

It's Time for Reasoning

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Abstract

The fundamental issue underlying natural language understanding is that of semantics – there is a need to move toward understanding natural language at an appropriate level of abstraction in order to support natural language understanding and communication with computers. Machine Learning has become ubiquitous in our attempt to induce semantic representations of natural language and support decisions that depend on it; however, while we have made significant progress over the last few years, it has focused on classification tasks for which we have large amounts of annotated data. Supporting high level decisions that depend on natural language understanding is still beyond our capabilities, partly since most of these tasks are very sparse and knowledge-intensive, and generating supervision signals for it does not scale. I will discuss some of the challenges underlying reasoning – making natural language understanding decisions that depend on multiple, interdependent, models, and exemplify it mostly using the domain of Reasoning about Time, as it is expressed in natural language.

Biography. Dan Roth is the Eduardo D. Glandt Distinguished Professor at the Department of Computer and Information Science, University of Pennsylvania, lead of NLP Science at Amazon AWS AI, and a Fellow of the AAAS, the ACM, AAI, and the ACL. In 2017 Roth was awarded the John McCarthy Award, the highest award the AI community gives to mid-career AI researchers. Roth was recognized “for major conceptual and theoretical advances in the modeling of natural language understanding, machine learning, and reasoning.” Roth has published broadly in machine learning, natural language processing, knowledge representation and reasoning, and learning theory, and has developed advanced machine learning based tools for natural language applications that are being used widely. Roth was the Editor-in-Chief of the Journal of Artificial Intelligence Research (JAIR) and a program chair of AAI, ACL, and CoNLL. Roth has been involved in several startups; most recently he was a co-founder and chief scientist of NexLP, a startup that leverages the latest advances in Natural Language Processing (NLP), Cognitive Analytics, and Machine Learning in the legal and compliance domains. NexLP was acquired by Reveal in 2020. Prof. Roth received his B.A Summa cum laude in Mathematics from the Technion, Israel, and his Ph.D. in Computer Science from Harvard University in 1995.