



Operations Research and Engineering Management Seminar Series

Research Seminar

Inverse Optimization for Imputing Constraints in Mathematical Programs



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Friday, November 10th
11:00am - 12:15pm
Caruth 383

Abstract: In a typical (forward) optimization problem, a decision-maker uses given values of model parameters to compute the values of decision variables. The goal in inverse optimization (IO) is instead to infer parameters that render given values of decision variables optimal. Most papers on IO utilize duality to impute objective function parameters. A corresponding literature for imputing constraint parameters is essentially non-existent, even for linear programs. The difficulty is that these IO problems include nonconvex bilinear constraints and/or objectives. We will discuss models and solution algorithms designed to tackle these difficult problems. We will illustrate key ideas through the motivating problem of imputing transition probabilities in Markov decision processes (MDPs). If time permits, we will also extend these ideas to inverse semi-definite programs (SDPs) and inverse Quadratic Programs (QPs), where matrices on the left-hand-sides of constraints are unknown.

Biography: Archis is a Professor of Industrial Engineering and holds the Fluor Endowed Chair at Clemson University. Prior to joining Clemson, he was a Professor of Industrial & Systems Engineering

at the University of Washington in Seattle. There he served as the Associate Chair for six years and held a College of Engineering Endowed Professorship for five years. He joined the University of Washington as an Assistant Professor in 2006 after receiving a PhD in Industrial and Operations Engineering from the University of Michigan in 2006, and an MS in Management Science and Engineering from Stanford in 2003. He completed his undergraduate education at the Indian Institute of Technology, Bombay in 2001. Archis is a recipient of the NSF CAREER award and the award for excellence in teaching Operations Research from IISE. He has also received multiple teaching accolades from the University of Washington. His students have won the Dantzig dissertation award, and the Bonder scholarship in healthcare operations research from INFORMS. Archis has served on the editorial boards of several journals. He was the General Chair of the INFORMS 2019 Annual Meeting, and a Program Co-Chair of the 2021 IISE Annual Conference.