Mammoth Stickman plays Tetris: whole body interaction with large displays at an outdoor public art event

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Abstract

We discuss our experiences running a large interactive exhibit called Tweetris. Tweetris incorporates whole body interaction with large projected displays in a public setting. We highlight aspects of crowd engagement, particularly the impact of the exhibit's layout on engagement patterns, and aspects of the exhibit's design that encouraged playful interaction between audience and "players".

Author Keywords

Whole body interaction; Tetris; Twitter; public installation; Kinect.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Tweetris is a lighthearted whole-body interactive exhibit employing a game-within-a-game concept (see Figure 1). In the *shape-matching* game, players compete to make Tetris shapes (tetrominos) with their bodies. Snapshots of players making these shapes are tweeted, then used as tetrominos in a life sized game of Tetris, where players control the placement of
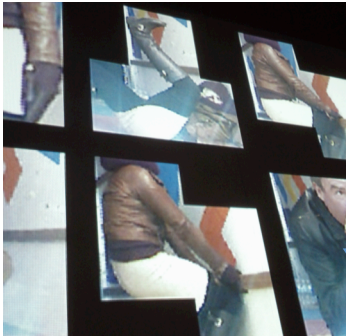
One: Shapes are made.

Two: Shapes are tweeted.
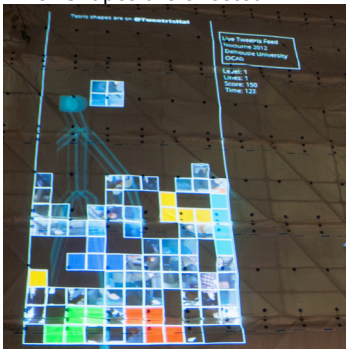
Three: Shapes are fed into giant body-controlled Tetris.

tetrominos with *their* bodies. The same tetrominos are made available to use in an online/mobile game of Tetris.

Tweetris is a collaboration between HCI researchers at Dalhousie University and University of Toronto, and digital media artists, researchers and designers at OCAD University. It has been successfully exhibited at public art events, and academic and industry conferences, most recently taking the artist award among 84 exhibits at Nocturne in Halifax, Canada.

Building on traditions like charades, and games like Twister and Hole in the Wall, Tweetris provides a venue for using the body to engage in social creative expression, friendly competition, and even lighthearted public embarrassment. Tweetris explores what it means to engage in a public interactive game. Players are not only contorting in front of an audience: shape matchers serve as game pieces on the Tetris board, are placed on a public Twitter feed, and used in an online game, while Tetris players drive a 30-foot stickman watched by crowds of onlookers and curious passers-by.

Figure 1. The Tweetris installation at Nocturne 2012, Halifax Canada.

Shape Matching

In the shape matching game, two players entered a van, where they viewed a video mirror image of themselves. Translucent tetrominos appeared on the video image (one for each player), and the players raced to fit their bodies inside the shapes. As a shape was made successfully a snapshot was taken of the player, to be used in the rest of the exhibit. The first player to reach 10 successful shapes "won". The shape matching game is described in more detail in [1].

Tetris Wall

In the second game, individual players moved their body to control a game of Tetris. The game was projected onto a white tarp covering a building face, on a busy street, giving a 30-foot game board visible from about 1 block away. The tetrominos are a mix of coloured blocks and the shape-images made in the shape matching game. Moving from left to right moved the active tetromino in the same way, crouching down on the ground caused the tetromino to speed its descent, and using the arms to make a broad rotating motion clockwise or counterclockwise caused the tetromino to rotate in the same direction.

Exhibit Layout and Crowd Engagement

In Figure 2 we show a labeled top-down view of the exhibit area. Lainer and Wagner [2] provide a set of primitives for describing a space in terms of social impacts that are useful for this discussion. Dotted lines in the figure indicate *social transverses:* the circular regions are areas of common activity, while the arcs show paths between regions. We use the terms *region* and *path* instead of transverse here to avoid confusion.

