AI and Optimization for Social Good

Abstract - In the last decades, significant advances have been made in AI and optimization. Recently, systems relying on these technologies are being transitioned to the field with the potential of having tremendous positive influences on people and society. With increase in the scale and diversity of deployment of AI- and optimization-driven algorithms in the open world come several challenges including the need for tractability and resilience, issues of data scarcity and bias, information endogeneity, ethical considerations, and issues of shared responsibility between humans and algorithms. In this talk, we focus on problems in public health, homeless services provision, and biodiversity conservation, and present research advances in AI and optimization to address one key cross-cutting question: how to effectively allocate scarce intervention resources in these domains while accounting for the challenges of open world deployment and for the needs of the stakeholders? We will show concrete improvements over the state of the art in these domains based on real world data and discuss steps we are taking to deploy these algorithms in the field to yield direct benefits for vulnerable communities. We are convinced that, by pushing this line of research, AI and optimization can play a crucial role to help fight injustice and solve complex problems facing our society.

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SPEAKER BIO – Phebe Vayanos is an Assistant Professor of Industrial & Systems Engineering and Computer Science at the University of Southern California. She is also an Associate Director of CAIS, the Center for Artificial Intelligence in Society, an interdisciplinary research initiative between the schools of Engineering and Social Work at USC. Her research is focused on Artificial Intelligence and Operations Research and in particular on optimization, machine learning, and game theory. Her work is motivated by problems that are important for social good, such as those arising in public housing allocation, public health, and biodiversity conservation. Prior to joining USC, she was lecturer in the Operations Research and Statistics Group at the MIT Sloan School of Management, and a postdoctoral research associate in the Operations Research Center at MIT. She holds a PhD degree in Operations Research and an MEng degree in Electrical & Electronic Engineering, both from Imperial College London. She serves as a member of the ad hoc INFORMS AI Strategy Advisory Committee and is an elected member of the Committee on Stochastic Programming (COSP). She is a recipient of the INFORMS Diversity, Equity, and Inclusion Ambassador Program Award.

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