Proceedings of the third Workshop on

Affective Computing and Context Awareness
in Ambient Intelligence

AfCAI 2019

held in Universidad Politécnica de Cartagena, Spain, on 11-12 November 2019[1]

http://afcai.eu

Affective computing (AfC) is a multidisciplinary research approach regarding practical modeling and use of information about human emotions in computer systems. Originally proposed over 20 years ago, it became a field where researchers and practitioners from computer science and artificial intelligence (AI) meet with psychologists, neuroscientists, biomedical engineers, and researchers from humanities.

The main objectives of the AfCAI workshop series is to put selected problems and methods from the area of AfC into a specific engineering context. Our focus is to consider use cases and applications of AfC techniques within the scope of context-aware systems and ambient intelligence. The workshop series was originally proposed by Grzegorz J. Nalepa. The first AfCAI workshop was organized in Universidad de Murcia, Spain in November 2016, with Maria Trinidad Herrero Ezquerro and José Tomás Palma Méndez as co-chairs. It featured 13 oral presentations, an invited lecture from researchers from 5 countries and a brainstorming session. After the workshop, a special issue of the Future Generation Computer Systems journal from Elsevier was edited. The second edition was organized in April 2018 in Universitat Politècnica de València and co-chaired by Grzegorz J. Nalepa, Vicente Julian, and José Palma and included 14 papers from 8 countries.

The third edition of AfCAI was held in Universidad Politécnica de Cartagena, Spain, on 11-12 November 2019, with Grzegorz J. Nalepa (AGH University of Science and Technology, Jagiellonian University), José Manuel Ferrández (Universidad Politécnica de Cartagena), José Palma (Universidad de Murcia), and Vicente Julian (Universitat Politècnica de València). The organization team consisted of Javier Garrigós (Universidad Politécnica de Cartagena), José Javier Martínez (Universidad Politécnica de Cartagena), and José Palma (Universidad de Murcia).

The international program committee included Piotr Augustyniak (AGH University of Science and Technology, Poland), Martin Atzmueller (Tilburg University, The Netherlands), Kerstin Bach (Norwegian University of Science and Technology), Costin Badica (University of Craiova, Romania), Joachim Baumeister (denkbares GmbH, Universitat Wuerzburg, Germany), David Camacho (Universidad Autónoma de Madrid, Spain), Davide Carneiro (ESTG - Politecnico do Porto, Portugal), Carlos Carrascosa (Universitat Politecnica de Valencia, Spain), Angelo Costa (University of Minho, Portugal), Maria Trinidad Herrero Ezquerro (Universidad de Murcia, Spain), Marco de Gemmis (University of Bari Alto, Italy), Sergio Gonçalves (University of Vigo, Spain), Mirjana Ivanovic (University of Novi Sad, Serbia), Vicente Julian (Universitat Politecnica de Valencia, Spain), Jason J. Jung (Chung

Ang University, South Korea), Andrej Košir (University of Ljubljana, Slovenia), Grzegorz J. Nalepa (AGH University of Science and Technology, Jagiellonian University, Poland), Paulo Novais (Universidade do Minho, Portugal), José Palma (Universidad de Murcia), Marie Postma (Tilburg University, The Netherlands), Ricardo Ramos (University of Minho, Portugal), Manuel Fernando Rodrigues (ESTG – Politecnico do Porto, Portugal), Marko Tkalcic (Free University of Bozen-Bolzano, Italy), and Paweł Węgrzyn (Jagiellonian University, Poland).

The workshop included 10 papers organized in 3 sessions, and presented by authors from 5 countries, and a brainstorming session devoted to joint project plans. The papers are briefly described below.

One of the key issues in AfC is the development of computer models for emotion classification and recognition from physiological signals. To this end, Kutt et al. introduce BIRRAFFE, a public data set which is the result of an experiment in AfC which integrates data from both visual and audio stimuli. In their experiment, ECG, GSR and facial expressions are constantly recorded after exposing subjects to stimuli in two different setups: first using standard databases (such as IADS and IAPS) and, second, making subjects play video games. Related to this, López-Alés et al. describe a methodology, based on machine-learning techniques, that allows the development of emotion classification and recognition models using low-cost hardware from data recorded by medical oriented devices.

In recent years, the application of AfC techniques to video games has raised the attention of the research community. Argasiński et al. introduce the concept of Affective Patterns in Serious Games. Tested in a VR Firefighter Training Simulator, Affective Patterns are aimed to provide the sets of stimuli that will cause the appropriate reaction to the user. Camacho and Menéndez present the preliminary results of the SAVEit project, joint research aimed to use AfC and other technologies for promoting values and good attitudes on sports for children using Serious Games. Lately, Giżycka et al. demonstrate how useful Affective Patterns can be in Serious Games when they are integrated with context-aware technologies. They present "Meet Cracow" an Affective and Location-based Serious Game aimed to educate players about the culturally significant objects and facilities that they may encounter while walking around a city.

Another important application field that has benefited from AfC Technology is Elderlies Care. In this line, Taverner et al. describe the preliminary results of an experiment which tries to find the factors that affect human affective behaviour in order to develop affective agents which can simulate them. To this end, the experiment focused on the effect of personality on the differences between different moods, showing that there is a correlation between personality and initial moods. Rincon et al. present a low cost affective personal trainer aimed to monitor physical activities carried out by elderlies. Not only the use of non-invasive sensors allows caregivers to determine how exercises are performed, but emotion detection techniques make possible to take into account how the person feels and, thus, determine more precisely whether the exercise is appropriate or not. Sorinas et al. discuss how recognition of emotions can help to the diagnosis of neurodegenerative diseases in early stages. They propose some experimentation protocols that allows the evaluation of the emotional state of subjects based on AfC techniques.

Finally, two papers try to explore the potentials of AfC in analysing Social Group Interactions. Doan et al. explore the potentials for multimodal sensor data (including GSR, face-to-face proximity and vocal non-verbal features) in the analysis for dialogic moments in the context of storytelling. Preliminary findings provide a novel perspective on different profiles of dialogic moments, characterized by objective and subjective features. In another paper, Atzmueller analyses the design of computational methods taking into account cognitive,

human-machine and computational requirements in an integrated way. Specifically, he sketches an approach for the socio-technical design of explicative systems enabling transparent, interpretable and explainable analytics of social interactions.

These submissions present an interesting and developing research landscape. Considering the growing success of the workshop, we are planning to continue organizing it. The next edition is planned for the mid 2021 in Spain.

The Editors

Grzegorz J. Nalepa

José Manuel Ferrández

José Palma

Vicente Julian