

Phebe Vayanos

Andrew and Erna Viterbi Early Career Chair in Engineering
Associate Professor of Industrial & Systems Engineering and Computer Science
Co-Director, USC Center for AI in Society
Viterbi School of Engineering, University of Southern California

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Office OHE310L

RESEARCH INTERESTS Operations Research & Artificial Intelligence: robust optimization, integer optimization, and stochastic programming and their interface with machine learning, causal inference, and economics to enable the design of predictive and prescriptive models that are suitable to deploy in high-stakes settings (robust, interpretable, fair); their applications to tackle pressing societal problems (e.g., housing and organ allocation, suicide and substance use prevention, and conservation)

ACADEMIC APPOINTMENTS

University of Washington, Seattle, WA **2023-present**
Michael G. Foster School of Business
Visiting Scholar since Oct. 2023

University of Southern California, Los Angeles, CA **2015-present**
Viterbi School of Engineering
Andrew and Erna Viterbi Early Career Chair in Engineering since 2023
Associate Professor of Industrial & Systems Engineering and Computer Science since 2023
WiSE Gabilan Assistant Professor 2021-2023
Assistant Professor of Industrial & Systems Engineering and Computer Science 2017-2023
Assistant Professor of Industrial & Systems Engineering 2015-2017

CAIS Center for AI in Society
Co-Director since 2023
Associate Director 2016-2023

MIT Sloan School of Management, Cambridge, MA **2013-2015**
Operations Research & Statistics Group
Lecturer in Operations Research and Statistics 2014-2015

Operations Research Center
Postdoctoral Associate 2013-2015
• Advisor: Dimitris Bertsimas

Massachusetts Institute of Technology, Cambridge, MA **2012-2013**
Department of Chemical Engineering
Postdoctoral Associate
• Advisor: Paul I. Barton

EDUCATION

Imperial College London, London, UK*Department of Computing***2008-2012**

Ph.D., Operations Research

- Advisors: Daniel Kuhn and Berg Rustem

*Department of Electrical and Electronic Engineering***2002-2007**

M.Eng., Electrical and Electronic Engineering (with year in industry)

- First Class Honors, Thesis title: “A novel method for online signal modality characterization”
- Advisor: Danilo Mandic

PHD THESIS

“Decision rule approximations for dynamic optimization under uncertainty,” Imperial College, 2013.

AWARDS AND HONORS

Associate Editor for *Operations Research* “Optimization” area **Jan. 2024-Dec. 2026**Associate Editor for *Operations Research* “Real World OR Innovations” **Jan. 2024-Dec. 2026**

- This area will be dedicated to the publication of high-quality research that exemplifies the practical impact achieved through innovative applications of OR methods

Imperial College Emerging Alumni Leader Award **2024**

- This award recognises and celebrates rising stars, innovators, game-changers and future leaders that have graduated from Imperial College London in the last 15 years

Attendee at TIME100 Impact Dinner, San Francisco **2023**

- Event in honor of ‘Extraordinary Women Shaping The Future Of A.I.’
- Co-hosted by Jessica Sibley, Chief Executive Officer of TIME, and Campbell Brown, Meta’s VP of Media Partnerships

Appointed to a Viterbi Early Career Chair in Engineering **2023-2028**

- Held 2023-2028 or until promotion to full professor

Chair (elected) of the Committee on Stochastic Programming (COSP) **2023-2025**

- COSP is the governing body of the Stochastic Programming Society (SPS)

Speaker at TED AI 2023 Event, San Francisco **2023**

- A TED event with focus on the power and impact of AI
- See here for the talk: https://www.ted.com/talks/phebe_vayanos_ai_could_increase_equality_if_we_design_it_right

Panelist for panel on ‘Responsible AI’ at TED AI 2023 Event, San Francisco **2023**

- Panel moderated Thomas Goetz; its goal is to explore the essence of Responsible AI and chart the path forward, grasp fairness, transparency, and accountability principles through real-world case studies

Participant at National Academy of Engineering (NAE) Frontiers of Engineering Symposium **2023**

- Grainger Foundation Frontiers of Engineering Symposium

Invited to National Academy of Engineering (NAE) 2022 EU-US Frontiers of Engineering **2022**

- the symposium brings together 100 highly accomplished early-career engineers from US universities, companies, and government to discuss leading-edge research and technical work across a range of engineering fields
- could not accept invitation due to my due date being within two weeks of the event date

USC Viterbi Junior Research Award	2022																				
<ul style="list-style-type: none"> • awarded for significant research accomplishments, including: publications, creation and adoption of intellectual property, research leadership, external research awards, and useful contributions to a problem of national/societal importance 																					
<u>National Science Foundation CAREER award</u>	2021-2026																				
WiSE Gabilan Assistant Professorship	2021-2023																				
<ul style="list-style-type: none"> • distinction that serves to recognize academic excellence • held 2021-2024, or until tenure 																					
INFORMS Public Sector Operations Research (PSOR) Society Officer	2021, 2022																				
<ul style="list-style-type: none"> • VP of Communications 																					
Three “Committee’s Choice” presentations at INFORMS Annual Meeting	2021																				
<ul style="list-style-type: none"> • Talk “Bringing STEM to underserved communities” • Talk “Designing policies for allocating housing to persons experiencing homelessness” • Talk “Designing efficient and equitable housing allocation policies from data collected in deployment” 																					
<u>INFORMS Diversity, Equity, and Inclusion Ambassadors Program Award</u>	2020																				
Zumberge Epidemic & Virus Related Research and Development award	2020																				
Best Paper Award at GameSec	2020																				
<ul style="list-style-type: none"> • Paper “Exploiting bounded rationality in risk-based cyber camouflage games” 																					
Elected Member of the Committee on Stochastic Programming (COSP)	2019-2023																				
<ul style="list-style-type: none"> • COSP is the governing body of the Stochastic Programming Society (SPS) 																					
Zumberge Faculty Research & Innovation award	2018																				
Member of the INFORMS AdHoc AI Strategy Advisory Committee	2019, 2021-present																				
<ul style="list-style-type: none"> • Appointed by the INFORMS President Ramayya Krishnan in 2019 • Reappointed by INFORMS President-elect Radhika Kulkarni in 2021 																					
Outstanding paper at CPAIOR	2018																				
<ul style="list-style-type: none"> • Paper “Designing fair, efficient, and interpretable policies for prioritizing homeless youth for housing resources,” M. J. Azizi, P. Vayanos, B. Wilder, E. Rice and M. Tambe. 																					
AWARDS AND HONORS EARNED BY MY GRADUATE STUDENTS	<table border="0"> <tr> <td>USC Viterbi 2nd Annual 3 Minute Thesis Contest, Finalist, 3rd place</td> <td style="text-align: right;">2023</td> </tr> <tr> <td> <ul style="list-style-type: none"> • Student: Sina Aghaei </td> <td></td> </tr> <tr> <td>Amazon SCOT/INFORMS Scholarship</td> <td style="text-align: right;">2023</td> </tr> <tr> <td> <ul style="list-style-type: none"> • Student: Caroline Johnston </td> <td></td> </tr> <tr> <td>EAAMO 2023 Doctoral Consortium Award</td> <td style="text-align: right;">2023</td> </tr> <tr> <td> <ul style="list-style-type: none"> • Student: Caroline Johnston </td> <td></td> </tr> <tr> <td>Women in OR/MS (WORMS) Doctoral Student Colloquium Award</td> <td style="text-align: right;">2022</td> </tr> <tr> <td> <ul style="list-style-type: none"> • Student: Caroline Johnston </td> <td></td> </tr> <tr> <td>USC CAIS Student Leaders (elected)</td> <td style="text-align: right;">2022-2024</td> </tr> <tr> <td> <ul style="list-style-type: none"> • Student: Nathan Justin </td> <td></td> </tr> </table>	USC Viterbi 2nd Annual 3 Minute Thesis Contest, Finalist, 3rd place	2023	<ul style="list-style-type: none"> • Student: Sina Aghaei 		Amazon SCOT/INFORMS Scholarship	2023	<ul style="list-style-type: none"> • Student: Caroline Johnston 		EAAMO 2023 Doctoral Consortium Award	2023	<ul style="list-style-type: none"> • Student: Caroline Johnston 		Women in OR/MS (WORMS) Doctoral Student Colloquium Award	2022	<ul style="list-style-type: none"> • Student: Caroline Johnston 		USC CAIS Student Leaders (elected)	2022-2024	<ul style="list-style-type: none"> • Student: Nathan Justin 	
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Best Presentation Award at International Conference on Conservation Biology	2022	
<ul style="list-style-type: none"> • Talk “Building biodiversity conservation plans robust to human land use uncertainty” • Student: Yingxiao Ye 		
Viterbi Graduate Student Award, Best RA	2022	
<ul style="list-style-type: none"> • Student: Nathan Justin 		
National Science Foundation (NSF) Graduate Research Fellowship	2021, 2022	
<ul style="list-style-type: none"> • 2 PhD students earned the award in 2022: Nathan Justin, Bill Tang • 1 PhD student earned the award in 2021: Caroline Johnston 		
Bayer Women in OR Scholarship, INFORMS Analytics Society	2021	
<ul style="list-style-type: none"> • Student: Caroline Johnston, 1st place 		
USC CAIS Student Leaders (elected)	2021-2022	
<ul style="list-style-type: none"> • Students: Caroline Johnston and Qing Jin 		
Grace Hopper Celebration Student Scholarship	2021	
<ul style="list-style-type: none"> • Student: Aida Rahmattalabi 		
Bayer Women in OR Scholarship, INFORMS Analytics Society	2020	
<ul style="list-style-type: none"> • Student: Aida Rahmattalabi 		
USC Viterbi Graduate School Fellowship	2020	
<ul style="list-style-type: none"> • student: Nathan Justin 		
USC ISE Daniel J. Epstein Fellowship	2019	
<ul style="list-style-type: none"> • student: Qing Jin 		
USC Viterbi School of Engineering/Graduate School Fellowship	2019	
<ul style="list-style-type: none"> • student: Caroline Johnston 		
USC Viterbi Graduate Student Fellowship	2017	
<ul style="list-style-type: none"> • student: Sina Aghaei 		
AWARDS AND HONORS EARNED BY MY UNDERGRADUATE STUDENTS	INFORMS Undergraduate Scholar Award	2022
	<ul style="list-style-type: none"> • Student: Kathryn Dullerud 	
	USC ISE Undergraduate Research Award	2022
	<ul style="list-style-type: none"> • Student: Christopher Doehring 	
	INFORMS Undergraduate Operations Research Prize Award	2021
	<ul style="list-style-type: none"> • Paper “Learning optimal prescriptive trees from observational data” • Student: Nathan Jo, finalist 	
	USC University-wide Discovery Scholar Prize	2021
<ul style="list-style-type: none"> • includes \$10,000 prize to attend a PhD program • Student: Nathan Jo 		
USC Discovery Scholar distinction	2021	
<ul style="list-style-type: none"> • earned for first authored paper “Learning optimal prescriptive trees from observational data” • Student: Nathan Jo 		

- INFORMS Undergraduate Operations Research Prize Award **2020**
- Paper “Constructing data-driven uncertainty sets for conserving biodiversity via robust optimization”
 - Student: Christopher Doehring, finalist
- Audience Choice Presentation at Viterbi Summer Research Student Showcase **2020**
- Talk “A case study on the performance of housing allocation policies among people experiencing homelessness”
 - Student: Kathryn Dullerud
- USC Provost’s Research Fellowship **Fall 2020, Summer 2021**
- Kathryn Dullerud
- USC Viterbi Fellows Merit Research Assistantship **2018**
- student: Christopher Doehring

Please turn over.

PUBLICATIONS

In the list below, I indicate with:

(★) graduate students co-authors and CAIS summer fellows co-authors that I advise

(★★) graduate students co-authors on whose PhD thesis committee I was

POLICY WHITE PAPERS

- [1] *CESTRRR: Coordinated Entry System Triage Tool Research and Refinement*, E. Rice, N. Milburn, P. Vayanos, J. Rountree, C. Hill, R. Petering, B. Blackwell, R. Santillano, L. Onasch-Vera, H. Winetrobe Nadel, (★) B. Tang, (★) S. Aghaei, H.-T. Hsu, L. Petry, 2023.

