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TOWARDS INTRINSICALLY EXPLAINABLE CLUSTERING ALGORITHMS

Abstract: As machine learning has become more prevalent in society in recent years, the need for trustworthy models that stakeholders can audit has increased dramatically. In particular, one desirable aspect of trustworthiness in ML is that the approaches utilized are constrained so that their predictive mechanisms are innately explainable to humans. Cluster analysis is a fundamental task aims to uncover meaningful groups within data, with many high-stakes applications. Despite the growing interest in explainability in ML, relatively limited work has focused on explainable clustering and most clustering algorithms do not provide any explanation of the obtained partition, requiring post-hoc analysis to characterize the clusters. In this talk, I will describe recent work on clustering algorithms that construct explainable mappings from samples to clusters. We will discuss deep neural approaches, as well as approaches based on combinatorial optimization, to construct such mappings. We will also consider the ability to use clustering constraints to incorporate domain knowledge and improve clustering accuracy and present insight into the trade-off between explainability and the satisfaction of such constraints.

Biography: Eldan Cohen is an Assistant Professor of Industrial Engineering at The University of Toronto and the director of the Optimization and Machine Learning (OptiMaL) Lab. His research interests include machine and deep learning, heuristic search and optimization, and natural language processing, with an emphasis on human compatible approaches. In addition, he has worked on applications of these techniques in various domains such as healthcare, manufacturing, and autonomous agents. He completed his PhD at the Department of Mechanical and Industrial Engineering at the University of Toronto and was a postdoctoral fellow at the department of Computer Science and the Vector Institute for Artificial Intelligence.

Zoom: <https://ulaval.zoom.us/j/69609873335?pwd=x829S4e6lbfuOEdJOC9wGbOJaj5tS4.1>
Meeting ID: 696 0987 3335 - Passcode: 198635

VENDREDI
28 novembre 2025
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Université Laval
Pavillon Palasis-Prince
Salle 1307

Ouvert à tous
Café et viennoiseries

Responsables:
Pierre Miasnikof / Michael Morin