intangle: Exploring Interpersonal Bodily Interactions through Sharing Controllers

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ABSTRACT

Multi-player computer games are increasingly being designed to engage with interpersonal bodily interactions, however, their focus is often limited to facilitating direct body contact. In contrast, we propose that designers foster varying levels of body contact through the design of shared controller interactions to introduce new types of gameplay that affords players a more nuanced engagement with the concept of socially and personally mediated body-space in games. We explore this through our game *intangle*, where participants follow computer-generated vocal instructions on how to operate shared controllers that results inevitably into players weaving their bodies together. This game embeds strong social values in the gameplay such as collaboration, empathy and inclusivity.

Author Keywords

Whole-body interaction; bodily play; game design; agency; engagement; ambiguity; proxemics; social values

ACM Classification Keywords

H.5.2. Information interfaces and presentation (e.g., HCI): Interaction Styles.

INTRODUCTION

HCI and games increasingly place the body at the forefront of the interaction, drawing inspiration from research on embodiment [2] and proxemics [6]. This corresponds with an emerging shift towards engaging with interpersonal bodily interactions in digital games in order to create new, unexpected and engaging experiences, as seen in games like *Musical Embrace* [8] and *JS Joust* [10]. While digital games that involve physical movements typically have each player's controller interacted with by only one player, we see an opportunity to explore the design of shared controller interactions. We present our game *intangle* as a research vehicle to explore the design of shared controllers to encourage interpersonal bodily interactions between players to occur gradually through the trajectory of a play experience. We further propose that the ambiguity resulting from players' contact forces onto a shared controller can be a valuable resource for designers to know about.
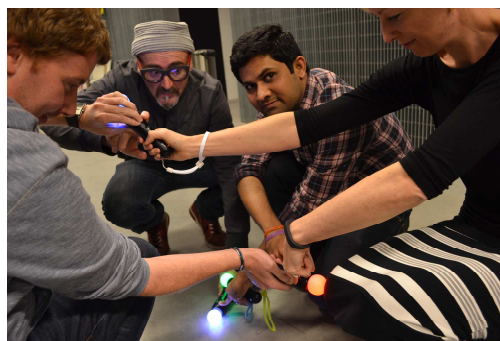
Figure 1: Playing *intangle*

INTANGLE

intangle (Figure 1) is a collaborative game involving a group of four or more players, where each player is given a Sony Move controller. Each player's controller shows a different colored LED light to illustrate his or her role, for instance "red player" is the player whose controller displays a red light. Gameplay involves the game giving the group procedures via a series of computer-generated vocal instructions, which must be then carried out. For example, players might hear, "Two players press a button on someone else's controller". The group has to complete each instruction to progress. Time constraints are enforced by the game, with visual, auditory and haptic sources of feedback given via the controller's light and vibration as well as beeping sounds, to alert everyone that the time to complete the current instruction is nearly up. Upon completing an instruction on time, the group is given the next instruction, however they must also continue to fulfill the requirements of the previous instructions, otherwise the game will end. The game also gives feedback if these requirements are not fulfilled. For example, if a button is no longer held down on one of the controllers, that controller will flash and vibrate. The game gives a moment of time for someone to push back down the button, otherwise the game will end. Players gradually become more entangled with one another as more and more buttons are pressed down. Over the course of the game, a more complex range of procedures is introduced, like crouching down or placing a controller onto the floor.

DISCUSSION

We focus the discussion of our design experiences with *intangle* on the intersection of two key themes for designing games that facilitate interpersonal bodily interactions through shared controllers: body contact and ambiguity.

Facilitating varying levels of body contact to occur through the trajectory of a play experience

Body contact can be an outcome of shared controller experiences. In body-space games [7] we can often find a continuum between 'up-close and personal' contact, to games where contact is used sparingly. For example, *Musical Embrace* [8] explores uncomfortable interactions as players squeeze a shared pillow to progress through the game. In *JS Joust* [10], a player intentionally keeps out of reach of other players until they can see an opportunity to strike the other's controllers. However, the amount of body contact in these games is always imposed by the rules of the game. Instead, in *intangle* we suggest that varied actions can encourage different amounts of body contact, for example, one action might be, "Put white controller in someone's pocket", whereas another might be "Everyone, jump together". This variation could allow players to regain personal space, or more provocatively seize an opportunity and find themselves closer to another player. We observed that gameplay often started with little to no body contact being experienced during the early stages, however over time we made it progressively more challenging for the players to avoid body contact as bodies become entangled and controllers harder to reach, often resulting in body contact occurring indirectly. As the experience reached its climax, we gave some instructions where body contact was a more direct outcome, like "two players touch someone else's leg with their controllers". In our early evaluation of playtests held during our game jam design process [1], we find *intangle* encourages players to playfully and safely test social and personal boundaries of contact through game play. We allow room for these explorations to occur by inviting rather than enforcing body contact. This can allow players to decide upon the level of body contact that feels personally comfortable; this important distinction in the rules can give players a greater sense of agency as players configure the rules of engagement on their own individual terms. The game's premise of agency is partially informed by self-determination theory (SDT), which posits human needs for autonomy, competence and relatedness as crucial to motivation [9]. In our game, agency is a social value set within the objectives of having fun, building connections among players and meaning making. We designed *intangle* so players could gradually engage with a full extent of this continuum of contact over the trajectory of the experience.

Utilizing ambiguity from contact force onto controllers to engage players with each other's movements

As ambiguity in the design of interactive systems can encourage thoughtful reflection on interactions with technology [5] and stimulate engagement with digital bodily play [4], we believe that ambiguity can enable opportunities for new types of engaging gameplay experiences. Through our design experiences with *intangle* we propose that the ambiguity of contact force can be a useful design resource for designers of shared controller experiences. We use contact force to describe the physical force in which a person or object comes in contact with another person or object.

Contact forces are responsible for most interpersonal bodily interactions between people and with people and objects, such as kicking a ball to another player. Interpersonal bodily interactions in digital games typically occur with gamepads or touchscreens most often situated in fixed and stable positions (e.g. *Fingle* [3]) or have these forces applied directly to another's body, (e.g. *Musical Embrace* [8]). However, with *intangle* the players must apply bodily pressure onto other players' controllers, rather than their own controllers or through direct contact with the body itself. The resulting contact forces introduce a sense of ambiguity that makes it more challenging for the group to keep the controllers (and thus one another's bodies) steady. This ambiguity becomes more apparent as the game progresses, when several players' contact forces become situated at the source of a single controller. In sum, we believe the ambiguity of contact force resulting from players' shared controller interactions has much potential for further game design research that is yet to be explored.

CONCLUSION

We presented *intangle* as a research vehicle to explore body contact and ambiguity as two key design themes for shared controller experiences. By providing an initial understanding of how designers can engage with interpersonal bodily interactions through a shared controller to design engaging gameplay experiences, we believe we can extend our knowledge on concepts such as proxemics and ambiguity for the benefit of engaging a form of game design that integrates a variety of social values in the gameplay, which the conceptual category of 'agency' engenders. Ultimately, we aim to expand the range of shared bodily play in order to better understand how to foster meaningful connections between players.

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