Chapter 8.5
Emotional Ambient Media

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ABSTRACT

The "medium is the message": nowadays the medium as such is non-distinguishable from its presentation environment. However, what is the medium in an ambient environment, when the environment is *smart*, *recognizes emotions,* and at the same time *responsive?* Emotions have had an inferior role in philosophy, psychology, art, and nowadays in media technology. In philosophy and psychology many researchers devoted their work to the question what emotions are, and how they can be modelled, ranging from common-sense theories, theories that emotions are simply physiological disturbances, and the many behaviour theories describing emotions providing a much more comprehensive view on emotions (Solomon, 1977). In the age of ambient media, where media technology is embedded seamlessly and hidden into the natural environment of the consumer, the view towards media is changing. The modality how emotions are experienced and the technology to recognize and simulate emotions are changing. To support the theories within the scope of this chapter, a case study – the emotional ambient responsive character – has been performed. The concept was realised as a simple interactive game responding to human emotions. Within this book section, we present a technical oriented view towards recognizing, simulating, and binding emotions in ambient media systems. A case-study for an emotion recognition and response system is presented. The system integrates the content and emotion recognition elements.

BACKGROUND

Within the scope of this book chapter the fields of emotional computation, affective computation, psychology, very slightly the field of philosophy,

and ubiquitous- and pervasive computation are touched. The main background relies on the development of ambient media based on media technology coming from ambient intelligence. Current research in the field of emotional computation focuses around these questions:

- What is the relation between emotions and experience?
- How can emotional machines be modelled and implemented?
- What is the meaning of emotions in art and media?
- How can emotions and affects be recognized and generated?
- What are the linguistic and non-linguistic aspects of emotions?
- How can emotion classification based on media be performed?
- Which methods for evaluation of emotional impact,
- How can the affect of emotions be classified, evaluated, and measured?
- What are the linguistic aspects of emotions in text, speech, and media?
- Which models for factors impacting emotions exist (e.g. personality traits)?
- How can emotions be described, generated, parsed, and managed?
- What is the effect on human-computer or human-human interaction?
- How can emotional computation be applied in specific applications (e.g. gaming)
- Which new forms of dialogue systems involving emotion patterns emerge?
- What is the impact of emotions on cognitive robotics and multi-agent systems?

Originally media are delivered via distinguishable entities to the consumer (e.g. video stream, audio stream, image). In the age of ambient media, the entity that is perceived by the consumer is by far more complex to describe. A first definition for ambient media has been made by A. Lugmayr in (Lugmayr, 2007), and the form of ambient media can be described as "particular way in which ambient media assets physically exist or manifest themselves, morph the natural environment entities with the synthetic artificial created world, collaborate with each other, and intelligence of arrangements (composition) and contextualization of media assets and their subcomponents as an artistic or factual genre for the creation of human experience". Thus, the message of the medium is transmitted via any arbitrary signalling information – therefore the message of the ambient media system can be embedded anywhere – as ambient light in a living room, as intelligent car, as a smart phone recognizing the context of the consumer.

Especially media technology developed the need to gain understanding of several different aspects of emotions. Therefore this book section especially matches emotional binding to the media with the latest trends in the development of ambient media technology. It evaluates existing theories coming from philosophy and psychology in emotional research to adopt these with the needs of ambient media systems. From the technical view, a basic model for experience and emotion oriented computation in the field of ambient media is presented. Different existing methods and technologies are evaluated and presented. This includes techniques and methods for the recognition of human emotions. For many years the recognition of human emotions was major research field in artificial intelligence. After the disillusions in the field of AI, in recent decades, many questions where untouched. However, with the emergence of ambient intelligence, the field became a new retouch, and emotional computations gained importance as a major research field.

Another issue this book section is devoting to the evaluation of methods and techniques for the simulation of human emotions with the machine. With the emergence of intelligent computing, we are talking about collaboration with the machine, rather than using machines. Machines will assist