JOURNAL PAPERS UNDER REVIEW

- [2] “Learning optimal classification trees robust to distribution shifts,” (★) N. Justin, (★) S. Aghaei, A. Gómez, P. Vayanos. Under review for publication at *Operations Research*, October 2023.
- [3] “Learning optimal and fair policies for online allocation of scarce societal resources from data collected in deployment,” (★) B. Tang, C. Koçyiğit, E. Rice, P. Vayanos. Under review for publication at *Management Science*, July 2023.
- Highlighted as “Committee’s Choice” presentation at INFORMS Annual Meeting 2021
 - Research presented as part of my TED AI 2023 Talk
- [4] “ODTlearn: A package for learning optimal decision trees for prediction and prescription” (★) P. Vossler, (★) S. Aghaei, (★) N. Justin, (★) N. Jo, A. Gómez, P. Vayanos. Revise and resubmit at *Journal of Machine Learning Research*, July 2023.
- [5] “The social support networks of precariously housed youth: An egocentric network analysis.” L. Petry, H. Rhoades, S. Wenzel, B. Henwood, P. Vayanos, L. Onasch-Vera, E. Rice. Under review for publication in *Journal of Youth and Adolescence*, 2023.
- [6] “Learning optimal prescriptive trees from observational data,” (★) N. Jo, (★) S. Aghaei, A. Gómez, P. Vayanos. Under second round of review at *Management Science* (after major revision), June 2023.
- Earned Nathan Jo the USC Discovery Scholar distinction
 - Earned Nathan Jo the USC University-wide Discovery Scholar Prize
 - INFORMS Undergraduate Operations Research Prize Award 2021, Finalist
- [7] “Robust active preference elicitation,” P. Vayanos, (★) Y. Ye, (★) D. McElfresh, J. Dickerson, E. Rice. Under major revision at *Management Science* (second round), July 2022.
- Previous title “Active preference elicitation via adjustable robust optimization”.
 - Research presented as part of my TED AI 2023 Talk
- [8] “Robust optimization with decision-dependent information discovery,” P. Vayanos, A. Georghiou, (★) H. Yu. Under major revision at *Management Science* (third round), May 2023.

JOURNAL PAPERS ACCEPTED OR IN PRINT

- [9] “Strong optimal classification trees,” (★) S. Aghaei, A. Gómez, P. Vayanos. Accepted for publication in *Operations Research*, January 2024.
- Extension to the paper “Learning optimal classification trees: strong max-flow formulations” available on ArXiv
- [10] “ROC++: robust optimization in C++,” P. Vayanos, (★) Q. Jin, G. Elissaios. *INFORMS Journal on Computing* 34(6):2873-2888, May 2022.
- *Featured article*: highlighted on the journal’s website and noted as a featured article

- [11] “A community-partnered approach to social network data collection for a large and partial network,” M. Izenberg, R. Brown, C. Siebert, R. Heinz, (★) A. Rahmattalabi, P. Vayanos. *Field Methods*, 35(2), 2022.
- [12] “Cost-sharing mechanism design for ride-sharing,” (★★) S. Hu, M.M. Dessouky, N.A. Uhan, P. Vayanos. *Transportation Research Part B*, 150:410-434, 2021.
- [13] “Associations between the Vulnerability Index-Service Prioritization Decision Assistance Tool (VI-SPDAT) and housing stability among single adults experiencing homelessness in the U.S.,” L. Petry, H.-T. Hsu, C. Hill, M. Morton, P. Vayanos, E. Rice. *Cityscape*, 23(2), 293-324, 2021.
- [14] “Correlates of housing sustainability among youth placed into permanent supportive housing and rapid re-housing: a survival analysis,” H.-T. Hsu, C. Hill, M. Holguin, L. Petry, (★) D. McElfresh, P. Vayanos, M. Morton, E. Rice. *Journal of Adolescent Health*, 69(4):629-635, 2021.
- [15] “Understanding wait times in rapid rehousing among homeless youth: a competing risk survival analysis,” (★) H.-T.Hsu, E. Rice, (★) J. Wilson, S. Semborski, P. Vayanos, M. Morton, *The Journal of Primary Prevention*, 40(5):529-544, 2019.
- [16] “Linking homelessness vulnerability assessments to housing placements and outcomes for youth,” E. Rice, M. Holguin, H.-T. Hsu, M. Morton, P. Vayanos, M. Tambe, and (★) H. Chan, *Cityscape*, 20(3):69-86, Office of Policy Development and Research (PD&R) of the US Department of Housing and Urban Development (HUD), 2018.
- [17] “Robust multiclass queuing theory for wait time estimation in resource allocation systems,” C. Bandi, N. Trichakis and P. Vayanos. *Management Science*, 65(1):152-187, 2018.
- Alphabetical author order
- [18] “Chance-constrained optimization for refinery blend planning under uncertainty,” Y. Yang, P. Vayanos and P.I. Barton. *Industrial & Engineering Chemistry Research*, 56 (42):12139-12150, 2017.
- [19] “A constraint sampling approach for multi-stage robust optimization,” P. Vayanos, D. Kuhn and B. Rustem. *Automatica*, 48(3):459-471, 2012.
- [20] “Characterization of signal modality: exploiting signal nonlinearity in machine learning and signal processing,” B. Jelfs, S. Javidi, P. Vayanos and D.P. Mandic. *Journal of Signal Processing Systems*, 61(1):105-115, 2009.
- [21] “Online detection of the modality of complex-valued real world signals,” D.P. Mandic, P. Vayanos, M. Chen and S.-L. Goh. *International Journal of Neural Systems*, 18(2):67–74, 2008.

RIGOROUSLY
REFEREED
CONFERENCE
PAPERS

Below, acceptance rates are shown whenever available.

- [22] “Learning fair policies for multi-stage selection problems from observational data,” (★) Z. Jia, G.A. Hanasusanto, P. Vayanos, W. Xie. Accepted for publication in *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI’24)*, 2024.
- Acceptance rate 21.3% in year of submission
 - Special Track on Safe, Robust and Responsible AI

- [23] “Deploying a robust active preference elicitation algorithm on MTurk: experiment design, interface, and evaluation for COVID-19 patient prioritization,” (★) C.M. Johnston, (★) P. Vossler, (★) S. Blessenohl, P. Vayanos. Under review for publication in *Proceedings of the ACM conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO’23)*, 2023.
- Acceptance rate 18% in year of submission
 - Research presented as part of my TED AI 2023 Talk
- [24] “Learning optimal fair classification trees: trade-offs between interpretability, fairness, and accuracy,” (★) N. Jo, (★) S. Aghaei, (★) J. Benson, A. Gómez, P. Vayanos. Accepted for publication in *Proceedings of AIES conference on Artificial Intelligence, Ethics, and Society*, 2023.
- Acceptance rate 28.9% in year of submission
- [25] “Fairness in contextual resource allocation systems: metrics and incompatibility results,” (★) N. Jo, (★) B. Tang, (★) K. Dullerud, (★) S. Aghaei, E. Rice, P. Vayanos. In *Proceedings of the 37th AAAI Conference on Artificial Intelligence (AAAI)*, 2023.
- Nathan Jo and Bill Tang contributed equally (joint first authors)
 - Acceptance rate 19.6% in year of submission
- [26] “Learning resource allocation policies from observational data with an application to homeless services delivery,” (★) A. Rahmattalabi, P. Vayanos, (★) K. Dullerud, E. Rice. *ACM Conference on Fairness, Accountability, and Transparency (FAccT)*, 2022.
- Highlighted as “Committee’s Choice” presentation at INFORMS Annual Meeting 2021
 - Acceptance rate 25.2% in year of submission
- [27] “Fair influence maximization: a welfare optimization approach,” (★) A. Rahmattalabi, S. Jabbari, H. Lakkaraju, P. Vayanos, M. Zellner, R. Brown, E. Rice, M. Tambe. In *Proceedings of the 35th AAAI Conference on Artificial Intelligence (AAAI)*, 2021.
- Acceptance rate 21.4% in year of submission
- [28] “Exploiting bounded rationality in risk-based cyber camouflage games,” (★) O. Thakoor, S. Jabbari, P. Aggarwal, C. Gonzales, M. Tambe, P. Vayanos. In *Proceedings of the 11th International Conference (GameSec)*, 2020.
- [29] “Exploring algorithmic fairness in robust graph covering problems,” (★) A. Rahmattalabi, P. Vayanos, A. Fulginiti, E. Rice, B. Wilder, A. Yadav, M. Tambe. In *Proceedings of the 33rd Conference on Neural Information Processing Systems (NeurIPS)*, 2019.
- Acceptance rate 21.6% in year of submission
- [30] “The street-level realities of data practices in homeless services provision,” (★) N. Karusala, (★) J. Wilson, P. Vayanos, E. Rice. In *Proceedings of the 22nd ACM on Human-Computer Interaction 3, Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)*, 2019.
- Acceptance rate 23.8% in year of submission
- [31] “Cyber camouflage games for strategic deception,” (★) O. Thakoor, M. Tambe, P. Vayanos, H. Xu, C. Kiekintveld, F. Fang. In *Proceedings of the 10th International Conference (GameSec)*, 2019.
- [32] “Learning optimal and fair decision-trees for non-discriminative decision-making,” (★) S. Aghaei, (★) M. J. Azizi, P. Vayanos. In *Proceedings of the 33rd AAAI Conference on Artificial Intelligence (AAAI)*, 2019.
- Acceptance rate 16.2% in year of submission

- [33] “Imbalanced collusive security games,” H.-C. Ou, M. Tambe, B. Dilkina, P. Vayanos. In *Proceedings of the 9th International Conference (GameSec)*, 2018.
- Acceptance rate 63.6% in year of submission
- [34] “A robust optimization approach to designing near-optimal strategies for constant-sum monitoring games,” (★) A. Rahmattalabi, P. Vayanos, and M. Tambe. In *Proceedings of the 9th International Conference (GameSec)*, 2018.
- Acceptance rate 63.6% in year of submission
- [35] “From empirical analysis to public policy: evaluating housing systems for homeless youth,” (★) H. Chan, E. Rice, P. Vayanos, M. Tambe, and M. Morton. In *Proceedings of European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD)*, 2018.
- Acceptance rate 25.1% in year of submission
- [36] “The price of usability: designing operationalizable strategies for security games,” (★★) S. McCarthy, (★) C. Laan, K. Wang, P. Vayanos, M. Tambe, and, A. Sinha. In *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)*, 2018.
- Acceptance rate 20.5% in year of submission
- [37] “Designing fair, efficient, and interpretable policies for prioritizing homeless youth for housing resources,” (★) M. J. Azizi, P. Vayanos, B. Wilder, E. Rice and M. Tambe. In *Proceedings of the 15th International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR)*, 2018.
- Invited to *Constraints* journal fast track for outstanding papers
- [38] “Learning about cyber deception through simulations: predictions of human decision making with deceptive signals in Stackelberg security games,” E. A. Cranford, C. Lebiere, C. Gonzales, S. Cooney, P. Vayanos, M. Tambe. In *Proceedings of CogSci*, 2018.
- Acceptance rate 22.5% in year of submission
- [39] “Deceiving cyber adversaries: a game theoretic approach,” A. Schlenker, M. Tambe, L. Tran-Thanh, P. Vayanos, Y. Vorobeychik, O. Thakoor, H. Xu, and F. Fang. In *Proceedings of the 17th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2018.
- Acceptance rate 25.3% in year of submission
- [40] “Equilibrium refinement in security games with arbitrary scheduling constraints,” K. Wang, Q. Guo, P. Vayanos, M. Tambe, and B. An. In *Proceedings of the 17th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2018.
- Acceptance rate 25.3% in year of submission
- [41] “Strategic coordination of human patrollers and mobile sensors with signaling for security games,” H. Xu, K. Wang, P. Vayanos, and M. Tambe. In *Proceedings of the 32nd AAAI Conference on Artificial Intelligence (AAAI)*, 2018.
- Acceptance rate 24.6% in year of submission
- [42] “Utilizing housing resources for homeless youth through the lens of multiple multi-dimensional knapsacks,” (★) H. Chan, L. Tran-Thanh, B. Wilder, E. Rice, P. Vayanos, M. Tambe. In *Proceedings of the AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES)*, 2018.