The dotted regions grow and shrink in the *intermediate spaces* around them as crowd size changes. The viewpoints (or *vistas*) between regions influence engagement patterns and overall cohesion. Attributes of the physical setting combine with the placement of media and play spaces to suggest *transformation layers* delineating regions.
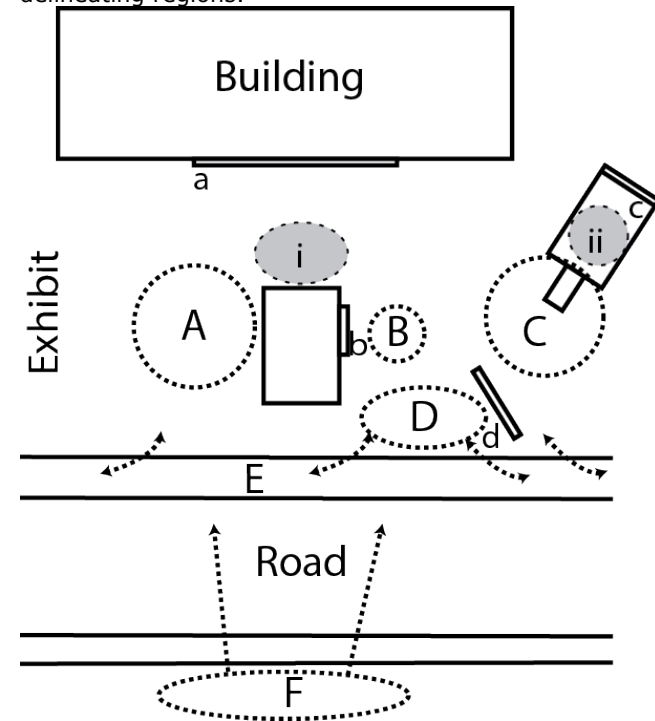

Figure 2. Exhibit layout and engagement patterns. Region *A*: Tetris game crowd. Region B: Twitter feed crowd. Region C: Shape matching crowd. Region D: Overview crowd. Region E: Passers by. Region F: Tetris watchers. Region i: Tetris play space. Region ii: Shape matching play space.
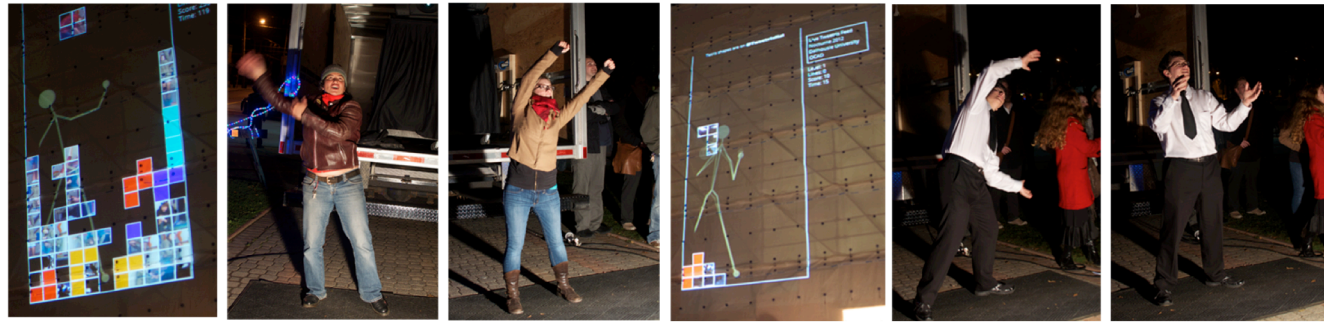
Figure 3: Playing the shape matching game.

Figure 4: Playing the Tetris game.

As people approach they have three possible paths into the exhibit. The first (leftmost in Figure 2) leads them to region A. In this space the Tetris game was clearly visible (display a) as was the play area for the game (region i). The rest of the exhibit was not easily visible from this point. Volunteers for the Tetris game were taken from this region.

