NANYANG TECHNOLOGICAL UNIVERSITY

institute for media innovation
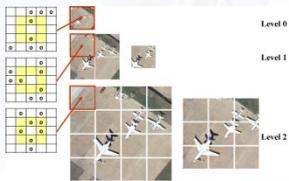The avant-garde place

IMI RESEARCH SEMINAR

DATE: 21 May 2015, Thursday
TIME: 11:00 am – 12:30 pm
VENUE: IMI Seminar Room, Research Techno Plaza, XFrontiers, Level 03-01
50 Nanyang Drive, Singapore 637553
*Lunch will be served

REN Jianfeng
Research Associate,
IMI

Learning LBP Structure by Maximizing the Conditional Mutual Information

Local binary patterns of more bits extracted in a large structure have shown promising results in visual recognition applications. This results in very high-dimensional data so that it is not feasible to directly extract features from the LBP histogram. Instead of extracting features from the LBP histogram, we propose a new approach to learn discriminative LBP structures for a specific application. Our objective is to select an optimal subset of binarized-pixel-difference features to compose the LBP structure. As these features are strongly correlated, conventional feature-selection methods may not yield a desirable performance. Thus, we propose an incremental Maximal-Conditional-Mutual-Information scheme for LBP structure learning. The proposed approach has demonstrated a superior performance over the state-of-the-arts results on various recognition tasks.

ZHAO Mengyao
PhD Student,
SCE / IMI

Deceptive 3D Background Replacement in Telepresence

Real-time background composition has various application scenarios, especially in 3D Telepresence.
However, most research directly replace the background with 2D image, and few have combined depth information with background composition.
This has led to unnatural composition result due to the mismatch of the background scenes when captured, and the creativity of new scene is limited by direct background replacement.
In this project, we would like to extend the conventional 2D background composition to 3D with RGBD information to achieve immersive telepresence user experience.
The difficulty of this mainly lies on the differences of layout between the two different scenes.
Therefore, our main objective in this study is the analysis of layouts in two RGBD scenes to produce a new natural 3D scene in an automatic way.
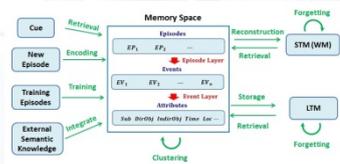
ZHANG Juzheng
PhD Student,
SCE / IMI

Computational Episodic Memory for Virtual Agents

Episodic memory stores the past experience of the virtual agents to improve their performance in problem-solving and human-agent interactions. The episodes are constituted by sequence of events, and each event contains several attributes. To model the latent relations among episodes, we built a hierarchical dimensional episodic memory model with two layers: the layer 1 models the relations between attributes and events, while the layer 2 models the relations between events and episodes. Memories are represented as vectors in the space, where the similar or related attributes, events or episodes are arranged closer. So that once an episode is encoded, we can easily find its relations with other episodes, the same for attributes and events. We also combine the episodic memory with existing semantic knowledge to realize semantic matching instead of exact word matching in episode retrieval. The most related episodes are retrieved and reconstructed for the current task.
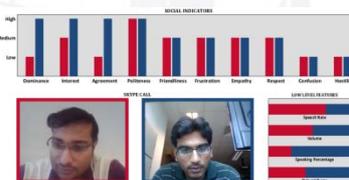
CHAKRABORTY Debsubhra
PhD Student,
IGS / IMI

Real-Time Socio-feedback: A VoIP Application and a Correlation Study

Understanding of human social behavior is key to building socially intelligent computer systems for the modern world. Such social behavior is often manifested through nonverbal cues ingrained in social signals such as Dominance, Politeness and Confusion used during interactions. Receiving feedback on these social signals during conversations in real-time can help the speakers adapt their behavior appropriately. To this goal, a system was created on a VoIP platform (Skype) which can provide real-time feedback to the speakers on these social indicators. In addition, a linear correlation study between ten of such social signals and between the signals and the nonverbal audio-video features extracted from a total of 496 two-person face-to-face recordings was performed. It indicates redundancies among the signals and the features which can lead to a simpler implementation of a real-time socio-feedback system.

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