
The Augmented Knights' Castle: A Play Environment for Simultaneous and Co-Present Interaction and Playful Learning

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Augmented toys are traditional toys or game pieces that are equipped with sensing technology, computing power, and communication capabilities, allowing designers to incorporate novel gaming elements previously available only in video games. The aim is to retain the benefits of computer-supported interaction without diminishing the social aspect: children play together by sharing the playset and their stories, which consequently defines an augmented toy environment as a (set of) "shareable" tangible user interfaces, allowing for and encouraging simultaneous and co-present interaction.

We developed the Augmented Knights' Castle, an augmented version of the Playmobil Middle Ages play set (see Fig. 1). By utilizing radio frequency identification (RFID) technology, it is possible to unobtrusively and unambiguously track the play figures [1]. This information can then be used to provide tactile, visual, and audible effects to enhance the children's play experience and also to integrate playful educational content.



Figure 1: Children playing with the Augmented Knights' Castle.

To this end, we exploit the appearance of the physical toy figures, which is semantically connected to the role or function such a figure played in the Middle Ages. This semantic correspondence empowers children to easily understand the role or function of a play object.



Figure 2: The king gives information about different aspects of the medieval life.

The king, for example, explains what it is like to live with his family and court in a castle in the Middle Ages, including different topics, e.g., life in a castle, royal family, craftsmen and guilds, weaponry or heraldry. As shown in Fig. 2, the king invites a child to follow him through different areas and settings of the castle and explains for each setting different facts.

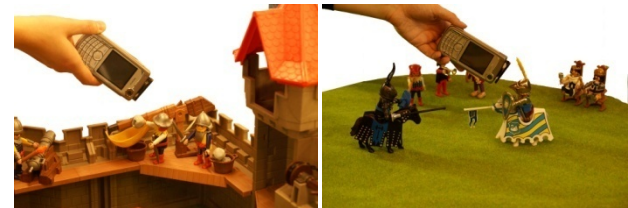


Figure 3: A cell phone as interaction device.

We moreover integrate mobile devices such as cell phones or PDAs equipped with RFID readers (see Fig. 3). These devices can then be used to display pictures or play videos to further foster the playful learning experience. Summing up, the Augmented Knight's Castle is designed to let several children simultaneously and/or collaboratively interact with it.

References

- [1] Lampe, M., Hinske, S.: "Integrating Interactive Learning Experiences into Augmented Toy Environments", In: Proc. of the Workshop on Pervasive Learning at Pervasive 2007, Toronto, Canada, 2007
- [2] Lampe, M., Hinske, S.: "The Augmented Knight's Castle – Integrating Pervasive and Mobile Computing Technologies into Traditional Toy Environments", In: Magerkurth, C., Röcker, C. (eds.): Pervasive Gaming Applications – A Reader for Pervasive Gaming Research Vol. 2, pp. 41-66, 2007