Industrial & Systems Engineering
Seminar Announcement

# Optimization and Analytics for Social Good

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**Abstract:** In the first part of the talk, we provide an overview of recent and ongoing work in the public health domain. Specifically, we propose a social network based approach for preventing drug abuse among homeless youth, a robust optimization technique for preventing suicide among freshmen, and a mixed integer optimization approach for designing fair, efficient, and interpretable policies for allocating scarce resources (e.g., kidneys for transplantation, houses for homeless youth).

In the second part of the talk, we focus on a specific project. We present a data-driven optimization approach to estimate wait times for individual patients in the U.S. Kidney Allocation System, based on the very limited system information that they possess in practice. To deal with this information incompleteness, we develop a novel robust optimization analytical framework for wait time estimation in multiclass, multiserver queuing systems. We calibrate our model with highly detailed historical data and illustrate how it can be used to inform medical decision making and improve patient welfare.

The first part of the talk is joint work with Milind Tambe, Eric Rice, and our students and fellows of the Center for AI in Society. The second part of the talk is joint work with Chaitanya Bandi and Nikolaos Trichakis.

**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 the CAIS Center for Artificial Intelligence in Society at USC. Her research interests include optimization under uncertainty, data-driven optimization and analytics, artificial intelligence, and machine learning. Her research is motivated by real problems that are important for society. 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.

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**1:30 – 2:20 p.m.**
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