

Computer and  
Information Science

Fachbereichs-  
kolloqium

Summer semester 2024

***The Role of Convexity in Learning: An Inverse Optimization Case Study***

Speaker and Title

Peyman Mohajerin Esfahani (TU Delft)

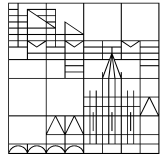
<https://www.dcsc.tudelft.nl/~mohajerin/index.html>

Time and Room

June 5th (Wednesday)

1:30pm - 3:00pm

ZT 1204 (Data Theatre)



## Abstract

In this talk, we first briefly review a general class of data-driven decision-making and highlight the role of convexity in addressing three research questions that arise in this context. We then focus on a particular setting of such problems known as inverse optimization (IO) where the goal is to replicate the behavior of a decision-maker with an unknown objective function. We discuss recent developments in IO concerning convex training losses and optimization algorithms. The main message of this talk is that IO is a rich supervised learning model that can capture a complex (e.g., discontinuous) behavior while the training phase is still a convex program. We motivate the discussion with applications from control (learning the MPC control law), transportation (the 2021 Amazon Routing Problem Challenge), and robotics (comparison with the state-of-the-art in the MuJoCo environments).

## Speaker's Bio

Peyman Mohajerin Esfahani is an associate professor at the Delft Center for Systems and Control. He joined TU Delft in October 2016 as an assistant professor. Prior to that, he held several research appointments at EPFL, ETH Zurich, and MIT between 2014 and 2016. He received the BSc and MSc degrees from Sharif University of Technology, Iran, and the PhD degree from ETH Zurich. He currently serves as an associate editor of Transactions on Automatic Control, Mathematical Programming, Operations Research, and Open Journal of Mathematical Optimization. He was one of the three finalists for the Young Researcher Prize in Continuous Optimization awarded by the Mathematical Optimization Society in 2016, and a recipient of the 2016 George S. Axelby Outstanding Paper Award from the IEEE Control Systems Society. He received the ERC Starting Grant and the INFORMS Frederick W. Lanchester Prize in 2020. He is the recipient of the 2022 European Control Award.