Dissertation Defense

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Models and Algorithms for Human Action Understanding

Friday, August 14, 2020
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ABSTRACT: Understanding human behavior is crucial for any autonomous system which interacts with humans. For example, assistive robots need to know when a person is signaling for help, and autonomous vehicles need to know when a person is waiting to cross the street. However, identifying human actions in video is a challenging and unsolved problem. In this work, we address several of the key challenges in human action recognition. To enable better representations of video sequences, we develop novel deep learning architectures which improve representations both at the level of instantaneous motion as well as at the level of long-term context. In addition, to reduce reliance on fixed action vocabularies, we develop a compositional representation of actions which allows novel action descriptions to be represented as a sequence of sub-actions. Finally, we address the issue of data collection for human action understanding by creating a large-scale video dataset, consisting of 70 million videos collected from internet video sharing sites and their matched descriptions. We demonstrate that these contributions improve the generalization performance of human action recognition systems on several benchmark datasets.

Chairs: Profs. Jia Deng and Rada Mihalcea