The second path leads into region D. This was a popular entrance point, with a good viewpoint (*vista*) from which to read the exhibit introduction (kiosk d), watch the Tetris game (display a), and see the TwitPic feed (display b). Moving into the exhibit allowed visitors to also see the shape matching game (display c). In region D attendees were often heard trying to understand how the parts were connected, or explaining how they were connected to others.

The third entrance path opens into region C. In this region many were focused on the local event (the shape matching game inside the van), forming an oblong ellipse around the entrance to the van to watch, and forming a line down the middle to participate. Because of the viewpoint, however, some attendees in this region also watched the Tetris game.

In the middle of the exhibit was region B, where the live TwitPic feed was displayed (display b). Shape matching game players often migrated to this area to see their images appear on the feed, and to watch the Tetris game. These players would occasionally call out

when they saw their images appear as tetrominos on the Tetris game.

The road imposed a strict limit on the exhibit region, but also created a distinct area for "Tetris watchers" (region F). At times this area was crowded with onlookers, who snapped photos and talked casually about the Tetris game. The road served as a clear boundary between direct engagement and observation. Observation at this distance was only possible due to the very large screen—this is in contrast with a smaller screen, which, like a busker, requires proximity and carries the potential of being "drawn into the show".

We label the nearest sidewalk region E, because we saw a particular kind of engagement in this space. Some passers-by would often casually look, slow down, even stop for a minute on the sidewalk, but would not leave the sidewalk—maintaining a clear social cue of the ability to disengage at any moment.

The A/V van housing the large screen projector (shown as a rectangle in the center of Figure 2) had a large effect on the social experience of the exhibit, illustrating how critical layout choices are to the experience of large scale public interactive exhibits. First, it effectively separated region A from the rest of the exhibit, making the Tetris players a somewhat separate group, while visitors more fluidly transitioned between regions B, C, and D. Relatively few people walked in front of the large projector to get to region A

(even though the projected region was considerably above their heads), and others simply didn't see the crowd in region A from the other side of the A/V van.

The van also blocked the Tetris play space (region i) from view for onlookers further away, particularly in region F. This created an experience where these onlookers could see the indirect effect of whole body interaction on the movement of the Tetris pieces, while also seeing its direct manifestation in the stickman superimposed on the game area. These elements combined to create a puzzle for onlookers to figure out. Some thought the stickman was pushing and rotating blocks with his hands, while others picked up on the correlation between poses and tetromino movements. We provided a smaller video feed of the player (life sized) to the right of the game area, which onlookers would sometimes refer to in conversation with each other as they tried to decipher what they were seeing. The shape matching game couldn't be seen from this viewpoint—one onlooker noted that the blocks seemed to be images, but she didn't know what of.

Game Design and Crowd Engagement

Both games permitted playful experimentation, increasing crowd interest and engagement. By only requiring that a shape be matched (but not how) in the shape matching game, we saw many examples of odd/difficult contortions when making shapes (see Figure 3). In the Tetris game, the rotation action was difficult to achieve–this led to some comical experimentation. One attendee even turned cartwheels to rotate the pieces.

The sheer scale of the Tetris display meant that the Tetris game captured most of the crowd's attention in the Nocturne event. Loud communal "oohs" and "aaahs" and shouted suggestions were heard throughout the event as tetrominos were moved into good or bad positions. In a prior Tweetris exhibit, the shape matching game was in its own setting—garnering similar attention albeit from a smaller crowd.

The human tetrominos had more appeal as personal tokens—groups of friends would laugh together when seeing them on the TwitPic feed or Tetris gameboard—rather than having appeal to the larger audience. Making the images larger and clearer may change this.

Even though many attendees couldn't see the Tetris player, a sense of connection was created through the medium of the game screen, and players appeared to enjoy the audience. We would like to further explore the role of the stickman in contributing to this.

Conclusion

We clearly see the influence of both the local environment, media placement, and interaction design on the way the audience engaged with Tweetris. We hope to engage with others at the workshop to explore ways of studying these effects in future work.

Acknowledgements

References

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