

The Maze EV: a two player installation game

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ABSTRACT

We present a two player installation game called *The Maze EV*. The object of the game is for one player to try to escape a maze, before the time runs out, while their opponent creates and modifies that maze in real-time. During gameplay, the creation of the maze happens through the use of a tangible interface. The fact that the maze designer is able to modify the structure of the maze during the game gives the game a unique and dynamic feel.

Categories and Subject Descriptors

H.5.2 [User Interfaces]: Interaction styles, input devices and strategies

General Terms

Design

Keywords

Installation game, tangible user interfaces, tabletop interfaces, interaction techniques, mazes

1. INTRODUCTION

During last fifteen years we have seen several game proposals that use tabletop surfaces. Some of them had storytelling purposes [4], while others were interested in the educational benefits of using tabletop surfaces with very young children [3], and many of them were interested in combining the advantages of computer games with the social advantages of board games [1].

The Maze EV uses a tangible interface as the control mechanism for gameplay but its purpose is not educational. Furthermore it moves beyond a strictly tabletop / board game style in the sense that even if both players are in the same area, they are looking in opposite directions. In this sense, we classify *The Maze EV* as an installation, rather than tabletop, game because only one of the players interacts with a tabletop interface.

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The Maze EV explores the possibilities of using tangible elements for designing game spaces in real-time, where physical and the virtual elements merge in a hybrid environment that is shared by competing players.

2. PLAYER ROLES

2.1 The Designer

The Designer uses a multi-touch table as an interface which consists of two types of tangible elements for designing the maze: walls and pucks.



Figure 1: The Designer playing

2.1.1 Walls

Some plastic walls represent the walls of the maze. The Designer places them on top of the table in order to create his maze. When a wall is placed on the table-top it is highlighted green, this is the visual feedback that tells the Designer that his maze is being recognized.

2.1.2 Pucks

The other type of tangible elements are three different pucks which have fiducial markers. The game software uses the reactIVision framework[2] to recognize these markers. Of the three pucks, the first one sets the entrance or initial position of the Escapist inside the maze. The second sets the exit of the maze to which the Escapist must make his or her way. The third puck is used to commit the various shapes, walls and corridors, which the Designer creates and activates them inside the game.

Two things happen when this puck is placed. The game software first verifies that there is actually a valid path be-

tween the entrance and the exit so the Escapist has a chance of reaching the exit. Second, it commits the position and shape of walls and sends those walls into the game space so that they become visible to the Escapist.

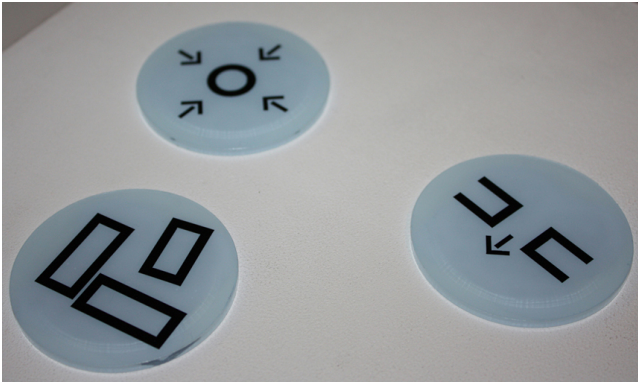


Figure 2: Pucks used by the Designer, entrance (top), modify maze (left), exit (right).

2.1.3 Valid Paths

If the designer attempts to create a maze with no solution a message is projected on the table to change it in such a way that allows a chance to escape. Once validated the game starts, a 30 second countdown begins and the position of the Escapist is projected on the table. The Designer knows all the time where the other player is and is able to change the maze during the game.

2.2 The Escapist

The Escapist is not allowed to see the shape or form of the maze. When one is designed and validated the game starts, the Escapist appears inside a 3D maze and can see it in a subjective perspective.



Figure 3: Escapist

2.2.1 Physical Interface

The Escapist uses a floor pad which provides a physical interface for moving throughout the maze, interaction is strictly limited to moving throughout the maze. The Escapist is able to see the maze from a projection on the wall. The Escapist's goal is to reach the exit in time.

3. GAME BALANCE

3.1 Different Game Modes

Having such different game modes in the roles of the Designer and the Escapist makes game balance a key factor. For the Designer to have control over the game space, there needed to be some kind of cost for him. But if the Designer were not be able to add and remove walls during the game his activity would be limited to design a maze as complex as possible and then simply sit back and watch the Escapist navigate the maze.

So the changes of the maze during the game are important but without any restriction *The Maze EV* could be considered as "unfair design" [5], an interesting concept but not the overall focus of this project.

3.1.1 Restrictions, Advantages & Hints

There are a number restrictions that try to provide balance between both players: 1) The number of walls and their width limit the maximum complexity of the maze 2) The diameter of the pucks assures that when the game starts there is at least some space between the Escapist and the closest walls 3) Each time the Designer adds or removes a wall the other player gets some extra time. 4) As new walls are placed, they appear to fall from above, so the Escapist is often able to run underneath them 5) The Escapist's overall speed is quite high 6) The Escapist is given hints on which direction to go. Light comes from the exit and sound gets more intense as he gets closer.

4. FUTURE DIRECTION

We are interested in exploring possibilities for improving game balance, like limiting the number of times that the maze could be modified by the Designer or introducing the ability for the Designer to only see the position of the Escapist at key moments.

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