- [43] “Adjustable robust optimization for multi-stage threat screening games,” (★★) S. McCarthy, P. Vayanos, and M. Tambe, In *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)*, pp. 3770–3776, 2017.
- Acceptance rate 26.0% in year of submission
- [44] “Decision rules for information discovery in multi-stage stochastic programming,” P. Vayanos, D. Kuhn and B. Rustem. In *Proceedings of the 50th IEEE Conference on Decision and Control (CDC)*, pp. 7368–7373, 2011.
- [45] “Hedging electricity swing options in incomplete markets,” P. Vayanos, W. Wiesemann and D. Kuhn. In *Proceedings of the 18th IFAC World Congress*, pp. 846–853, 2011.
- Acceptance rate 68.3% in year of submission
- [46] “Online tracking of the degree of nonlinearity within complex signals,” D.P. Mandic, P. Vayanos, S. Javidi, B. Jelfs and K. Aihara. In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 2061–2064, 2008.
- [47] “Collaborative adaptive learning using hybrid filters,” D.P. Mandic, P. Vayanos, C. Boukis, B. Jelfs, S.-L. Goh, T. Gautama and T.M. Rutkowski. In *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 3:921–924, 2007.
- [48] “An online method for detecting nonlinearity within a signal,” B. Jelfs, P. Vayanos, M. Chen, S.-L. Goh, C. Boukis, T. Gautama, T.M. Rutkowski, T. Kuh and D.P. Mandic. In *Proceedings of the 10th International Conference on Knowledge-Based & Intelligent Information & Engineering Systems*, 4253:1216–1223, 2006.
- [49] “Conserving biodiversity via adjustable robust optimization,” (★) Y. Ye, (★) C. Doehring, A. Georghiou, H. Robinson, P. Vayanos. In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS) Workshop on Autonomous Agents for Social Good*, 2022.
- [50] “Learning optimal prescriptive trees from observational data,” (★) N. Jo, (★) S. Aghaei, A. Gómez, P. Vayanos. In *36th AAAI Conference on Artificial Intelligence (AAAI)*, AAAI Workshop on AI for Behavior Change, 2022.
- [51] “Optimal robust classification trees,” (★) N. Justin, (★) S. Aghaei, A. Gómez, P. Vayanos. In *36th AAAI Conference on Artificial Intelligence (AAAI)*, AAAI Workshop on Adversarial Machine Learning and Beyond, 2022.
- [52] “Preference elicitation and aggregation to aid with patient triage during the COVID-19 pandemic,” (★) C. Johnston, (★) S. Blessenhohl, P. Vayanos, *International Conference on Machine Learning (ICML) Workshop on Participatory Approaches to Machine Learning*, 2020
- [53] “Preference elicitation and aggregation to aid with patient triage during the COVID-19 pandemic,” (★) C. Johnston, (★) S. Blessenhohl, P. Vayanos, *Harvard CRCS Workshop on AI for Social Good*, 2020
- [54] “Fairness in public health preventative interventions,” (★) A. Rahmattalabi, S. Jabbari, H. Lakkaraju, P. Vayanos, M. Tambe. In *34th AAAI Conference on Artificial Intelligence (AAAI)*, Health Intelligence Workshop, 2020.
- [55] “Robust active preference elicitation,” (★) D. McElfresh, P. Vayanos, J. Dickerson, E. Rice, *Revenue Management & Pricing Conference*, 2019.

REFEREED
WORKSHOP
PAPERS

REFEREED
EXTENDED
ABSTRACTS

- [56] “Evidence from the past: AI decision aids to improve housing systems for homeless youth,” (★) H. Chan, E. Rice, P. Vayanos, M. Tambe, and M. Morton. In *Proceedings of the Association for the Advancement of Artificial Intelligence (AAAI) 2017 Fall Symposium Series*, 2017.
- [57] “Explanation systems for influence maximization algorithms,” A. Yadav, (★) A. Rahmattalabi, E. Kamar, P. Vayanos, M. Tambe, and V.L. Noronha In *Proceedings of the 3rd International Workshop on Social Influence Analysis*, 2017.
- [58] “Online detection of the nature of complex-valued signals,” P. Vayanos, S.-L. Goh and D.P. Mandic. In *Proceedings of the 16th IEEE Signal Processing Society Workshop on Machine Learning for Signal Processing (MLSP)*, pp. 173–178, 2006.
- [59] “Learning optimal fair classification trees,” (★) N. Jo, (★) S. Aghaei, (★) J. Benson, A. Gómez, P. Vayanos. In *Proceedings of the 19th International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR)*, 2022.
- [60] “Optimal robust classification trees,” (★) N. Justin, (★) S. Aghaei, A. Gómez, P. Vayanos. In *Proceedings of the 19th International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR)*, 2022.
- [61] “Learning optimal classification trees: strong max-flow formulations,” (★) S. Aghaei, A. Gomez, P. Vayanos. Extended abstract in *Proceedings of the 17th International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR)*, 2020.
- [62] “Robust peer-monitoring on graphs with an application to suicide prevention in social networks,” (★) A. Rahmattalabi, P. Vayanos, A. Fulginiti, M. Tambe. *18th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2019.
- [63] “General-sum cyber deception games under partial attacker valuation information,” (★) O. Thakoor, M. Tambe, P. Vayanos, H. Xu, C. Kiekintveld. *18th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2019.

JOURNAL PAPERS
IN PREPARATION

- [64] “Data-driven multistage robust classification with fairness constraints,” (★) Z. Jia, G.A. Hanasusanto, P. Vayanos, W. Xie. In preparation for submission to *Operations Research*, 2024.
- [65] “Distributionally robust optimization with decision-dependent information discovery,” (★) Q. Jin, A. Georghiou, P. Vayanos, G. Hanasusanto. In preparation for submission to *Mathematical Programming*, 2024.
- [66] “Conserving biodiversity via adjustable robust optimization,” (★) Y. Ye, (★) C. Doehring, A. Georghiou, H. Robinson, P. Vayanos. In preparation for submission to *Management Science*, 2024.
- [67] “Robust multi-stakeholder preference elicitation and aggregation,” (★) C. Johnston, (★) S. Blessenhohl, P. Vayanos. In preparation for submission to *Operations Research*, 2024.

BOOK CHAPTERS

- [68] “Using Algorithmic Solutions to Address Gatekeeper Training Issues for Suicide Prevention on College Campuses”, A. Fulginiti, A. Rahmattalabi, J. Call, P. Vayanos, and E. Rice. In S. Suen, D. Scheinker, and E. Enns (Eds.), *Artificial Intelligence for Healthcare: Interdisciplinary Partnerships for Analytics-driven Improvements in a Post-COVID World*, pp. 83-109. Cambridge University Press, 2022.

- [69] “Collaborative adaptive filters for online knowledge extraction and information fusion”, B. Jelfs, P. Vayanos, S. Javidi, S.-L. Goh and D.P. Mandic. *Signal Processing Techniques for Knowledge Extraction and Information Fusion*, pp. 1-20. Springer, 2008.
- [70] “Exploiting nonlinearity in adaptive signal processing”, P. Vayanos, M. Chen, B. Jelfs and D.P. Mandic. *Advances in Nonlinear Speech Processing*, vol. 4885 of *Lecture Notes in Computer Science*, pp. 57-77. Springer, 2007.

OPEN SOURCE
SOFTWARE
PACKAGES

- **ROC++**: a C++ based platform for modeling, automatically reformulating, and solving robust optimization problems and a Python interface, **ROPy**, in the form of a callable library, see <https://github.com/robust-opt-cpp/ROCPP>; it implements a number of the methods created in our group.
- **ODTlearn**: a package for tree-based statistical estimation and inference using optimal decision trees, see <https://github.com/D3M-Research-Group/odtlearn>; can learn optimal classification trees augmented with fairness constraints, optimal robust classification trees, and optimal prescriptive trees by implementing a number of the methods created in my group.

Please turn over.

GRANTS & GIFTS

Since joining USC, I have raised over \$2.3 million own share in research grants, including over \$2.1 million own share in external funding. I am also the Principal Investigator (PI) for two NSF grants with a total award amount of over \$1 million.

EXTERNAL RESEARCH GRANTS AS PI/CO-PI

- [1] **National Alliance to End Homelessness (NAEH)**: Permanent supportive housing (PSH)
Title: “Missouri Balance of State Continuum of Care Permanent Supportive Housing Prioritization: Research and Refinement”
Role: PI (Co-PI: Eric Rice)
Note: Subaward - University of North Carolina at Chapel Hill is the Lead (Lead PI: Hsun-Ta Hsu)
Total Award Period Covered: 10/01/2023 – 09/30/2025
Total Award Amount: \$91,989 (\$252,000 inclusive of North Carolina Chapel Hill share)
Own Share: \$79,708
- [2] **National Science Foundation, CAREER**, Operations Engineering
Title: “CAREER: Robust, Interpretable, and Fair Allocation of Scarce Resources in Socially Sensitive Settings”
Role: Sole PI
Total Award Period Covered: 05/01/2021-04/30/2026
Total Award Amount: \$519,682
- [3] **NSF Operations Engineering Program**, Operations Engineering
Title: “Preserving Biodiversity via Robust Optimization”
Role: PI (with co-PI: B. Dilkina)
Total Award Period Covered: 07/15/2018-06/30/2024
Total Award Amount: \$535,335
Own Share: \$403,638
- [4] **U.S. Army Research Office**
MURI (Multidisciplinary University Research Initiative)
Title: “Realizing Cyber Inception: Towards a Science of Personalized Deception for Cyber Defense”
Role: PI, since August 2019 (Original PI and project lead: M. Tambe)
Total Award Period Covered: 05/16/2017-04/30/2024
Total Award Amount: \$7,406,947
Own Share: \$313,353
- [5] **Conrad N. Hilton Foundation / United Way of Greater Los Angeles Home for Good**
Title: “CES Triage Tool Research & Refinement”
Role: co-PI (PI: Eric Rice)
Total Award Period Covered: 01/01/2020-03/31/2023
Total award amount: \$1,450,000
Own Share: \$334,000
- [6] **U.S. Army Research Laboratory**
Title: “Predictive Modeling for Early Identification of Suicidal Thinking in Social Networks”
Role: PI on satellite from USC School of Social Work (PI from SW: Eric Rice)
Total Award Period Covered: 09/28/2017-12/27/2022
Satellite Award Amount: \$12,420.

- [7] **National Science Foundation**, Smart & Connected Communities
 Title: “S&CC: Landslide Risk Management in Remote Communities: Integrating Geoscience, Data Science, and Social Science in Local Context”
 Role: co-PI (PI: Robert Lempert; Collaborative Grant with RAND, University of Oregon, Sitka Sound Science Center)
 Total Award Period Covered: 9/01/2019-09/30/2022
 Total Award Amount: \$2,100,974
 Own Share: \$216,218.
- [8] **METRANS University Transportation Center**, U.S. Department of Transportation
 Title: “Cost-Sharing Mechanisms for Ridesharing”
 Role: co-PI (PI: Maged Dessouky)
 Total Award Period Covered: 09/2018-09/2019
 Total Award Amount: \$100,000
 Own Share: \$41,244
- [9] **METRANS University Transportation Center**, U.S. Department of Transportation
 Title: “Socially Optimal Personalized Routing with Preference Learning”
 Role: PI (co-PI: Maged Dessouky)
 Total Award Period Covered: 08/2017-07/2018
 Total Award Amount: \$99,998
 Own Share: \$79,096
- [10] **Lockheed Martin Corporation (Primary : DARPA)**
 Multiplayer attacker-defender security games
 Period: 12/17/2017-07/18/2018
 Role: co-PI (PI: Milind Tambe, co-PI: Bistra Dilkina)
 Total Amount: \$100,000
 Own Share: \$5,182.42
- [11] **U.S. Army Research Laboratory, Army Research Office (ARO)**
 Title: “Playing Security Games With No Time for Mapping Full Networks: Maximizing Influence in Uncharted Social Networks”
 Role: co-PI (PIs: Milind Tambe and Eric Rice)
 Total Award Period Covered: 02/01/2017-09/01/2017
 Total Award Amount: \$500,000
 Own Share: \$150,000
- [12] As postdoc at MIT, devised and wrote two project proposals that led to a total of \$180,000 being secured by MIT to support my research

