Little VR Pet Shop: A Reverse Turing Multiplayer Virtual Reality Game

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EXTENDED ABSTRACT

We present *Little VR Pet Shop*, a virtual reality (VR) game for two players using head mounted displays (HMD). One of the difficulties that designers face in developing games for VR is in finding control schemes that are both intuitive and integrated with the VR experience. Traditionally, games rely on input devices like a keyboard or gamepad, both of which are problematic when used in conjunction with HMD's. In addition to the fact that players cannot directly look at the input devices, their physical actions tend to share little similarity with the resulting in-game actions. This disconnect can be difficult especially for people unfamiliar with traditional game controls. Recent HMD's such as the *HTC Vive* add wireless controllers and sensors to provide motion tracking. While this offers the potential for more intuitive controls, it also introduces other challenges such as a more complicated setup, as well as the requirement of a large space to safely play.

Little VR Petshop was created with the purpose of exploring different control schemes and suitable metaphors for games controlled through head movements. In the game, players enter a shared virtual environment (the titular pet shop) using two *Google Cardboards*; a low-cost HMD that uses smartphones to provide head tracking as well as stereoscopic view. In the game (see Figure 1), one player assumes the role of the 'mysterious stranger', a human character looking to pick up a pet, while the other player takes control over one of the animals in the shop (either a dog or a fish). As a human character, the player is tasked with finding the other player among seven AI controlled animals by looking for tell-tale signs that a computer is unlikely to exhibit. Conversely, the animal player needs to blend in with the other animals as much as possible to avoid being picked by the human player. Human players have a time limit of five minutes before they must make a choice. The short duration of each game round lends itself to frequent changes in player roles, which in turn promotes a trial and error approach to coming up with new gameplay strategies.

As mentioned before, the main goal in developing this game was to experiment with different head motion control schemes, which were partly based on prior research (Lyon 2014;

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Figure 1: Screenshot of the game environment (left) and the three player characters (right)

Fuhrmann et al. 1998). The human control scheme uses visual markers in the virtual environment which indicate the action that will be executed upon using the magnet trigger on the *Google Cardboard*. To walk, human players look at any spot on the ground and press the trigger. The dog control scheme asks players to tilt their heads towards the ground, while looking in the direction they want to move. This form of control was meant to represent a dog sniffing on the ground; a metaphor that was further emphasized through appropriate sound effects. The fish control scheme requires players to perform slow sideways shaking motions to move towards where they are looking, simulating the swimming movements of a fish.

The game and its control schemes were tested over the course of two user testing iterations with a total of 68 participants. Through the combination of a questionnaire and a semi-structured discussion, we found that the human control scheme was deemed the most comfortable form of navigation. Various factors contributed to this fact, one example being that fish players frequently reported that they did not feel fully in control of their movements while the human control was very accurate. The fish control scheme was, however, rated the most entertaining. In general the game was very well received, even by people who did not consider themselves to be gamers. It was in fact those participants that got used to the controls relatively fast, while more 'traditional' gamers would expect a control scheme known to them and took longer to figure out the head tracking controls. In our second testing iteration we introduced the question of whether players would play again, which was answered with 'yes' by 94.1%. Finally, many players were positively surprised by the visual fidelity and responsiveness of the head tracking, given the evident simplicity of the HMD. These results are encouraging in two ways. One, that developers can create interesting VR experiences with limited equipment. And two, that head controls can successfully engage players that might not have considered themselves interested in or capable of participating in digital games.

BIBLIOGRAPHY

Fuhrmann, Anton, Dieter Schmalstieg, and Michael Gervautz. 1998. *Strolling through cyberspace with your hands in your pockets: head directed navigation in virtual environments.* Springer.

Lyon, Phillip A. 2014. "Head Motion Controls for 3D Head Mounted Display Games." Master's thesis, Drexel University.