Steven Bethard, PhD  
Institute of Cognitive Science  
University of Colorado Boulder

**Title:** Understanding Timelines in Natural Language Narratives

**Abstract:** Finding the events in a narrative and placing them in order along a timeline is a crucial task for natural language understanding. However, most natural language narratives do not provide event timelines in structured form. Rather, they must be inferred from linguistic cues in phrases like "The medication was discontinued 24-hours ago" or  "Before the bear observed him, the traveller climbed a tree".

In this talk, I will discuss how to construct machine learning models for extracting timelines from natural language narratives. I'll first present a common architecture for timeline extraction: a series of supervised machine learning components trained on example texts whose timelines have been annotated manually by humans. Then I will show how to improve this approach by leveraging additional plain text data that has not been annotated by humans but nonetheless reveals some patterns in how humans talk about time. Finally, I will present an alternative approach to timeline extraction, inspired by human processing of narratives, that produces more complete timelines in the form of dependency structures.