EXTERNAL
 RESEARCH
 GRANTS AS SENIOR
 PERSONNEL

- [13] **Schmidt Futures** (formerly Schmidt Sciences)
 Title: USC Center for Artificial Intelligence in Society Summer Fellows Program 2018
 Role: Senior Personnel / Contributor (PIs: Milind Tambe and Eric Rice)
 Total Award Amount: \$250,000
 Total Award Period Covered: 01/01/2018-12/31/2018
 Own share: \$50,000

INTERNAL
RESEARCH
GRANTS AS
PI/CO-PI

- [14] **USC-Meta Center for Research and Education in AI and Learning**
Title: “Interpretable Causal Predictive and Prescriptive Analytics Robust to Unobserved Confounders”
Role: PI (co-PI: Andres Gomez)
Total Award Period Covered: 08/16/2022-08/15/2023
Total Award Amount: \$74,999
Own Share: \$68,102
- [15] **USC Zumberge Special Solicitation
Epidemic & Virus Related Research and Development award**
Title: “Addressing Ethical Dilemmas during the COVID-19 Pandemic through AI”
Role: Sole PI
Total Award Period Covered: 07/01/2020-04/30/2023
Total Award Amount: \$28,047
- [16] **USC Zumberge Faculty Research & Innovation Fund
Diversity & Inclusion Grant Program**
Title: “Designing Fair, Efficient, and Interpretable Policies for Allocating Scarce Resources”
Role: Sole PI
Total Award Period Covered: 07/2018-07/2019
Total Award Amount: \$30,000
- [17] **Institute for Advanced Studies in Business**, Outlier Research Grant
Title: “Data-Driven Optimization in the Small Data Regime”
Role: Co-Investigator (PIs: Vishal Gupta and Paat Rusmevichientong)
Total Award Period Covered: 2017-no end date
Total Award Amount: \$25,000

GIFTS

- [18] **Boucher Charitable Gift Fund**
Total Gift Amount: \$200,000 over four years
Gift Date: 10/26/2023
Note: for the advancement of CAIS with particular focus on homelessness
- [19] **USC Viterbi School of Engineering**
Total Gift Amount: \$34,050
Gift Date: 08/22/2022
Note: for the advancement of CAIS
- [20] **Living to Love Another Day Foundation**
Total Gift Amount: \$5,000
Gift Date: 12/09/2019
Note: to cover incentives for deployment of suicide prevention intervention published at NeurIPS
- [21] **Trojan League of South Bay**
Total Gift Amount: \$1,000
Gift Date: 08/05/2020
Note: towards housing allocation project

- [22] **Microsoft AI for Earth**
Total Gift Amount: \$200,000
Total Award Period Covered: 01/01/2018-12/31/2018
Own share: \$12,570
Note: to support the CAIS to serve as a center of gravity in the AI research community to incentivize students and researchers to work on environmental conservation research questions with implementable, real-world applications.

SUPPLEMENTS

- [23] **National Science Foundation**, Operations Engineering
REU (Research Experience for Undergraduates) Supplement
Title: "CAREER: Robust, Interpretable, and Fair Allocation of Scarce Resources in Socially Sensitive Settings"
Role: Sole PI
Total Award Period Covered: 05/01/2021-04/30/2026
Total Award Amount: \$8,000
- [24] **National Science Foundation**, Operations Engineering
REU (Research Experience for Undergraduates) Supplement
Title: "Preserving Biodiversity via Robust Optimization"
Role: PI (with co-PI: B. Dilkina)
Total Award Period Covered: 07/15/2018-06/30/2023
Total Award Amount: \$8,000
Own Share: \$8,000

EXTERNAL
CONFERENCE &
TRAVEL GRANTS
AND GIFTS

- [25] **National Science Foundation**
Division of Information and Intelligent Systems (IIS) and Operations Engineering (OE)
Title: "Student Support and Mentorship Program for CPAIOR 2022"
Role: co-PI (PI: Thiago Serra)
Award #: 2223504
Total Award Period Covered: 07/01/2022-06/30/2023
Total Award Amount: \$9,963
- [26] **Artificial Intelligence Journal (AIJ)**
Title: "Student Support and Mentorship Program for CPAIOR 2022"
Gift Date: 06/06/2022
Total Award Amount: \$10,000
- [27] **nextmv**
Title: "Support for DEI mentorship program at CPAIOR 2022"
Gift Date: 02/17/2022
Total Gift Amount: \$500
- [28] **National Science Foundation**, Division of Mathematical Sciences
Title: "Conference on Non-Convex Statistical Learning"
Role: co-PI (PI: Jong-Shi Pang and co-PI: Meisam Razaviyayn)
Award #: 1719635
Total Award Period Covered: 04/15/2018-3/31/2018
Total Award Amount: \$15,000

INTERNAL
CONFERENCE &
TRAVEL GRANTS
AND GIFTS

- [29] **USC Epstein Department of Industrial & Systems Engineering**
Title: "Support for CPAIOR 2022"
Award Date: 04/13/2022
Total Award Amount: \$6,200

- [30] **USC-Meta Center for Research and Education in AI and Learning**
Title: “Support for CPAIOR 2022”
Award Date: 03/30/2022
Total Award Amount: \$2,100
- [31] **USC ISE Epstein Institute**, Epstein Department of Industrial & Systems Engineering
Title: “Support for CPAIOR 2022”
Award Date: 03/23/2022
Total Award Amount: \$12,630

PROPOSALS
PENDING

- [32] **Microsoft Research**, AI & Society Fellows
Title: “Integrating community-based and quantitative tools to measure harms of AI”
Role: PI
Total Award Period Covered: 02/2024-02/2025
Total Award Amount: \$45,000
- [33] **National Science Foundation**, Research Traineeship (NRT) Program
Title: “NRT-AI: Integrating Artificial Intelligence and Operations Research Technologies (Track 1)”
Role: co-PI (PI: Sven Koenig; co-PIs: Bistra Dilkina, Vishal Gupta, Meisam Razaviyayn; SPs: Andrés Gómez, Vatsal Sharan, Renyuan Xu, Yolanda Gil, Gisele Ragusa)
Proposal #: 2346058
Total Award Period Covered: 03/2024-02/2029
Total Award Amount: \$3,000,000
- [34] **National Science Foundation**, AI-Institutes (preproposal)
Title: “Theme 3: Institute for Trustworthy Agents in an AI-Mediated Society (TAIM-AI)”
Role: co-PI (PI: David Pennock; co-PIs: Lirong Xia, Samantha Kleinberg, Sanmay Das)
Proposal #: 2416295
Total Award Period Covered: (preproposal, no dates)
Total Award Amount: \$0 (preproposal, no budget)

Please turn over.

PRESENTATIONS/WORKSHOPS/PANELS

- PRESENTATIONS TO THE BROADER PUBLIC
- [1] *AI to learn fair, efficient, and interpretable policies for allocating housing to persons experiencing homelessness*
HUD (Department of Housing and Urban Development) Internal Learning Space on AI
Virtual Presentation (Jan. 2024)
 - [2] *AI to learn fair, efficient, and interpretable policies for allocating housing to persons experiencing homelessness*
AI and Affordable Housing: A National Symposium
Virtual Presentation (Dec. 2023)
 - [3] *TED Talk: AI could increase equality – if we design it right*
TED AI Event
See here: https://www.ted.com/talks/phebe_vayanos_ai_could_increase_equality_if_we_design_it_right
San Francisco, CA (Oct. 2023)
- PLENARY, SEMI-PLENARY, & KEYNOTE TALKS
- [4] *Learning optimal, robust, and fair decision-trees for prediction and prescription using MIO*
AAAI 2024 Workshop on Artificial Intelligence for Operations Research
AAAI Conference on Artificial Intelligence
Vancouver, BC (Feb. 2024)
 - [5] *Integer optimization for predictive and prescriptive analytics in high stakes domains*
SoCal Machine Learning Symposium
Keynote talk, UC San Diego, CA (Mar. 2021)
 - [6] *Designing robust, interpretable, and fair social and public health interventions*
IJCAI 2021 Workshop on AI for Social Good
International Joint Conference on Artificial Intelligence
Keynote talk, virtual (Jan. 2021)
 - [7] *AI-driven housing allocation for homeless persons*
Partnership on AI/IBM Explainability Workshop
Plenary invited talk, New York, NY (Feb. 2020)
 - [8] *AI & robust optimization for social good*
CP 2019 International Conference on Principles and Practice of Constraint Programming
Plenary invited talk, Stamford, CT (Sept. 2019)
 - [9] *Robust active preference elicitation to learn the moral priorities of policy-makers at LAHSA*
ICSP 2019 International Conference on Stochastic Programming
Semi-plenary invited talk at mini-symposium on *Doing Good with Good RO*
Trondheim, NO (Jul. 2019)
 - [10] *Assisting vulnerable communities through AI and OR: from data to deployed decisions*
ICML 2019 Workshop on AI for Social Good
International Conference on Machine Learning
Keynote talk, Long Beach, CA (Jun. 2019)
- DISTINGUISHED SEMINARS
- [11] *AI & robust optimization for social good*
Clemson University Distinguished Speaker Series
Part of a National Science Foundation Research Traineeship (NRT) Program grant (Nov. 2019)

- [12] *AI could help mitigate inequality – if we design it right*
John Brooks Slaughter Leadership in Engineering DEI Summit
Hosted by Dean Yiannis Yortsos and Chief Inclusion and Diversity Officer Kenneth Bonner
University of Southern California, Los Angeles, CA (Feb. 2024)
- [13] *Learning policies for allocating scarce housing resources to persons experiencing homelessness*
Workshop on Fairness in Operations and AI
Columbia University, New York, NY (Nov.-Dec. 2023)
- [14] *Learning optimal classification trees robust to distribution shifts*
Mixed-Integer Programming (MIP) Workshop
University of Southern California, Los Angeles, CA (May 2023)
- [15] *Integer optimization for machine learning in high-stakes domains*
IPAM's Workshop Artificial Intelligence and Discrete Optimization
Institute for Pure & Applied Mathematics, Los Angeles, CA (Feb.-Mar. 2023)
- [16] *Designing policies for allocating scarce housing to persons experiencing homelessness*
Future of Analytics workshop in honor of Dimitris Bertsimas' 60th birthday
INFORMS 2022 Annual Meeting, Indianapolis (Oct. 2022)
- [17] *Robustness, interpretability, and fairness in machine learning and resource allocation*
Third Annual Responsible Machine Learning Virtual Summit, AI and Social Good
UC Santa Barbara Center for Responsible Machine Learning (CRML)
Department of Computer Science, College of Engineering (Oct. 2021)
- [18] *Data-driven decision-making for social impact*
Virtual workshop on Artificial Intelligence/Operations Research
Sponsored by the Computing Community Consortium (CCC), the Institute for Operations Research and Management Science (INFORMS), and ACM SIGAI (Sep. 2021)
- [19] *Designing efficient and equitable housing allocation policies from data collected in deployment*
CAIS Symposium on Equity and AI, University of Southern California, LA (Apr. 2021)
- [20] *Robust interventions in social services and conservation*
Workshop on Optimization under Uncertainty, part of the thematic semester on "The Mathematics of Decision Making," Centre de Recherches Mathématiques (CRM)
Montreal, QC (Sep. 2021)
- [21] *Dealing with value disagreement in algorithmic systems via preference elicitation and aggregation*
Interdisciplinary Workshop on "Algorithmic Ethics: Perspectives from Philosophy and Computer Science," University of Rochester (Online Workshop) (May 2020)
- [22] *Two-stage robust optimization with decision-dependent information discovery*
ICERM (Institute for Computational and Experimental Research in Mathematics) Workshop on Mathematical Optimization of Systems Impacted by Rare, High-Impact Random Events, Providence, RI (Jun. 2019)
- [23] *Two-stage robust optimization with decision-dependent information discovery*
Banff Workshop on "Models and Algorithms for Sequential Decision Problems under Uncertainty" (invited talk), Banff, AB (Jan. 2019)
- [24] *Artificial Intelligence for social good: the case of public health*
Workshop on Artificial Intelligence and Social Good
Microsoft Research India, Bangalore, IN (Oct. 2017)

