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Move It Like Picasso: A Flexible Platform to Combine Movement, Drawing, and Communicative Play

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ABSTRACT

Tangible and embodied explorations have delivered many designs to rejuvenate many traditional leisure activities such as parlor games, and dancing, and offered ideas on how to bridge inter-generational divides through play, and allow players of different skill levels to compete relatively equally. However there seem to be few examples of designs for non-competitive play which allow participants to take very different roles. Bringing together elements of playing with dance, communication, and drawing, we present the Move It Like Picasso platform. This facilitates a collaboration between a player trying to physically trace flickering lines from an animation which are unpredictably triggered by the second player’s bodily movements. We offer this as an example of how combining simple digital technologies and everyday physical materials may offer a route to rich social play experiences that might simultaneously appeal to a wide range of tastes.

CCS CONCEPTS

• Human-centered computing → Collaborative and social computing: Interaction design.

KEYWORDS

Collaborative Games, Social Play, Party Games, Embodied Interaction, Whole Boded Interaction, Sketching Games

1 INTRODUCTION

One of many benefits argued for tangible and embodied interactions is fostering social experiences and collaboration [2, 8, 9]. Digital interactivity in combination with physical activities offers great opportunities for cooperative play [5] and many other social pastimes. Sensors and interactive media can augment all kinds of shared leisure pursuits from skateboarding [6], and rock climbing to knitting [1] and board games [7]. Most designs however focus on supporting a single activity and often assume similar interests, abilities and skill levels among their users. For instance, even dance platform games like YaMove! [3] that have a careful focus on the shared social experience of their users requires players to be attracted to making rhythmical movement and have broadly similar physical energy and capabilities as their dance partners and competitors. In the following, we present "Move It Like Picasso" - a novel platform for collaborative physical-digital play that offers players and spectators opportunities to participate with different ways regardless of whether the context is a special event, or a more mundane context equipped only with standard computer monitor or TV screen.

2 THE DESIGN

In brief, Move It Like Picasso comprised simple line animations triggered by the movement of one player (that we call the "mover") that the second user (that we call the drawing player) tries to trace with a marker pen onto one surface of a multilayered screen (figure 1). As neither player knows what the lines depict, but through their combined efforts in dancing and drawing respectively, they may eventually "freeze" the animation and reveal a complete image.

2.1 The animation

The outline of various famous painting were traced in monochrome and then the different lines from this tracing were cut up into many separate image files. For example, an outline of Vincent Van Gogh’s The Starry Night (1989) was transformed into 24 images, each showing a single line. Every image file showed a portion of tracing. E.g. one image represented the silhouette of the church, another file showed the silhouette of a cypress tree (figure 2), other image files displayed a different expressionistic swirling line, and so on.
Figure 1: Schematic to show components of Move It Like Picasso set up using a standard monitor. Plugged into left hand side of laptop (top left) is the receiver of accelerometer data from the microcontroller worn on a fabric band (left middle). The animations of the famous painting outlines are displayed one-at-time on the monitor (top right). A large paper is suitably mounted on front of the monitor to allow the drawing player to trace the outline. The optional headphones (bottom left) offer the option to enforce possible rules restricting verbal communication between players.

Figure 2: Two of the 24 image files traced from Van Gogh’s Starry Night. Some lines were quite long such as the tree (on the left) and a cloud outline (right).

These portions of the painting’s outline became the basis for an animation that could display one line from the picture at a time in an unpredictable order.

2.2 The mover
This player wears a waist belt onto which is loosely tied BBC micro:bit microcontroller. Accelerometer data from the micro:bit is continuously wirelessly transmitted to a nearby laptop. Depending on the bodily position of the mover, Max MSP software [4] on the laptop outputs a different frame of the animation, one tracing line at a time, to the multi-layered canvas. The mapping between accelerometer data and which line is displayed is deliberately unpredictable, and the apparent randomness of the mapping is increased by the looseness of the sensor on the belt. This results in a flickering display of portions of the overall image that the mover finds difficult to pause, let alone control. To encourage the mover’s explorative movements, and add to the general ambience, popular dance music is played over speakers.

2.3 The canvas
The canvas can be set up in two main ways. If a plain glass wall or door is available either, then a projector can backlight the projection or any other computer monitor. If using a projector, a sheet of flip chart paper is temporarily, but securely hung (e.g., using sticky tape or adhesive putty) on the opposite surface of the glass to the projector. If using a computer monitor or other self-illuminating screen, a sheet of transparent waterproof material (e.g., thin clear acetate) is similarly stuck to the frame of the monitor, and then a sheet of paper is stuck to the outer surface of this screen cover. In both cases, the brightness of the screen relative to the thinness of the paper should result in images output by the laptop being clearly visible through the paper.

2.4 The drawing player
This player has the challenge of trying to capture all the dynamically displayed lines in different frames of the animation in order to reveal to both players (and any spectators) which famous painting is depicted in outlines. The drawing player uses a dry-wipe marker to trace the outlines as they appeared. The unpredictable, flickering quality of the animation, and the diversity of shapes displayed, means this player needs to react fast in order to trace every outline. The drawing player and the mover should only communicate with gestures. In our initial set-up, using back projection, the mover was in a glass-walled room and thus sonically isolated from the drawing player outside the room. If playing with this “no speaking” rule in other setups, this rule can be implemented either voluntarily or via deploying headphones or louder backing music.

3 FUTURE WORK
Future work includes exploring different styles of visuals as the basis for line making and understanding better the possibilities of providing different options in terms of the number and size of the lines that are traced, and the balance between more logical or random mappings between body position of the “mover” and the sequence of line extracts they trigger the display of. Furthermore, the positive appraisal of the play by spectators suggests that there is great potential for involving more than two active players (e.g., collaborative body movements as triggers of the outline displays or multiple marker pens to allow multiple drawing players simultaneously). But our initial informal tests of multi-player conditions indicate that this is rather complex. We have seen that communication between players with the same role can overshadow the necessary, but humorous communication between the different roles which is a very attractive part of the social play experience in the basic two-player version.

REFERENCES
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