Machine Learning and Natural Language Processing  
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Abstract: Machine learning plays a vital role in modern natural language processing (NLP), enabling the construction of robust machine translation, speech recognition, and question answering systems.  An underdeveloped but critical component required for further advancing the state-of-the-art is semantics, a topic that has been receiving increasing attention.  In this talk, I will first give an overview of various semantic models and the linguistic phenomena they seek to capture.  Then, I will walk through a model for question answering that learns logical forms in an unsupervised way.  Learning such a model requires dealing with both combinatorial explosions and non-convexities, heavily stressing existing machine learning techniques.  I will conclude by highlighting how these challenges point to exciting opportunities for developing new learning algorithms.