- [25] *Robust wait time estimation in resource allocation systems with application to kidney allocation*
Workshop on Distributionally Robust Optimization
Banff International Research Station, Alberta, CN (Mar. 2018)
- [26] *Robust wait time estimation in resource allocation systems with application to kidney allocation*
Bay Area Optimization Meeting 2017 - From Data to Decisions, dedicated to Professor Roger J.-B. Wets on the occasion of his 80th birthday
University of California Davis, Davis, CA (May 2017)
- [27] *Robust wait time estimation in resource allocation systems with application to kidney allocation*
USC WiSE Research Symposium, Los Angeles, CA (Mar. 2017)
- [28] *Robust wait time estimation in resource allocation systems with application to kidney allocation*
SoCal OR/OM Day 2016, UC Irvine, Irvine, CA (May 2016)
- INDUSTRY SEMINARS
- [29] *Learning policies for allocating scarce housing to persons experiencing homelessness*
Microsoft Research, Research for Industry group (Apr. 2023)
- WEBINAR TALKS
- [30] *Learning policies for allocating scarce housing to persons experiencing homelessness*
INFORMS Data Mining Society DEI Webinar (Mar. 2023)
- [31] *Learning optimal classification trees robust to distribution shifts*
Robust Optimization Webinar series
Organized by Dick den Hertog, Jannis Kurtz, and Ahmadreza Marandi (Apr. 2023)
- [32] *Integer optimization for predictive and prescriptive analytics in high stakes domains*
Machine Learning NeEDS Mathematical Optimization, virtual seminar series
IMUS-Instituto de Matemáticas de la Universidad de Sevilla and CBS-Copenhagen Business School (Apr. 2021)
- [33] *Active preference elicitation via adjustable robust optimization*
Discrete Optimization Talks (May 2020)
- UNIVERSITY SEMINARS
- [34] *Learning Optimal, Interpretable, and Fair Policies for Allocating Housing to Persons Experiencing Homelessness*
Imperial College Business School Seminar Series
Imperial College London, London UK (Mar. 2024)
- [35] *Learning Optimal, Interpretable, and Fair Policies for Allocating Housing to Persons Experiencing Homelessness*
Department of Economics and Management (DEM)
University of Luxembourg (Mar. 2024)
- [36] *Title TBD*
Seminar speaker series centered on AI and the human sciences
University of Florida, Gainesville, FL (date TBD)
- [37] *Learning policies for allocating scarce housing to persons experiencing homelessness*
ISE Seminar Series
Lehigh University, Bethlehem, PA (Nov. 2023)

- [38] *Learning policies for allocating scarce housing to persons experiencing homelessness*
Pitt IE Seminar Series
University of Pittsburgh, Pittsburgh, PA (Nov. 2023)
- [39] *Learning policies for allocating scarce housing to persons experiencing homelessness*
Data Sciences Speaker Series
University of Toronto, Toronto, ON (May 2023)
- [40] *Learning policies for allocating scarce housing to persons experiencing homelessness*
Department of Mechanical & Industrial Engineering
University of Illinois at Chicago, Chicago, IL (Apr. 2023)
- [41] *Learning policies for allocating scarce housing to persons experiencing homelessness*
Cornell Tech Learning Machines Seminar
Cornell Tech, New York City, NY (Apr. 2023)
- [42] *Robustness, interpretability, and fairness in analytics for social impact*
Department of Industrial & Systems Engineering Colloquium Series
University of Wisconsin Madison (Sept. 2022)
- [43] *Robustness, interpretability, and fairness in predictive and prescriptive analytics for social impact*
Institute of Operations Research and Analytics (IORA) Seminar Series
National University of Singapore (Sep. 2022)
- [44] *Robustness, interpretability, and fairness in predictive and prescriptive analytics for social impact*
Department Seminar, Industrial & Systems Engineering (ISE)
University of Florida Gainesville (Mar. 2022)
- [45] *Robustness, interpretability, and fairness in predictive and prescriptive analytics for social impact*
Department Seminar, Industrial & Systems Engineering (ISyE)
University of Minnesota Twin-Cities (Apr. 2022)
- [46] *Designing robust, interpretable, and fair social and public health interventions*
Waterloo Computational Mathematics colloquium, Centre for Computational Mathematics
University of Waterloo (Nov. 2021)
- [47] *Designing robust, interpretable, and fair social and public health interventions*
University of Michigan Institute for Data Science (MIDAS) Seminar
University of Michigan Ann Arbor (Nov. 2021)
- [48] *Towards efficient, interpretable, and fair social interventions*
B'AI Global Forum at the University of Tokyo (Aug. 2021)
- [49] *Designing robust, interpretable, and fair social and public health interventions*
Department of Statistics and Operations Research, ISOR Colloquium
University of Vienna, virtual seminar (Apr. 2021)
- [50] *Designing robust, interpretable, and fair social and public health interventions*
Culverhouse College of Business, University of Alabama, virtual seminar (Mar. 2021)
- [51] *Designing robust, interpretable, and fair social and public health interventions*
School of Industrial and Systems Engineering
University of Oklahoma, virtual seminar (Feb. 2021)

- [52] *Designing robust, interpretable, and fair social and public health interventions*
Foster School of Business, Departmental Seminar
University of Washington Seattle, virtual seminar (Jan. 2021)
- [53] *Active preference elicitation via adjustable robust optimization*
Computational and Data Sciences guest presentation
Washington University in St. Louis, St. Louis, MO (Dec. 2020)
- [54] *Active preference elicitation via adjustable robust optimization*
Department of Industrial & Systems Engineering Colloquium Series
University of Wisconsin Madison (Dec. 2020)
- [55] *AI and robust Optimization for social good*
Data for Good Seminar Series, Data Science Institute, Columbia University, NY (Oct. 2020)
- [56] *Robust active preference elicitation to learn the preferences of policy-makers at the Los Angeles Homeless Services Authority*
Washington University in Saint Louis, Colloquium Talk
Computer Science & Engineering, St. Louis, MO (Nov. 2019)
- [57] *Robust optimization with decision-dependent information discovery: active learning of the moral priorities of policy-makers*
Industrial Engineering & Management Sciences, Departmental Seminar
Northwestern University, Evanston, IL (May 2019)
- [58] *Robust optimization with decision-dependent information discovery: active learning of the moral priorities of policy-makers*
Industrial Engineering & Operations Research, Departmental Seminar
University of Texas, Austin, TX (May 2019)
- [59] *Data-driven integer and robust optimization for scarce resource allocation*
Department of Mechanical and Industrial Engineering, OR Seminar
University of Toronto, Toronto, ON (Sept. 2018)
- [60] *Data-driven integer and robust optimization for scarce resource allocation*
Department of Industrial Engineering & Operations Research, IEOR-DRO Seminar
Columbia University, New York, NY (Apr. 2018)
- [61] *Data-driven integer and robust optimization for scarce resource allocation*
Industrial and Operations Engineering, IOE Seminar
University of Michigan, Ann Arbor, MI (Apr. 2018)
- [62] *Data-driven integer and robust optimization for scarce resource allocation*
Guest Lecture in “AI for Social Good” seminar course at Institute for Software Research
Carnegie Mellon University, Pittsburgh, PA (Mar. 2018)
- [63] *Optimization and analytics for social good*
H. Milton Stewart School of Industrial & Systems Engineering, ISyE Special Seminar
Georgia Tech, Atlanta, GA (Nov. 2017)
- [64] *Optimization and analytics for social good*
Department of Industrial & Systems Engineering, Graduate Seminar Series
University of Washington, Seattle, WA (Nov. 2017)

- [65] *AI for Social Good*
USC CAIS Seminar Series 2017
University of Southern California, Los Angeles, CA (Sep. 2017)
- [66] *Dynamic learning and information discovery: an adaptive optimization perspective*
Department of Electrical Engineering
University of Southern California, Los Angeles, CA (Nov. 2015)
- [67] *Dynamic learning and information discovery: an adaptive optimization perspective*
Department of Computer Science, Teamcore Seminar
University of Southern California, Los Angeles, CA (Oct. 2015)
- [68] *Data-driven learning under uncertainty: an adaptive optimization perspective*
Information and Decision Sciences, UIC College of Business
University of Illinois Chicago, Chicago, IL (Mar. 2015)
- [69] *Data-driven learning under uncertainty: an adaptive optimization perspective*
MIT Sloan Operations Management Seminar
MIT Sloan School of Management, Cambridge, MA (Mar. 2015)
- [70] *Data-driven learning under uncertainty: an adaptive optimization perspective*
Amazon Seller Services, Fulfillment By Amazon, Amazon, Seattle, WA (Mar. 2015)
- [71] *Data-driven learning under uncertainty: an adaptive optimization perspective*
Industrial and Systems Engineering Seminar
University of Southern California, Los Angeles, CA (Mar. 2015)
- [72] *Data-driven learning under uncertainty: an adaptive optimization perspective*
Mechanical and Industrial Engineering, University to Toronto, Toronto, ON (Feb. 2015)
- [73] *Data-driven learning under uncertainty: an adaptive optimization perspective*
Operations Research & Industrial Engineering
University of Texas at Austin, Austin, TX (Feb. 2015)
- [74] *Data-driven learning under uncertainty: an adaptive optimization perspective* Industrial and Systems Engineering Seminar, University of Florida, Gainesville, FL (Feb. 2015)
- [75] *Data-driven learning in dynamic pricing using adaptive optimization*
Industrial and Systems Engineering, Lehigh University (invited talk), Bethlehem, PA (Oct. 2014)
- [76] *Refinery optimization: blend planning under uncertainty*
BP-MIT Conversion Research Program Technical Meeting, Boston, MA (May 2013)
- [77] *Decision rules for information discovery in multi-stage stochastic programming*
Industrial Consortium Meeting of the Centre for Process Systems Engineering
Imperial College London, UK (Dec. 2011)
- [78] *Hedging electricity swing options in incomplete markets*
Industrial Consortium Meeting of the Centre for Process Systems Engineering
Imperial College, London, UK (Dec. 2010)
- [79] *Tutorial: OR and AI for society*
2022 CORS / INFORMS International Conference, Vancouver, BC (Jun. 2022)

INVITED
CONFERENCE
PRESENTATIONS

- [80] *Conducting research in AI, ML, and OR for social good*
CORS 2021 Annual Conference of the Canadian Operational Research Society (Jun. 2021)
- [81] *Robust active preference elicitation to learn the moral priorities of policy-makers at LAHSA*
CPAIOR 2019 Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research, Thessaloniki, Greece (Jun. 2019)
- [82] *Robust optimization & sequential decision-making*
Doctoral Consortium on Computational Sustainability 2017
University of Southern California, Los Angeles, CA (Jul. 2017)
- [83] *Bringing STEM education to underserved communities*
“Committee’s Choice” presentation, INFORMS Annual Meeting, virtual (Oct. 2021)
- [84] *Robust active preference elicitation via adjustable robust optimization*
CORS Annual Meeting, virtual (Jun. 2021)
- [85] *Robust optimization with decision-dependent information discovery*
INFORMS Annual Meeting, virtual (Nov. 2020)
- [86] *Robust active preference elicitation to learn the moral priorities of policy-makers at LAHSA*
INFORMS Annual Meeting, Seattle, WA (Oct. 2019)
- [87] *Robust active preference elicitation to learn the moral priorities of policy-makers at LAHSA*
ICCOPT International Conference on Continuous Optimization, Berlin, DE (Aug. 2019)
- [88] *Two-stage robust optimization with decision-dependent information discovery*
INFORMS Annual Meeting, Phoenix, AZ (Nov. 2018)
- [89] *Designing fair, efficient, and interpretable policies for prioritizing homeless youth for housing*
INFORMS Annual Meeting, Seattle, WA (Oct. 2019)
- [90] *Designing fair, efficient, and interpretable policies for prioritizing homeless youth for housing*
International Symposium on Mathematical Programming, Bordeaux, FR (Jul. 2018)
- [91] *Designing fair, efficient, and interpretable policies for prioritizing homeless youth for housing*
International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research, Delft, NL (Jun. 2018)
- [92] *Robust wait time estimation in resource allocation systems with application to kidney allocation*
INFORMS (invited talk), Houston, TX (Oct. 2017)
- [93] *Robust wait time estimation in resource allocation systems with application to kidney allocation*
CMS Computational Management Science, Bergamo, IT (May 2017)
- [94] *Robust wait time estimation in resource allocation systems with application to kidney allocation*
POMS, Seattle, WA (May 2017)
- [95] *Robust wait time estimation in resource allocation systems with application to kidney allocation*
ICCOPT, Tokyo, JP (Aug. 2016)
- [96] *Robust wait time estimation in resource allocation systems with application to kidney allocation*
INFORMS International Conference, Waikoloa Village, HI (Jun. 2016)

