Plenary Talks

Accelerating innovation and discovery through analogy mining
Dafna Shahaf

Abstract: Large repositories of products, patents and scientific papers offer an opportunity for building systems that scour millions of ideas and help users discover inspirations. However, idea descriptions are typically in the form of unstructured text, lacking key structure that is required for supporting creative innovation interactions. In this talk, we will discuss several recent works that explore how to support creative innovation with analogies and idea representations. We propose novel representations that automatically extract different kinds of useful structure from idea descriptions, and demonstrate how these representations can be used to support creative tasks such as ideation, functional search for ideas, and exploration of the design space around a focal problem.

Short Biography: Dafna Shahaf is an Associate Professor in computer science at the Hebrew University of Jerusalem. Prof. Shahaf's research uses digital traces of human activity to better understand human capacities such as humor and creativity, and to develop computer systems that can support these capacities. She received her PhD from Carnegie Mellon University, and was a postdoctoral fellow at Stanford University and at Microsoft Research. Prof. Shahaf has won multiple awards, including best research paper awards at KDD 2010 and KDD 2017, an ERC starting grant, IJCAI Early Career Award. a Microsoft Research Fellowship, a Siebel Scholarship, Wolf's Foundation Krill Award, as well as MIT Tech Review's "Most thought-provoking paper of the week".

Similarity measures at the core of analogical transfer and case-based prediction

Marie-Jeanne Lesot

Abstract: Case-based prediction applies the plausible inference principle of analogical transfer, according to which if two cases are similar with respect to some criteria, in particular in the situation space, then it is plausible that they are also similar with respect to other criteria, in particular in the outcome space. In a first part, the presentation will review some existing approaches to case-based prediction, distinguishing them according to the type of knowledge used to measure the compatibility between the two sets of similarity relations. In a second part, the presentation will discuss the very notion of similarity measure, highlighting their variety both for numerical and categorical descriptive features. It will finally present some equivalence results that allow to define a reduced number of similarity families, providing some guidance for their selection.

Short Biography: Marie-Jeanne Lesot is an associate professor in the Computer Science Lab of Sorbonne Université, LIP6, and a member of the Learning and Fuzzy Intelligent systems (LFI) group. Her research interests focus on fuzzy machine learning with an objective of data interpretation and semantics integration, within the eXplainable Artificial Intelligence framework; they include similarity measures, fuzzy clustering, linguistic summaries and information scoring. She is also interested in approximate reasoning and the use of non classical logics, in particular weighted variants with increased expressiveness that are close to natural human reasoning processes.