Northwestern | McCORMICK SCHOOL OF ENGINEERING
Center for Engineering and Health

CEH SEMINAR: DR. PHEBE VAYANOS

Learning Policies for Allocating Scarce Housing Resources to People Experiencing Homelessness

HOST: DR. SANJAY MEHROTRA

We study the problem of allocating scarce housing resources of different types to individuals experiencing homelessness based on their observed covariates. We leverage administrative data collected in deployment to design an online policy that maximizes mean outcomes while satisfying budget and fairness requirements. We propose a policy in which an individual receives the resource maximizing the difference between their mean treatment outcomes and the resource bid price, or roughly the opportunity cost of using a resource. Our approach has nice asymptotic guarantees and is easily interpretable. We show results on real data from the Homeless Management Information System in LA: our policies improve rates of exit from homelessness by 1.2% and policies that are fair in either allocation or outcomes by race come at very low price of fairness. In addition, to help guide the discussion among stakeholders in deciding on appropriate fairness requirements to impose when allocating scarce resources, we propose a framework for evaluating fairness in such resource allocation systems and present a set of incompatibility results that investigate the interplay between them.

BIOGRAPHY

Phebe Vayanos is a WiSE Gabilan 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 at USC. Her research is focused on Operations Research and Artificial Intelligence and in particular on optimization and machine learning. 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 has served as a member of the ad hoc INFORMS AI Strategy Advisory Committee and as VP of Communications for the INFORMS Section on Public Sector Operations Research. She is an elected member of the Committee on Stochastic Programming (COSP) and an Associate Editor for Operations Research Letters and Computational Management Science. She is a recipient of the NSF CAREER award and the INFORMS Diversity, Equity, and Inclusion Ambassador Program Award.

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RSVP