge and Information Systems

Conference IEEE CDC (2023, 2024, 2025)
NeurIPS (2025-subreviewer)

Extra-curricular Activities

- Secretary, Dancing Illini, University of Illinois Urbana-Champaign *2025–present*

Relevant Coursework

Decision and Control: Control system theory and design (ECE 515), MDPs and reinforcement learning (ECE 586)
Optimization: Approximation algorithms (CS 583), combinatorial optimization (IE 519), game theory (IE 598), linear & integer programming (IE 411 & 511), optimization under uncertainty (IE 598)
Learning theory & AI: Machine learning (ECE 449), statistical learning theory (ECE 543)

Languages & Skills

Programming Python and LaTeX: proficient
Julia, MATLAB, and Java: intermediate

Languages Chinese (Mandarin): native proficiency
Chinese (Cantonese): native-like proficiency
English: full professional proficiency (C1–C2)
Spanish: professional working proficiency (B2–C1)
French: elementary proficiency (A2–B1)