Proceedings of the Twenty-Ninth International
Florida Artificial Intelligence Research Society Conference

FLAIRS-29 Poster Abstracts

Zdravko Markov and **Ingrid Russell**

Editors

Evaluation Technique for Argumentation Architectures from the Perspective of Human Cognition

Abdulrahman Alqahtani, Marius Silaghi
(Florida Institute of Technology, USA)

DirectDemocracyP2P (ddp2p.net) provides an environment for electronic debates, moderated in a decentralized way by ordering justifications (aka comments) based on collaborative filtering. The intuition was that comment threading models for such systems ought to have the peculiarity that each user should be allowed to submit a single justification when voting for a given motion, unlike common fora. To verify such intuitions, it is important to evaluate and compare the qualities of different available threading models with respect to specific applications. We propose to use a set of interviews to evaluate the "Understandability" of different threading models. We ask participants to navigate the same debates on three systems with similar graphical features and where the only difference consists of the alternative threading models being analyzed. Then participants list the arguments they remember. The debate systems with the desired threading models are obtained using the flexible user interface of DebateDecide (debatedecide.org) and the main challenge remained to port the same debates into the corresponding threading models. The solution undertaken in our study consists of selecting two debates from a well-organized televised session rich in arguments and interaction, but an unusual topic, such as to provide a level playground to the interviewed participants. The debates are further recast into the compared models by replaying them in the way expected from advanced users of the corresponding systems.

Activity Transition Detection by Relative Density Ratio Estimation

Samaneh Aminikhanghahi, Diane Cook
(Washington State University, USA)

Detecting activity breakpoints or transitions based on characteristics of observed sensor data from smart homes or mobile devices can be formulated as change point detection. Change points are abrupt variations in time series data and they are useful in segmenting activities, interacting with humans while minimizing interruptions, providing activity-aware services, and detecting changes in behavior that pro-vide insights on health status. In this work, we consider the problem of detecting activity transitions using a non-parametric unsupervised machine learning technique, Relative unconstrained Least-Squares Importance Fitting (RuLSIF) and test the algorithm on an unscripted smart home data. RuLSIF is an algorithm to directly estimate the relative density ratio between two consecutive intervals of data using Pear-son (PE) divergence as a dissimilarity measure. The ratio is used to detect changes in the underlying data distribution and the higher the ratio measure is, the more likely the point is a change point. The experiments conducted to evaluate RuLSIF on real-world smart home datasets show promising result with a true positive rate of greater than 70%. Our future study is to integrate change point detection algorithm with a smart home activity recognition and prompting system to test the effectiveness of the algorithm.

Practical 3D Tracking Using Low-Cost Cameras

Roman Barták, Michal Koutný, David Obdrzalek
(Charles University in Prague, Czech Republic)

Tracking of objects in 3D space in general is not an easy task. There exist solutions involving hi-tech cameras and powerful computer systems capable of tracking many objects simultaneously (and changing the number of them) in a large dynamic space in real time. On the other hand, there are situations where such functionality is not necessary and the conditions may be specified in more detail, which makes the task significantly easier. This work falls in this second category. It shows the possibility to track a single object using low-cost cameras on an ordinary laptop in a small-scale and mostly static environment. This solution is useful for tracking a single object of interest in mobile robotics and particularly in the debugging phases, where the user needs to judge the robot movement system independently on what the robot claims.