Guest Editorial

Special issue on communicative social signals: Computational and behavioural aspects of human-human and human-machine interaction

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Abstract. This special issue finds its inspiration from the papers submitted at the 3rd IEEE CogInfoCom Conference held in KOSICE (RS), from the 2nd to the 5th of December, 2012.

Keywords: Human-human and human-machine communication, multimodal communicative signals, cognitive processes, socially believable ICT Interfaces

1. Introduction

The CogInfoCom conference is an yearly conference aiming to bring together researchers from various different scientific fields – related to natural cognitive systems as well as Information Communication Technologies (ICT) – in order to discuss the implications of the merging process between humans and ICT for future engineering systems.

The primary goal of CogInfoCom is to provide a systematic view of how cognitive processes can co-evolve with infocommunications devices so that the capabilities of the human brain may not only be extended through these devices, irrespective of the geographical distance, but may also interact with the capabilities of any artificially cognitive system. This merging and ex-tension of cognitive capabilities is targeted towards engineering applications in which artificial and/or natural cognitive systems are enabled to work together more friendly and effectively.

The conference held several tracks. In particular, this special issue is inspired by the track on *Communicative social signals: Computational and behavioural aspects of human-human and human-machine interaction* organized by Anna Esposito (UNINA2 & IIASS, IT), Klara Vicsi (BME, HU) and Alessandro Vinciarelli (University of Glasgow, UK).

This track gathered original works on behavioural analysis of human interaction, – that consider the amount of information conveyed by static and dynamic communicative social signals such as facial and vocal expressions, gestures, gaze, body movements – and the theoretical and computational issue of defining algorithms, programming languages, and deterministic models for their recognition, synthesis, and exploitation in the implementation of advanced interactive dialogue systems and intelligent avatars. Data on com-

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munication, actions, perception, and emotion were discussed both from an experimental and theoretical point of view in order to provide computational paradigms to implement trustful, credible, satisfactory and emotionally coloured multimodal systems. To this aim, the papers in this special issue give insights on the themes discussed there.

The first paper, authored by Costanza Navaretta deals with speech, emotions and facial expressions in first encounters dyadic spontaneous conversations. It establishes that facial expressions of emotions in first encounters are often related to specific speech tokens, and are strongly affected by individual differences.

The second paper, authored by Gellért Sárosi, Balázs Tarján, Tibor Fegyó, and Péter Mihajlik describes an algorithm to automatically transcribe real-life Call Center conversations exploiting non-verbal acoustic events achieving less than 15% of the word error rate.

The paper authored by Stanislav Ondas, Jozef Juhar and Marian Trnka reports on the design and development of SIMONA – a Slovak embodied conversational agent that exploits speech, gestures, head movements and body posture to communicate with users.

The authors Tamás Gábor Csapó and Géza Németh describe a novel codebook-based excitation model for implementing a statistical parametric speech synthesis, while András Beke, Mária Gósy report on phonetic analysis and automatic prediction of vowel duration in Hungarian spontaneous speech. Finally the paper authored by Dávid Sztahó, KláraVicsi describes an automatic speech segmentation algorithm able to detect emotional speech segments.

Taken all together, these papers highlight efforts made in the psychological, linguistic and engineering domains to address Cognitive Information Communication problems and underline the need for multidisciplinary efforts encouraged at the CogInfoCom Conference series.

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The Guest Editors
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