Computer Science Seminar

Declarative Learning-based Programming for Learning and Reasoning over Spatial Language

Parisa Kordjamshidi, PhD
Tulane University

Abstract: The recent research results in Natural Language Understanding (NLU) and other problem domains show that monolithic deep learning models trained on merely large volumes of data suffer from lack of interpretability and generalizability. For NLU, we often need computational models that involve multiple interdependent learners, along with significant levels of composition and reasoning based on additional knowledge beyond available data. NLU requires pragmatics and common sense reasoning on top of syntactic and semantic information. Conventional programming paradigms offer no help in developing such complex learning-based models. In this talk, I discuss two themes of my research. One theme is the declarative learning-based programming (DeLBP) paradigm that aims at facilitating the design and development of complex intelligent systems. The other theme is an important NLU problem of spatial language understanding. Spatial language conveys the information about the location/translocation of objects and their spatial relationships. This semantics is relevant for visualization and grounding language into the real-world. I demonstrate how DeLBP framework facilitates working with structured data from heterogeneous resources (vision and language), considering domain knowledge and spatial ontologies in learning, and designing various learning and inference configurations. This paradigm helps to move towards integrating learning and reasoning and exploiting both symbolic and sub-symbolic representations for solving complex and AI-complete tasks.

Monday, February 25, 2019, 10:00 am
TBD