- [97] *Data-driven learning in dynamic pricing using adaptive optimization*
INFORMS Annual Meeting, Philadelphia, PA (Nov. 2015)
- [98] *Data-driven learning in dynamic pricing using adaptive optimization*
ISMP 2015, Pittsburgh, PA (Jul. 2015)
- [99] *Data-driven learning in dynamic pricing using adaptive optimization*
POMS 26th Annual Conference, Washington D.C. (May 2015)
- [100] *Data-driven learning in dynamic pricing using adaptive optimization*
INFORMS Annual Meeting, San Francisco, CA (Nov. 2014)
- [101] *Data-driven learning in dynamic pricing using adaptive optimization*
Manufacturing Services & Operations Management Conference, Seattle, WA (Jun. 2014)
- [102] *Data-driven learning in dynamic pricing using adaptive optimization*
11th Intl. Conference on Computational Management Science, Lisbon, PT (May 2014)
- [103] *Control and discovery of information in robust optimization*
26th European Conference on Operational Research (invited talk), Rome, IT (Jul. 2013)
- [104] *Decision rules for information discovery in multi-stage stochastic programming*
50th IEEE Conference on Decision and Control, Orlando, FL (Dec. 2011)
- [105] *Decision rules for information discovery in multi-stage stochastic programming*
8th Intl. Conference on Computational Management Science, Neuchâtel, CH (Apr. 2011)
- [106] *Hedging electricity swing options in incomplete markets*
18th IFAC World Congress, Milan, IT (Aug. 2011)
- [107] *Hedging electricity swing options in incomplete markets*
4th Intl. Conference on Computational and Financial Econometrics, London, UK (Dec. 2010)
- [108] *A constraint sampling approach for multi-stage robust optimization*
7th Intl. Conference on Computational Management Science, Vienna, AU (Jul. 2010)

PANELIST

- [109] Panelist for a panel on *Responsible AI*
TED AI 2023 Event, San Francisco (Oct. 2023)
Moderated Thomas Goetz; goal to explore Responsible AI and chart the path forward, grasp fairness, transparency, and accountability principles through real-world case studies
- [110] Panelist for ‘Program Leadership’s Panel’ on *Collaborating with AI in Research*
INFORMS Annual Meeting (Oct. 2023)
- [111] Panelist for *Trade-offs of AI in Social Science with implications for Accuracy, Privacy, Equity*
AAAI Workshop on AI for Behavior Change
AAAI Conference on Artificial Intelligence, virtual (Feb. 2022)
- [112] Panelist for *INFORMS Doctoral Student Colloquium “Job search” panel* (2019, 2020, 2021),
INFORMS Annual Meeting
- [113] Panelist for *Frontiers and potentials of AI techniques in social good domains*
AI for Social Good Symposium organized by Carnegie Mellon University, virtual (Apr. 2020).

- [114] Panelist for INFORMS New Faculty Colloquium *Interdisciplinary Research and Writing Collaborative Grants* panel (2019)
INFORMS Annual Meeting 2019

INTERDISCIPLINARY
WORKSHOP
PARTICIPATION

- *NSF Workshop on the ethical design of AIs (EDAIIs)*, Virtual (Sept.-Oct. 2022)
The goal of this workshop is to explore active human-centered approaches to develop a framework that supports the integration of ethical considerations and constraints into the design of AIs, from the ground up, and starting from an early phase of requirements gathering. The hope is that the human centered active approach, and the early consideration of ethical and social requirements, will have a significant payoff in promoting human well-being.
- *2nd Artificial Intelligence / Operations Research Workshop*, Atlanta, GA (Aug. 2022)
This is an in-person workshop sponsored by the Computing Community Consortium (CCC), the Institute for Operations Research and the Management Sciences (INFORMS) and ACM SIGAI to create a joint vision for fusing the Artificial Intelligence (AI) and Operations Research (OR) communities. This workshop is the second in a three part series which will focus on exploiting the synergies of the AI and OR communities to transform highly scalable, actionable, automated data-driven decision-making.
- *1st Artificial Intelligence / Operations Research Workshop*, Virtual (Sept. 2021)
This is a virtual workshop sponsored by the Computing Community Consortium (CCC), the Institute for Operations Research and the Management Sciences (INFORMS) and ACM SIGAI to create a joint vision for fusing the Artificial Intelligence (AI) and Operations Research (OR) communities. This workshop focuses on exploiting the synergies of the AI and OR communities to transform decision making. The goal of this workshop is to establish a joint strategic vision for AI/OR that will maximize the societal impact of AI and OR.
- *CAIS Symposium on Equity and AI*, University of Southern California, LA (Apr. 2021)
The CAIS Symposium on Equity and AI is intended to be a forum for learning and collaboration among social scientists, computer and data scientists, engineers, service organizations, and community members to begin to understand and ultimately address the ways in which AI systems create, enhance, and perpetuate biases.
- *Algorithmic Ethics: Perspectives from Philosophy and Computer Science*, Virtual (May 2020)
Interdisciplinary workshop jointly organized by the Goergen Institute for Data Science and the Department of Philosophy at the University of Rochester. The workshop brings philosophical discussions of justice, fairness and explainability into conversation with the technical computer science literature.
- *Partnership on AI / IBM Explainability Workshop*, New York, NY (Feb. 2020)
This workshop brings together researchers and industry scientists who have worked on explainability with stakeholders from policy, law, and other Civil Society Organizations to bridge the gap in the existing literature to make the research more helpful at scale
- *Microsoft Research (MSR) India Workshop on AI and Societal Good*
Microsoft Research India, Bangalore, IN (Sept. 2018)
The goal of this workshop is to 1) bring together decision-/policy-makers, academics, NGOs, social enterprises on problems of national importance, and 2) form interdisciplinary working groups who work on these identified problems over the next few months and help create positive impact on lives of people.
- *Microsoft Research (MSR) India Workshop on Artificial Intelligence and Social Good*
Microsoft Research India, Bangalore, IN (Oct. 2017)

The goal of this workshop is to spark interdisciplinary collaborations and concrete projects between researchers and practitioners, including social entrepreneurs, and NGOs.

MEDIA/PRESS
COVERAGE

External

- [yahoo!news](#), “Could artificial intelligence help end homelessness?” (December 2023)
- [VentureBeat](#), “How AI can empower communities and strengthen democracy” (July 2020)
- [livemint](#), “How Artificial Intelligence is progressing in mental healthcare” (Jan. 2020)
- [EurekAlert](#), “Can artificial intelligence help prevent suicides?” (Dec. 2019)
- [Health IT Analytics](#), “Using Artificial Intelligence to Strengthen Suicide Prevention” (Dec. 2019)
- [The Hindu Business Line](#), “AI for Suicide Prevention” (Dec. 2019)
- [Medium](#), “Could A.I. Help Get Homeless Youth Off the Streets?” (Jun. 2019)
- [KCAW](#), “Research team scouts locations for Sitka landslide warning system” (May 2019)
- [NPR Marketplace](#), “As artificial intelligence is used more and more for things like employee recruiting, a look at potential bias” (Jan. 2019)
- [Medical View](#), “Using AI to Fight Substance Abuse” (Sept. 2018)

Internal to USC or to other universities

- [“Phebe Vayanos receives Emerging Alumni Leader Award 2024”](#), Imperial College London (Jan. 2024)
- [“New report combines social work and artificial intelligence to address racial bias in housing for people experiencing homelessness”](#), USC Suzanne Dworack-Peck School of Social Work News (Dec. 2023)
- [“Phebe Vayanos Named Co-Director of USC Center for Artificial Intelligence in Society”](#), Viterbi News (Aug. 2023)
- [“Modeling 3-D Molecules, Fighting Hate Speech, and Addressing Social Problems Using AI: USC Viterbi Faculty and Students Committed to K-12 Outreach”](#), Viterbi News (Jun. 2021)
- [“Nathanael Jo Awarded USC Discovery Prize for 2020-2021”](#), Viterbi News (May. 2021)
- [“Five USC Viterbi Faculty Receive 2021 NSF CAREER Awards”](#), Viterbi News (May. 2021)
- [“Transdisciplinary research team led by USC professors will help Los Angeles reduce bias and disparity in homelessness services”](#), USC News (Jun. 2020)
- [“Can AI Help Prevent Suicides?”](#), USC Viterbi (Dec. 2019)
- [“ISE Research Featured at International Conference on Stochastic Programming”](#), USC Viterbi (Aug. 2019)
- [“Can AI Reduce Race Bias in Homelessness?”](#), USC Viterbi (Oct. 2018)
- [“Research partnership awarded \\$2.1m for landslide prediction project”](#), USC ISE (Oct. 2018)
- [“AI for Social Good”](#), USC Viterbi Magazine (Fall 2018)
- [“AI tool uses positive peer groups to fight substance abuse”](#), USC News (Sep. 2018)
- [“USC Center for AI in Society Seeks to Reduce Military Suicides”](#), USC Viterbi (May 2018)
- [“City of Stars”](#), USC Viterbi Magazine (Fall 2017)
- [“Is There a Better Way to Allocate Organs to Transplant Patients?”](#), KelloggInsight (Dec. 2016)

CAIS Blogposts

- [“Using AI to Optimize Housing Resource Allocation”](#), CAIS Blogpost (Nov. 2019)

TEACHING

COURSES
CREATED OR
DEVELOPED

University of Southern California, Los Angeles, CA

ISE599 Analytics for Social Impact

2022-present

- Created, developed, and taught the course
- Development of this course was supported by my NSF CAREER award
- This course, which is tightly coupled with my research, introduces students to the emerging area of research on *Analytics for Social Impact* whose goal is to advance descriptive, predictive, and prescriptive analytics to address important societal challenges. It exposes the students to applications in e.g., public health, social services provision, and conservation. Particular methods that the students learn about relate to fairness, interpretability, and robustness, from the lenses of optimization, machine learning, and causal inference.

ISE631 Linear Programming

2015-present

- Developed and taught the course
- This is a graduate level class corresponding to the first doctoral course in the field of optimization that serves as the foundation for all subsequent courses in the area
- After six iterations, the class now regularly involves students from Computer Science, Industrial & Systems Engineering, Electrical Engineering, and from the Business School.

COURSES TAUGHT

Note: At USC, 500 level courses and above are graduate level courses. All courses for which I was the main instructor at USC involved 150 minutes per week of in classroom contact hours and one and a half hours per week of office hours on average over 15 weeks, for a total of **60 contact hours per course on average**. Across all the courses I taught at USC, **my average evaluation score as instructor is 4.62/5 (4.618/5 and 4.628/5 for graduate and undergraduate teaching, respectively)**.

