SOUTH-EAST EUROPEAN RESEARCH CENTRE

SEERC

SEERC
24 Proxenou Koromila Street
54622, Thessaloniki, Greece
Tel: +30 2310-253477/8
Fax: +30 2310 234205
www.seerc.org
Email: contact@seerc.org

RESEARCH STUDENTS' SEMINAR SERIES

Monday 31 March 2014
12:15 – 13:15
A3 Room, 2nd Floor Strategakis Bldg

"An Emotional BDI Agent Model: The influential role of emotions to the perceptual and cognitive process"

By
Mr. Dionysios Basakos,
PhD Student,
Dept. of Computer Science, TUoS

ABSTRACT

The effect of emotions to human cognitive processes has been established as an important influential factor. Research in the fields of cognitive neuroscience and psychology portray emotions as a key element to the decision-making process to an extent where the absence of affective capabilities, due to brain damage, leads to a total collapse of a person's ability to make a simple choice. The concept of emotions in Computer Science is relatively new and it is mainly realised in the fields of Affective Computing and Artificial Intelligent Agents. There exist a number of architectures that incorporate emotions in to artificial Agent's design. Most of them are based on the concept of the Emotion-Based Agent architecture, where emotions are modelled to reflect specific reasoning processes. On the other hand, another direction has been taken towards the logical formalisation of artificial emotions as cognitive Agents where artificial emotions are separate mechanisms within the model. The most commonly used cognitive Agent architecture is the BDI Agent. In artificial Agent modelling, the utilisation of emotions can elicit reactive behaviour and act as a motivator and influence plan selection. To a large extend artificial Agents were developed to demonstrate rational behaviour as an outcome of consistent reasoning based on perception, beliefs, communication and goals. However, in several domains emotions may result in a completely different behaviour, possibly affecting all the above attributes. A survey on different computational models of cognitive BDI Agents with emotional capabilities suggests that emotional Agent modelling is purpose bound and is construed in the context of believability or performance, treading on different philosophical and psychological paths and practical approaches. It also relays the fact that emotional influence is largely concentrated on planning rather than other mental attributes such as beliefs or desires and it is manifested as an action selector. Emotions in Agent and Multi-Agent Systems change their behaviour to a more "natural" way of performing tasks thus increasing believability. This has various implications on the overall performance of a system. In particular in situations where emotions play an important role, such as disaster management, it is a challenge to infuse artificial emotions into Agents, especially when a plethora of emotion theories are yet to be fully accepted. This research focuses on the effect of emotions on the cognitive Agent's decision-making process as a result to a catholic integration of affective elements to the BDI architecture. It aims to investigate the influence of emotions to Agent's perception, currently neglected in Agent design, and consequently to explore the impact of the internal emotional state to the way that an Agent perceive its environment and acts on and upon it. To facilitate the aforementioned aims, a new emotional BDI model will be designed, equipped with a perceptual modulation component and an emotionally influenced belief system. The proposed model will be verified via a series of realistic simulation of crowd evacuations under extreme danger situations.

The seminar series is open to all members of *staff* and *students* of CITY and to any *externals* that wish to attend.

The University Of Sheffield. | CITY College An International Faculty Of The University.