Chapter 58
A Study of the State of the Art in Synthetic Emotional Intelligence in Affective Computing

Syeda Erfana Zohora
Taif University, Saudi Arabia

Arvind K. Srivastava
Systron Donner Inertial, USA

A. M. Khan
Mangalore University, India

Nhu Gia Nguyen
Duy Tan University, Vietnam

Nilanjan Dey
TechnoIndia College of Technology, India

ABSTRACT

In the last few decades there has been a tremendous amount of research on synthetic emotional intelligence related to affective computing that has significantly advanced from the technological point of view that refers to academic studies, systematic learning and developing knowledge and affective technology to a extensive area of real life time systems coupled with their applications. The objective of this paper is to present a general idea on the area of emotional intelligence in affective computing. The overview of the state of the art in emotional intelligence comprises of basic definitions and terminology, a study of current technological scenario. The paper also proposes research activities with a detailed study of ethical issues, challenges with importance on affective computing. Lastly, we present a broad area of applications such as interactive learning emotional systems, modeling emotional agents with an intention of employing these agents in human computer interactions as well as in education.

INTRODUCTION

The development of information technology, emotional intelligence in affective computing has contributed significantly towards the evolution of intelligent machine in the current technological scenario. The computer human interaction has constantly increased also. Many researchers in the fields of emotional Intelligence and Human Computer Interaction have highlighted that the agents or intelligent machines of the future must collaborate on an emotional height with their users (Norman, 2004). This is establishing on the concept that an intelligent and intellectual human is not only advanced in verbal, logical reasoning and mathematical, but is also able to attach with other human beings. Much recent work in this area has aimed on authorizing agents with the caliber to both detect emotion based on verbal, non-verbal, and textual thoughts, and also conveys emotion through speech and gesture. The field of Affective Computing (AC) aspires to narrow the communicative gap between the highly emotional human and the emotionally challenged computer by building computational systems that identify and respond to the affective states (e.g., moods and emotions) of the user. Affect-sensitive interfaces are being developed in a number of fields, including mental health, learning technologies and gaming.

What Are Emotions? Emotion theorists have debated for decades about what emotions are and what their primary function in human life is. This debate is far from over and there is currently no universally agreed upon definition of emotions. However, many scholars would at least agree that we experience different types of emotions in our everyday lives.

Emotions are an important aspect of life and they play an crucial role to understand user's behavior with computer interaction. In addition, the emotional intelligence plays a important role to measure aspects of success in life. Recent researches in human-computer interaction don't aim only on the cognitive approach, but on the emotions part too. Both techniques are very important, indeed take into account that emotions of the user solve some important aspects of the design in HCI systems. Additionally, the human-machine interaction could be better if the machine can adapt its behavior according to users; and this system is seen more natural, efficacious, persuasive, and trustworthy by users.

The theory of emotional intelligence became recognized in the late 1980's; on the other hand, the research study (Thorndike, 1920) presented an identical perception called social intelligence in the earlier period, during 1920. While one's social intelligence is classically described by their "ability to recognize and handle other people and to relate in adaptive social interactions" (Kihlstrom, J.F., & Cantor, N. (2000)). Emotional intelligence is a facet of human intelligence that has been argued to be the main important theory for a successful social life (Goleman, 1995), emotional intelligence refers to one's skill to perceive, recognize, manage, and state emotion within oneself and in dealing with others (Salovey & Mayer, 1990). The authors Salovey and Mayer define five domains critical to emotional intelligence: knowing one's emotions, managing emotions, motivating one, recognizing emotions in others, and handling relationships. When we deal with computers, not all of the computers need emotional intelligence and none will need all of the associated skills that we need from them. However, man-machine interactive systems proficient of sensing stress, negligence and thoughtfulness and skilled of adapting and responding suitably to these affective states of the user are probably to be perceived as more natural, more efficacious and more trustworthy. The research area of machine analysis and employment of human affective states to build more natural, flexible interactive systems refers to the introduction of affective computing.

Related Content

P-MATCH: Identifying Part Name in Noisy Text Data
Anne Kao, Stephen R. Poteet, David H. Jonesand David Augustine (2012). *Cross-Disciplinary Advances in Applied Natural Language Processing: Issues and Approaches (pp. 172-184).*
www.irma-international.org/chapter/match-identifying-part-name-noisy/64587

Improving Collaborative Filtering Algorithms: Sentiment-based Approach in Social Network
Firas Ben Kharrat, Aymen Elkhleifiand Rim Faiz (2020). *Natural Language Processing: Concepts, Methodologies, Tools, and Applications (pp. 638-657).*
www.irma-international.org/chapter/improving-collaborative-filtering-algorithms/239958

Building Language Resources for Emotion Analysis in Bengali
Dipankar Dasand Sivaji Bandyopadhyay (2013). *Technical Challenges and Design Issues in Bangla Language Processing (pp. 346-368).*
www.irma-international.org/chapter/building-language-resources-emotion-analysis/78483

Departing the Ontology Layer Cake
Abel Browarnikand Oded Maimon (2015). *Modern Computational Models of Semantic Discovery in Natural Language (pp. 167-203).*
www.irma-international.org/chapter/departing-the-ontology-layer-cake/133879

A Corpus-Stylistic Approach of the Treatises of Great Athanasius About Idolatry
Georgios Alexandropoulos (2015). *Modern Computational Models of Semantic Discovery in Natural Language (pp. 273-299).*
www.irma-international.org/chapter/a-corpus-stylistic-approach-of-the-treatises-of-great-athanasius-about-idolatry/133883