3rd International Workshop on Affective Interaction in Natural Environments (AFFINE)

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ABSTRACT

The 3rd International Workshop on Affective Interaction in Natural Environments, AFFINE, follows a number of successful AFFINE workshops and events commencing in 2008. A key aim of AFFINE is the identification and investigation of significant open issues in real-time, affect-aware applications 'in the wild' and especially in embodied interaction, for example, with robots or virtual agents. AFFINE seeks to bring together researchers working on the real-time interpretation of user behaviour with those who are concerned with social robot and virtual agent interaction frameworks.

Categories and Subject Descriptors

H.5.2 [**Information Interfaces and Presentation**]: User Interfaces; J.4 [**Computer Applications**]: Social and Behavioural Sciences

General Terms

Algorithms, Human Factors, Design, Theory

Keywords

Affect, naturalistic interaction, social robots, virtual agents

1. INTRODUCTION

A vital requirement for social robots, virtual agents, and human-centered multimedia interfaces is the ability to infer the affective and mental states of humans and provide appropriate, timely output during sustained social interactions (see for example, [3, 2, 1, 4]). Examples include ensuring that the user is interested in maintaining the interaction or providing suitable empathic responses through the display of facial expressions, gestures, or generation of speech.

AFFINE covers real-time computational techniques for the recognition and interpretation of human multimodal verbal and non-verbal behaviour, models of mentalising and empathising for interaction, and multimedia techniques for synthesis of believable social behaviour supporting human-agent and human-robot interaction.

The AFFINE workshop at ACM Multimedia 2010 follows previous successful AFFINE workshops organised as satellite events of ICMI'08 [1] and ICMI-MLMI'09 [2], and the AFFINE special session organised at WIAMIS'09 [3]. The first AFFINE workshop was followed by a special issue of the Springer Journal on Multimodal User Interfaces (JMUI) published in March 2010.

2. AIM AND AUDIENCE

A key aim of the workshop is the identification and investigation of important open issues in real-time, affect-aware applications 'in the wild' and especially in embodied interaction, i.e. with robots and embodied conversational agents. Issues such as natural and multimodal interaction, estimation and adaption to context, context dependent processing and related databases, HCI/HRI beyond emotion (cognition, behaviour, etc.), and best practices for applications in real environments will be discussed in the context of interacting with other humans and social artefacts.

AFFINE seeks to bring together those who work on the real-time interpretation of user behaviour to produce mid- or high-level state descriptors, from basic emotions to more complex appraisals or mental states (e.g. agreement and interest, or blends of several emotions) with those who wish to apply this capacity as part of a social perception module or equivalent in social robots and virtual agent interaction frameworks.

We welcome the participation of researchers from diverse fields, including signal processing and pattern recognition,

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[1] http://www.telecom.tuc.gr/ potam/icmi2008/
[2] http://icmi2009.acm.org/
[3] http://wiamis2009.qmul.net/

machine learning, cognition, affective science, human-computer interaction, human-robot interaction, and robotics. The workshop especially welcomes studies that provide new insights into the use of multimodal and multimedia techniques for enabling interaction between humans, robots, and virtual agents in naturalistic settings.

3. TOPICS

The workshops topics include (but are not limited to):

- Multimedia expression generation in robots and virtual agents, including gaze, gestures, facial expressions, speech and other modalities

- Multimodal human affect and social behaviour recognition, including facial expressions, body language, speech, physiological and other modalities

- Perception-action loops in agents/robots

- Cognitive and affective mentalising

- Visual attention / user engagement with robots and embodied conversational agents (ECAs)

- Emotion and cognitive state representation

- Social context awareness and adaptation

- Natural Human-Robot Interaction (HRI) / Human-Computer Interaction (HCI)

- Multimedia HCI

- Multimodal and emotional corpora (naturally evoked or induced emotion)

- Recognition of human behaviour for implicit tagging

- Applications to interactive games, robots and virtual agents

4. CONTENT

The workshop submissions covered a diverse domain of topics relating to the workshop themes. They could be generally categorised into three basic categories concerning analysis and recognition, generation and interaction, respectively.

In terms of a focus on analysis and recognition, papers on enjoyment recognition from physiological data by Tognetti et al., training data selection for emotion recognition based on speech data by Bozkurt et al., genetic search feature selection for affective modeling based on reported references by Perez Martinez and Yannakakis and real-time labeling of affect in music by Broekens, were received.

Other papers focus more on those aspects related to the generation of signals or selection of appropriate responses for computational systems: for example, the synthesis of expressions using facial feature point tracking for helping to determine how emotion is conveyed in the work of Baltrusaitis et al., the selection of appropriate agent responses by ter Maat and Heylen, and a study on emotional body language displayed by robots by Beck et al.

Many submissions concerned studies on human-robot and human-agent interaction, with a focus both on the technology and the way users perceive it: non-verbal speech cues are studied for social interaction between human and robots in research conducted by Delaborde and Devillers, communicative speech and gaze are considered for human-robot cooperation by Boucher et al. and the importance of gaze is highlighted for face-to-face collaborative tasks in the work of Fagel and Bailly. Deshmukh et al. consider social perception abilities allowing interactions to start between humans and robots, while Read and Belpaeme consider the influence of physical appearance on one's interpretation of non-linguistic utterances by robots. Leite et al. describe work towards closing the affect loop, from the recognition of affect to achieving empathic interactions, while Girard and Johnson propose the design of learning companions with teachers as design partners. Motivational health companions in the home are the subject of the work by Evers and Kröse. Wu considers if polite computers can help to elicit better performance from humans, and Vatavu describes interfaces based on digital photoware for supporting affective human-human interactions.

Special speaker In addition to the standard workshop presentations, Prof. Antonio Camurri, the founder and scientific director of the InfoMus Lab at DIST-University of Genova, will deliver an invited speech on the automated analysis of non-verbal affective and social behaviour.

5. OUTCOMES

Issues such as natural and multimodal interaction, estimation and adaption to context, context dependent processing and related databases, HCI/HRI beyond emotion (cognition, behaviour, etc.) and best practices for application to real environments will be discussed in the context of interacting with other humans and social artefacts. Additionally, we are hopeful that researchers from diverse fields, including signal processing and pattern recognition, machine learning, cognition, HCI, HRI and robotics, will benefit from mutual osmosis of ideas, concepts and developments in the field. We anticipate important outcomes relating to the identification and investigation of open issues in real-time, affect-aware applications, especially in embodied interaction.

Special issue As a follow-up to the workshop, a special issue of ACM Transactions on Interactive Intelligent Systems is being organised, based on the general themes of the AFFINE workshop. The call for papers is open, so those who were unable to attend the workshop will have a further opportunity to contribute to this exciting field accompanying a friendly community of motivated researchers.

6. REFERENCES

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