VirtualTable: a projection augmented reality game

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VirtualTable is a projection augmented reality installation where users are engaged in an interactive tower defense game. The installation runs continuously and is designed to attract people to a table, which the game is projected onto. Any number of players can join the game for an optional period of time. The goal is to prevent virtual stylized soot balls, spawning on one side of the table, from reaching the cheese. To stop them, the players can place any kind of object on the table, that then will become part of the game. Depending on the object, it will become either a wall, an obstacle for the soot balls, or a tower, that eliminates them within a physical range. The number of enemies is dependent on the number of objects in the field, forcing the players to use strategy and collaboration and not the sheer number of objects to win the game.

Our installation is an example of a combination of tangible user interfaces [Shaer and Hornecker 2010] and projection augmented reality [Mine et al. 2012]. Leitner et al. [2008] presented IncreTable, a tabletop game that includes multiple inputs from different devices, including physical objects. Molla and Lepetit [2010] present a similar concept of augmented board game, but in their case the output is visible and affect only the behavior of the soot balls. We project a red glow around the towers to distinguish them and give a visual feedback on their range (see Figure 1 (right)). When we update the set of recognized boxes, we compare it with the existing set. Matching boxes have their position updated, interpolating it with their old position to avoid flickering. The remaining boxes are either added or removed to the game accordingly. Objects are distinguished only by shape: elongated objects are walls, square-like objects towers.

The behavior of the soot balls is simulated using Unity Engine. The virtual game, wall objects are invisible and affect only the behavior of the soot balls. We project a red glow around the towers to distinguish them and give a visual feedback on their range (see Figure 1 (right)). When we update the set of recognized boxes, we compare it with the existing set. Matching boxes have their position updated, interpolating it with their old position to avoid flickering. The remaining boxes are either added or removed to the game accordingly. Objects are distinguished only by shape: elongated objects are walls, square-like objects towers.

The game explores the concept of augmented reality games, combining the tangible sensation of the pieces from board games and the immediate visual feedback from modern computer games.

References