University of Southern California, Los Angeles, CA

2015-present

Instructor, *Viterbi School of Engineering*

- ISE599 Analytics for Social Impact, Spring 2022 (18 students)
- ISE330 Introduction to Operations Research: Deterministic Models, Spring 2022 (25 students)
- ISE330 Introduction to Operations Research: Deterministic Models, Spring 2021 (37 students)
- ISE631 Linear Programming, Fall 2020 (9 students)
- ISE330 Introduction to Operations Research: Deterministic Models, Spring 2020 (30 students)
- ISE631 Linear Programming, Fall 2019 (11 students)
- ISE330 Introduction to Operations Research: Deterministic Models, Spring 2019 (36 students)
- ISE631 Linear Programming, Fall 2018 (10 students)
- ISE330 Introduction to Operations Research: Deterministic Models, Spring 2018 (20 students)
- ISE631 Linear Programming, Fall 2017 (16 students)
- ISE330 Introduction to Operations Research: Deterministic Models, Spring 2017 (18 students)
- ISE631 Linear Programming, Fall 2016 (8 students)
- ISE631 Linear Programming, Fall 2015 (9 students)

Guest Lecturer, *Viterbi School of Engineering*

- CSCI697 Seminar in Computer Science Research, Fall 2022
- ISE105 Introduction to Industrial & Systems Engineering, Fall 2021
- CSCI697 Seminar in Computer Science Research, Spring 2021
- CSCI697 Seminar in Computer Science Research, Fall 2019

- CSCI697 Seminar in Computer Science Research, Fall 2018
- CSCI599 Artificial Intelligence for Social Good, Spring 2017
- ISE105 Introduction to Industrial & Systems Engineering, Fall 2016
- ISE105 Introduction to Industrial & Systems Engineering, Fall 2015
- ENGR102 Engineering Freshman Academy, Fall 2015

MIT Sloan School of Management, Cambridge, MA **2014**

Instructor, *Operations Research & Statistics Group*

- 15.093 Optimization Methods, Fall 2014 (68 students)

Guest Lecturer and Teaching Assistant, *Operations Research Center*

- 15.094 Robust Modeling, Optimization & Computation, Spring 2014 (20 students)

Massachusetts Institute of Technology, Cambridge, MA **2013**

Guest Lecturer, *Department of Chemical Engineering*

- 10.557 Mixed-Integer and Non-Convex Optimization (~30 students)

Imperial College London, London, UK **2009-2011**

Guest Lecturer and Teaching Assistant, *Department of Computing*

- CO343 Operations Research (~80 students)

Teaching Assistant, *Department of Computing*

- CO422 Computational Finance (~130 students)

STUDENT
ADVISING

Graduated PhD Students

Aida Rahmattalabi, PhD in Computer Science 22' **2016-2022**

- Joint with Milind Tambe
- Graduated in April 2022
- Internship at Stanford University RegLab
- Internship at Sony AI under Alice Xiang (Senior Research Scientist at Sony AI and Head of AI Ethics Office at Sony Group)
- First position: Sony AI

Sina Aghaei, PhD in Industrial & Systems Engineering 23' **2017-2023**

- Recipient of USC Viterbi Graduate Student Fellowship
- Passed his screening exam in Sept. 2018
- Passed his qualifying exam in Mar. 2021
- Internship at Snap. Inc (summer 2022)
- USC Viterbi 2nd Annual 3 Minute Thesis Contest, Finalist, 3rd place (fall 2023)
- Defended his thesis in Dec. 2023
- First position: Postdoctoral Researcher at Harvard University Public Impact Analytics Science Lab (PIAS-Lab)

PhD Students: currently advising 6 PhD students (5 from ISE, 1 from CS)

Qing Jin, PhD student in Industrial & Systems Engineering **2019-present**

- Passed her qualifying exam in Jan. 2024
- Internship at Barclays Services Corporation (summer 2023)
- Elected CAIS Student Leader (2021-2022)
- Passed her screening exam in Aug. 2020
- Recipient of USC ISE Daniel J. Epstein Fellowship

Caroline M. Johnston, PhD student in Industrial & Systems Engineering **2019-present**

- Amazon SCOT/INFORMS Scholarship, Fall 2023
- EAAMO 2023 Doctoral Consortium Award, Fall 2023
- WORMS Doctoral Student Colloquium Award, Fall 2022
- Elected CAIS Student Leader (2021-2022)
- Passed her screening exam in Aug. 2020
- Recipient of NSF Graduate Research Fellowship (GRFP) 2021
- Recipient of USC Viterbi School of Engineering/Graduate School Fellowship
- Internship at HP (summer 2022)
- Internship at IBM (summer 2023) under Kush Varshney (distinguished research scientist and manager with IBM Research at the Thomas J. Watson Research Center)
- Passed her qualifying exam in Dec. 2023

Yingxiao Ye, PhD student in Industrial & Systems Engineering **2019-present**

- Passed his screening exam in Aug. 2020
- Best Presentation Award from the International Conference on Conservation Biology 2022
- Internship at Wayfair Llc (summer 2023); job offer from Wayfair Llc starting Aug. 2025
- Passed his qualifying exam in Dec. 2023

Nathan Justin, PhD student in Computer Science **2020-present**

- Elected CAIS Student Leader (2022-2023)
- Recipient of NSF Graduate Research Fellowship (GRFP) 2022
- Recipient of USC Viterbi Graduate Student Award, Best RA 2022
- Passed his qualifying Exam in Oct. 2023

Bill Tang, PhD student in Industrial & Systems Engineering **2020-present**

- Passed his screening exam in Aug. 2021
- Recipient of NSF Graduate Research Fellowship (GRFP) 2022
- Passed his qualifying exam in Dec. 2023

Qingshi Sun, PhD student in Industrial & Systems Engineering **2022-present**

- Passed his screening exam in Aug. 2023

Graduated Undergraduate Students

Christopher Doehring, undergraduate student in Industrial & Systems Engineering **2018–2022**

- Recipient of Viterbi Fellows Merit Research Assistantship
- Funded on NSF REU since Feb. 2020
- INFORMS Undergraduate Research Paper Prize Finalist 2020
- USC ISE Undergraduate Research Award 2022
- First position after graduation: PhD student at University of Michigan Ann Arbor, Industrial & Operations Engineering program

Jack Benson, undergraduate student in Industrial & Systems Engineering **Spring 2021**

Nathanael Jo, M.S. Applied Data Science, B.S. Applied Math., BA Data Science **2020-2021**

- First position: Research Fellow at Stanford RegLab
- INFORMS Undergraduate Operations Research Prize Award 2021, Finalist
- Won the USC University-wide Discovery Scholar Prize Competition (includes \$10,000 prize to attend PhD program)
- Earned the USC Discovery Scholar distinction for his first author paper on “Learning optimal prescriptive trees from observational data”
- Funded through award from USC ISE Epstein Institute since Jan. 2021

David Desai, undergraduate student in Industrial & Systems Engineering **Summer 2019**

- Funded through Viterbi Summer Research support

Boyuan (Caroline) Liu, undergraduate student in Industrial & Systems Engineering **2016-2018**

- Recipient of WiSE Researcher Grant (\$4,000) to conduct research under my supervision

Kathryn Dullerud, B.S. in Economics/Mathematics **2019-2023**

- First position: Master’s in Statistics at EPFL
- INFORMS Undergraduate Scholar, Fall 2022
- Recipient of USC Provost’s Research Fellowship, Fall 2020, Summer 2021
- Funded on NSF REU Supplements since Jan. 2022
- Voted Audience Choice Presentation at Viterbi Summer Research Student Showcase 2020 for her talk titled “A case study on the performance of housing allocation policies among people experiencing homelessness”

Shreyas Narayanan, B.S. Data Science and Applied & Computational Math. **Spring 2022**

CAIS Summer Fellows

Duncan McElfresh, PhD student, Applied Mathematics, University of Maryland **2018-2019**

Naveena Karusala, PhD student, Computer Science, University of Washington **Summer 2018**

Jennifer Wilson, PhD student, Social Work, University of Denver **Summer 2018**

Hau Chan, Postdoctoral Research Associate, Trinity University **Summer 2017**

Visiting Students & Graduates

Han Kyul Kim, PhD student in Industrial & Systems Engineering **Summer 2022**

Patrick Vossler, PhD student at USC Marshall School of Business **2021-2023**

- First position: postdoctoral researcher at the Regulation, Evaluation, and Governance Lab (RegLab) at Stanford Law School

Nathanael Jo, RegLab, Stanford **2021-2023**

- First position: PhD at MIT Computer Science

Simon Blessenhohl, Graduated with PhD from USC School of Philosophy **2020-present**

Sulagna Mukherjee, PhD student in Computer Science **2019**

Omkar Thakoor, PhD student in Computer Science, joint with Milind Tambe **2017-2019**

Han Yu, PhD student in Industrial & Systems Engineering **2018-2019**

Javad Azizi, PhD student in of Industrial & Systems Engineering **Fall 2017**

Graduated Masters’ Students

Rubina (Iman) Kabir, M.S. in Applied Data Science **Summer 2020**

Dhruv Mathew, M.S. in Computer Science, Data Science **2020**

Aditya Chandupatla, M.S. in Computer Science, Data Science	2019-2020
Jeffy Jacob, M.S. in Computer Science, Data Science	2019
Aayush Sinha, M.S. in Data Informatics	2018
Camilo Barrera, M.S. in Operations Research Engineering	2018
Jing Zheng, M.S. in Operations Research Engineering	2017

Current Masters' Students

John Dryden, M.S. Operations Research Engineering	Summer 2022
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Please turn over.

SERVICE

PROFESSIONAL SERVICE

Editorial Positions

- Associate Editor for *Operations Research* “Optimization” area **Jan. 2024-Dec. 2026**
- Associate Editor for *Operations Research* “Real World OR Innovations” **Jan. 2024-Dec. 2026**
- Associate Editor for *TOP* **2023-present**
The official journal of the Spanish Society of Statistics and Operations Research
- Associate Editor for *Operations Research Letters* **2021-present**
Optimization under Uncertainty and Machine Learning area
- Associate Editor for *Computational Management Science* **2020-present**

Officer Positions

- Elected Chair of the Committee on Stochastic Programming (COSP), **2023-2025**
the governing body of the Stochastic Programming Society
- INFORMS Public Sector Operations Research (PSOR) Society Officer **2021,2022**
VP of Communications
- Elected Member of the Committee on Stochastic Programming (COSP), **2019-2023**
the governing body of the Stochastic Programming Society
- Member of ad hoc INFORMS AI Strategy Advisory Committee **2019, 2021**

The committee is a source of expertise and advice to the INFORMS President, Board, and relevant Committees; we have been charged to help the INFORMS President and Board develop a good understanding of the scope of AI and to provide input that will help the Board make strategic decisions to help INFORMS thrive in a world where AI is an important national priority

Summer Program Organizer

- Co-Organizer of USC Center for AI in Society Summer Fellowship Program (2017, 2018)

Conference Leadership

- Co-chair of ‘Data-Driven Optimization’ stream at International Symposium on Mathematical Programming (ISMP 2024), Montréal, Canada
- Local organization committee member, 8th International Conference on Continuous Optimization (ICCOPT 2025), USC, Los Angeles, CA
- Organizer of pre-conference tutorial on “End-to-end learning / contextual stochastic optimization” at 2023 International Conference on Stochastic Programming (ICSP), UC Davis, CA
- Co-chair of 2023 International Conference on Stochastic Programming (ICSP), UC Davis, CA
- Co-chair for the CPAIOR 2022 conference, Los Angeles, CA
- DEI Chair for the CPAIOR 2022 conference, Los Angeles, CA:

Conceived and co-organized the first CPAIOR mentorship event, which pairs students with senior researchers in the community to get advice and guidance and to forge long lasting relations

- Co-chair for INFORMS Optimization Society meeting (IOS2022) “Optimization under Uncertainty” track, Greenville, SC
- Co-Chair at CORS (Canadian OR Society) 2021 for the newly launched “OR and Social Good” cluster, virtual event
- Chair for the INFORMS 2019 Policy & Government cluster under Emerging Topics, Seattle, WA
- International Scientific Committee Member for International Conference on Stochastic Program-

ming (ICSP) 2019, Trondheim, NOR

- Organizer and Chair of Mini-Symposium on *Doing Good with Good RO* at International Conference on Stochastic Programming (ICSP) 2019, Trondheim, NOR
- Co-organizer of Master Class on *CP, AI, and OR for Social Good* at CPAIOR 2019 Thessaloniki, GR
 - Organized a master class on the integration of Constraint Programming, Artificial Intelligence, and Operations Research for Social Good, bringing together research leaders in the field to share their work with other researchers and PhD students
- Organization committee member for the 2017 CNSL Conference on Nonconvex Statistical Learning, Los Angeles, CA
- Local organization committee member for the 9th International Conference on Computational Management Science, London, UK, 2012

Workshop Organizer

- Co-organizer of 2023 Workshop on *Artificial Intelligence and Operations Research* sponsored by Computing Community Consortium (CCC)
- Co-organizer of 2021 Workshop on *Artificial Intelligence and Operations Research* sponsored by Computing Community Consortium (CCC), INFORMS, and SIGAI
- Co-organizer of 2021 CAIS Workshop on *AI and Equity*
- Co-organizer of 2017 CAIS Symposium *AI for Social Good: Setting the Agenda*, Los Angeles, CA

