

# Chapter 62

## Emotional Context? Or Contextual Emotions?

**Diana Arellano**

*Filmakademie Baden-Wuerttemberg, Germany*

**Javier Varona**

*Universitat de les Illes Balears, Spain*

**Francisco J. Perales**

*Universitat de les Illes Balears, Spain*

### ABSTRACT

*The question “What is the meaning of a smile?” could be easily answered with the sentence “it means happiness”. But we can see in our daily lives that it is not always true. We also recognize that there is the context the one that makes us differentiate a happy smile from an embarrassed smile. The context is the framework that gives emotions a reason for happening because it describes what occurs around a person. Therefore, to create virtual characters, or agents that express emotions in a believable way it is necessary to simulate the context around them. The novelty of this chapter is the representation of context using ontologies, where context is seen not only as the events in the world, but also as that part of the character which allows them to react in one way or another, resulting in more believable emotional responses.*

### INTRODUCTION

In the world where we live, we are faced every day with technologies that make our devices closer to what we are, and that means, more human. For instance, we can literally talk to our mobile phones (e.g iPhone or Google Nexus) and ask things like the ones we could ask to a colleague or a friend. In turn, the device will reply with knowledge of our surrounding context, and in the near future, also with emotions.

These advances had made researchers and industry aware of the fact that without context there is no appropriate way to simulate reality. The same idea applies to virtual characters and virtual worlds where to achieve more human-like behaviours it is necessary to model and simulate their context. To

DOI: 10.4018/978-1-5225-0159-6.ch062

this respect, Dey et al. (2001) defined context as *any information that can be used to characterize the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user, the device and application themselves.*

Without a context it becomes difficult to discern between the meanings that one facial expression might have, to decide how to react to certain situation, or how the course of a story/situation should be unfolded. In this way, Kaiser & Wehrle (2008) stated that facial expressions can only be interpreted when they are inside a context (temporal or situational) that allows us to generate them in an accurate way.

The problem with representing full context is that one should also take into consideration elements like culture, religion, and other social rules and roles. This makes context representation and its appraisal a gigantic task. Nevertheless, when we think of children, we realize that their context has the same set of events, but their appraisal lacks of social rules, giving a more “pure” emotional response to those events.

With this in mind, we decided to represent context in the way a child would do it. Therefore, we can obtain a generic description of what is happening outside and inside the characters, and see how context helps to generate different emotional states in virtual characters, or virtual agents - both terms will be used indistinctly due to the diversity of applications they can be used for. If this description is achieved in a generic way (e.g. a number of situations can be obtained from an initial set of data), then we can have a variety of scenarios where we could observe the behaviour of our characters according to the occurred events. Later, it can be applied in different applications where it is required having a story, or the interaction between the character and its environment. Some examples are educational applications or story simulation (storytelling) where a script would be generated from the interaction between the character and its world.

This article is organized as follows. First, previous works on context and affect representation will be reviewed. Then an overview of the system framework we have developed will be presented, making special emphasis in the semantic model that we have designed and implemented. To explain how to use this semantic model a Use Case will be provided, for which we have used a movie scene that help us to validate our emotional output. Finally a discussion and what is expected in future works are presented.

## STATE OF ART

Context is what gives meaning to everything we do and how we do it. Therefore, a lot of effort has been invested in trying to model and define it. In the field of Computer Science some areas that have attempted to work on and with it are Affective Computing, Ubiquitous Computing, and Artificial Intelligence.

Strang & Linnhoff-Popien (2004) evaluated six of the most relevant existing approaches to model context for ubiquitous computing:

- **Key-Value Models:** Provide the value of context information (e.g. location information) to an application as an environment variable;
- **Markup Scheme Models:** Represent hierarchical data structure consisting of markup tags with attributes and content;
- **Graphical Models:** Represent context through diagrams as the Unified Modelling Language (UML), or the Object Role Modelling (ORM);
- **Object-Oriented Model:** The details of context processing are encapsulated in an object level, accessed through specified interfaces, and hence hidden to other components;

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