Invited Session Chair/Co-Chair

- Session on *Interpretability, Fairness and Robustness in OR/ML*
INFORMS 2022, Indianapolis, IN
- Session on *Decision-making under endogenous uncertainty*
INFORMS 2022, Indianapolis, IN
- Session on *Robust optimization for machine learning*
INFORMS Annual Meeting 2021, Anaheim, CA
- Session on *Ethics in analytics*
EURO 2021, Athens, GR
- Session on *Robustness, interpretability, and fairness in decision-making for social good*
CORS (Canadian OR Society) 2021, Toronto, CA
- Session on *Optimal Decision Trees*
EURO Conference, Athens, GR, 2021
- Session on *Robust optimization under endogenous uncertainty: theory, computation, and social good applications*, INFORMS Annual Meeting 2020, virtual
- Two sessions on *Data-driven and robust optimization*
INFORMS Annual Meeting 2018, Phoenix, AZ
- Session on *Data-driven and robust optimization*
International Symposium on Mathematical Programming (ISMP) 2018, Bordeaux, FR
- Two sessions on *Data-driven and robust optimization* : one session in the Optimization under Uncertainty cluster, one session sponsored by the Computing Society, 2017
INFORMS Annual Meeting 2017, Houston, TX
- Session on *Data-driven and robust optimization* session
Computational Management Science (CMS) conference, Bergamo, IT, 2017
- Session on *Theory and Applications of Robust Optimization*
INFORMS Annual Meeting 2014, San Francisco, CA

- Session on *Financial and Economic Applications of Game Theory and Optimal Control*
18th IFAC World Congress 2011, Milan, IT
- Session on *Risk Management*
4th CSDA International Conference on Computational and Financial Econometrics 2010, London, UK

Conference Senior Program Committee Member

- 2021 AAAI Conference on Artificial Intelligence, Special Track on AI for Social Impact, virtual
- 2020 AAAI Conference on Artificial Intelligence, New York, NY
- 2020 AAAI Conference on Artificial Intelligence, Emerging Track on AI for Social Impact, New York, NY

Conference Program Committee Member

- 2021 Conference on Principles and Practice of Constraint Programming (CP), Montpellier, FR
- 2020 ACM Conference on Economics and Computation (EC), Budapest, HU
- 3rd workshop on Mechanism Design for Social Good (MD4SG) held at EC 2019 in Phoenix, AZ
- First ACM SIGCAS Conference on Computing and Sustainable Societies (ACM COMPASS)

Proposal Reviewer / Panelist

- Panelist for the NSF Graduate Research Fellowship Program (GRFP) for Computer and Information Science and Engineering (CISE), 2020
- Ad hoc reviewer for the NSF DCL on *Disrupting Operations of Illicit Supply Networks*, 2019
- Panelist for the NSF Service, Manufacturing, and Operations Research (SMOR) Program, Unsolicited proposal panel, Optimization area, 2016

Judge for Paper and Poster Competitions

- Judge for the 2022 JFIG (Junior Faculty Interest Group) Paper Competition
- Judge for the 2019 INFORMS Poster Session
- Judge for the 2019 INFORMS Health Application Society Student Paper Competition
- INFORMS Nicholson Prize committee member (2018-2019)
- Chair for one of the Nicholson prize sessions at the INFORMS Annual Meeting 2018

Reviewer

- *Management Science*
- *Operations Research*
- *INFORMS Journal on Computing*
- *INFORMS Journal on Optimization*
- *Mathematical Programming*
- *SIAM Journal on Optimization*
- *Mathematics of Operations Research*
- *Journal of Optimization Theory and Applications*
- *Healthcare Management Science*
- *Annals of Operations Research*
- *European Journal of Operational Research*
- *Computers & Operations Research*
- *Automatica*
- *Journal of Global Optimization*
- *Energy Systems*

- *Computational Management Science*
- *Proceedings of 18th IFAC World Congress*
- *Optimal Financial Decision Making under Uncertainty*
- *Journal of Petroleum Science and Engineering*
- *IFAC Conference on Manufacturing Modeling, Management and Control*

Tutorials

- 2022 CORS / INFORMS International Conference, Vancouver, BC (Jun. 2022)
- CORS 2021 Annual Conference of the Canadian Operational Research Society (Jun. 2021)
- CPAIOR 2019 Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research, Thessaloniki, Greece (Jun. 2019)
- Doctoral Consortium on Computational Sustainability 2017
University of Southern California, Los Angeles, CA (Jul. 2017)

Other

- Mentor for the CPAIOR 2022 student mentorship event
- Panelist for INFORMS Doctoral Student Colloquium *Job search* panel (2019, 2020, 2021)
- Panelist for INFORMS New Faculty Colloquium *Interdisciplinary Research and Writing Collaborative Grants* panel (2019)
- INFORMS Optimization Society mailing list moderator (2016)
- Member of INFORMS
- Member of MOS
- Member of AAAI

UNIVERSITY
SERVICE

University of Southern California, Los Angeles, CA

University Level

- University Research Committee, member (2023-2024)

The Research Committee will explore how Artificial Intelligence (AI) can be used to enhance research at USC. Topics the committee will likely consider are how AI can be used to enhance research productivity, discovery and innovation at the university. Other topics to consider are the key challenges and risks posed by AI. The committee will draft an action plan for USC to leverage AI effectively in the next 2-3 years to increase its research impact. The plan will include recommendations on how USC can increase access to state-of-the-art computing resources, train faculty and PhD students in AI-enabled technologies and encourage collaboration across schools and units in order to continue its ascent as one of the world's premier research universities.

- PhD Qualifying Exam Committee Member (non-Viterbi)
Laura Petry (USC SW, 2021), Justin Mulvaney (Marshall, 2020)
- PhD Committee Member (non-Viterbi)
Justin Mulvaney (Marshall, 2021), Negin Golrezaei (Marshall, 2017)

Viterbi School of Engineering

- Viterbi Research Committee member (2018-2019)
- PhD Qualifying Exam Committee Member
Tianjian Huang (ISE, 2023), Ninareh Mehrabi (CS, 2022), Laura Petry (USC SW, 2021), Justin Mulvaney (Marshall, 2020), Shichun Hu (ISE, 2020), Ninareh Mehrabi (CS, 2020),

Aaron Farber (CS, 2020), Nazanin Alipourfard (CS, 2020), Dhruva Kartik Mokhasunavisu (EE, 2020), Shiva Nahabi (EE, 2019), Kai Wang (CS, 2019), Elizabeth Bondi (CS, 2018), He Luan, Ye Wang, Siyuan Song (ISE, 2017), Sara McCarthy (CS, 2017), Abdullah Alibrahim (ISE, 2015)

- PhD Committee Member

Rajat Tandon (CS/ISI, 2022), Shuotao Diao (ISE, 2022), Shichun Hu (ISE, 2021), Dhruva Kartik Mokhasunavisu (EE, 2021), Justin Mulvaney (Marshall, 2021), Alipoufard Nazanin (CS, 2020), Shiva Nahabi (EE, 2020), Yang Cao (ISE, 2018), Sara McCarthy (CS, 2018), Ye Wang, Siyuan Song (ISE, 2018), Debarun Kar (CS, 2017), Negin Golrezaei (Marshall, 2017)

CAIS Center for AI in Society

- Co-Director of USC CAIS (2023-present)
- Associate Director of USC CAIS (2016-2023)
- Organizer of CAIS Seminar Series (Spring 2017, Spring 2018, Fall 2018, Fall 2019, Spring 2020, Fall 2020)
- Member of Diversity, Equity, and Inclusion Committee (2020)
- CAIS Summer Fellowship Program co-organizer (2017, 2018)

Department of Industrial & Systems Engineering

- PhD Admissions Committee Member (2015, 2016, 2018, 2022); Proposed and executed buddy system and open house poster session that doubled acceptance rates of admitted students
- Member of Diversity, Equity, and Inclusion Committee (2021)
- Committee Member for the development of an action plan for sustained excellence for the department (2020) which helped raise a \$14M gift for the department
- Committee Member for the design of the Masters' in Analytics program (2015)

OUTREACH &
OTHER
EDUCATION

- [1] *ExplOR Event*
 - Organized the second iteration of the ExplOR event for high school students (Dec. 2021)
 - Organized ExplOR, a day-long program aimed to bring STEM education to underserved communities, focusing on topics in Operations Research (OR) and Artificial Intelligence (AI) applied to problems of Social Good in collaboration with educators, staff, and students at Code in the Schools and STEM Academy of Hollywood (Nov. 2020)
- [2] *Housing allocation for homeless persons: fairness, transparency, and efficiency*
 - USC PhD REACH Program 2020, virtual presentation to prospective domestic PhD students attending Historically Black Colleges and Universities as well as Hispanic Serving Institutions
- [3] *How can artificial intelligence mitigate homelessness?*
 - Los Angeles Unified School District (LAUSD) Computer Science Zoom Series (Sept. 2020) ~150 middle and high school students of LAUSD's Linked Learning Pathway
- [4] *Assisting vulnerable communities through artificial intelligence and operations research*
 - 2020 IISE Western Regional Conference, The New Age of Analytics (Feb. 2020)
- [5] *Assisting vulnerable communities through artificial intelligence and operations research*
 - Santa Monica Rotary Club (Jan. 2020)

- [6] *AI and Operations Research for mitigating homelessness*
 - Open Data Science Conference (ODSC) West, San Francisco, CA (Nov. 2019)
- [7] *Housing allocation for homeless persons: fairness, transparency, and efficiency*
 - AIRES Conference: An Ex-Ante Approach on Ethics in Artificial Intelligence, hosted by the AI Robotic Ethics Society, a UCLA organization on a mission to ensure artificial intelligence is designed ethically and responsibly, Los Angeles, CA (Jun. 2019)
- [8] *Introduction to the Center for AI in Society*
 - USC STEM Spotlight for high school students from the STEM Academy of Hollywood, Los Angeles, CA (Mar. 2019)
- [9] *Assisting low resource communities via data-driven optimization*
 - USC WiSE Research Horizons Symposium, Los Angeles, CA (Mar. 2019)
- [10] *Panel on “Fairness, accountability, and transparency” and Talk on “Fairness, accountability, and transparency in AI for allocating housing to the homeless”*
 - AI LA Meet-up on “AI and Society: Creating a Fair and Ethical Future,” Innovate Pasadena Connect Week, Pasadena, CA (Oct. 2018)
- [11] *Meet an Engineer Here! (Conozca una Ingeniera Aqui!)*
 - 3rd Annual LAUSD Local District East Family College and Career Day fair, Los Angeles, CA (May 2018)
- [12] *Improving Medical Decision-Making using Data, Math, and Computers*
 - Mirman School Women in STEAM Conference 2017, Los Angeles, CA (invited talk, Mar. 2017)
- [13] *Data-driven decision-making in healthcare*
 - USC Bridge Faculty Luncheon Seminar (invited talk), Los Angeles, CA (Mar. 2017)
- [14] *Engineering better decisions in healthcare*
 - USC WiSE STEM Bytes Seminar (invited talk), Los Angeles, CA (Nov. 2016)

CORPORATE
EXPERIENCE

BP Plc.

Field of the Future Flagship, Decision Analytics
Consultant

2013-2015

- Data-driven waterflood optimization

Conversion Technology Center, Refining & Marketing, Research & Tech.
Consultant

2012–2013

- Gasoline blend planning under uncertainty

MIT Sloan School of Management, Cambridge, MA

2013–2015

Executive MBA Program
Consultant

- Automated decision-support for team formation and project allocations
- Employed by the MIT Sloan School of Management Action Learning Labs since 2013

BNP Paribas, London, UK **2008–2009**
Corporate & Investment Bank
Contractor, Portfolio Optimization Team, Fixed Income Structuring

- Risk management advisory for corporate clients

JPMorgan Chase & Co., London, UK **2007–2008**
Worldwide Securities Services
Graduate, Business Unit Relationship Management, Global Custody Technology

- Facilitated communication between technical project managers and product managers, tracked project progress, assisted on project prioritization, budget and resource allocation

LANGUAGES Greek (mother tongue), French (native), English (fluent), Spanish (intermediate) and German (basic)

COMPUTER SKILLS

- Programming languages: C++, C#, VBA
- Scientific computing/Analytics: MATLAB, R, RStudio
- Mathematical modeling: IBM CPLEX, GUROBI, MOSEK, Yalmip