

| MDA framework (Furukawa et al. 2003) | | | | | | | | | | | | | | |
|--------------------------------------|---|---|--|------|----------|--|--|--------------------------------|---------------------------|---|---|---|-------------------------------------|------------------------------|
| Index | Title | Link to the paper | Author | Year | Database | Notes | Sensation (Game as sense perception) | Fantasy (Game as make-believe) | Narrative (Game as drama) | Challenge (Game as obstacle course) | Fellowship (Game as social framework) | Discovery (Game as uncharted territory) | Expression (Game as self-discovery) | Submission (Game as pastime) |
| 18 | FaceDisplay: Towards asymmetric multi-user interaction for noncubic virtual reality | https://doi.org/10.1145/3379294.3379294 | Gugeshwar, A. and Shamsan, E. and Saeem, H. and Rabala, E. | 2018 | Scopus | <p>"However, since this form of interaction would only occur within a certain social familiarity, the Non-HMD user constantly balanced this out, resulting in a high level of enjoyment for both users (see GEO, SAM, Valencia)."</p> <p>"The physical interaction was overall used by the HMD User to somehow balance out the power level. When asked directly about the level of discomfort when touching the screen or being touched, participants reported a significantly higher level of discomfort compared to the gestural interaction (see Fig. 8). However, when looking at the level of enjoyment (see GEO, SAM, Valencia) participants accepted this discomfort as part of the experience. Impact of a comfort on the left and right was considered being "bounced" due to their social connection to the Non-HMD User. Despite being unconventional at first sight, we argue that touch interaction for FaceDisplay can lead to an immersive and enjoyable experience when played with a closely familiar partner."</p> <p>"Enjoyment, presence and emotion: Overall, the majority of participants reported they had fun during the study and generally liked both game concepts. Since our goal was to include the Non-HMD User into the virtual environment and experience of the HMD User, we consider these high levels of enjoyment and presence to be a positive outcome. The Non-HMD User had an even higher level of agency of the interaction and a higher level of understanding of the virtual environment (see Fig. 8). The different interaction approaches (touch and gestures) had no significant impact on the experience and can therefore both be used according to the envisioned experience."</p> | | | | <p>"We found that the concept of FaceDisplay resulted in a highly imbalanced power level between HMD User and Non-HMD User (see SAM, Valencia, GEO, empathy, negative feelings). The Non-HMD User can either abuse this (e.g., specifically or even up to a higher level of responsibility (e.g., Conductor). This power level arises from the fact that the Non-HMD User can now use the virtual environment and the HMD User, whereas the HMD User only sees the Non-HMD User when he decides to show himself. This means the power could potentially be abused and impact the experience of the HMD User. However, since this form of interaction would only occur within a certain social familiarity, the Non-HMD User constantly balanced this out, resulting in a high level of enjoyment for both users (see GEO, SAM, Valencia)."</p> <p>Social Interaction: The social presence module of the GEO consists of three subcategories: empathy, negative feelings and behavioral involvement. Participants reported significantly (F(1,15) = 7.889, p < .05) more empathy playing Conductor (M=2.70, SD=1.53) than playing SpaceFace (M=2.03, SD=0.75) and significantly (F(1,15) = 8.881, p < .05) more empathy playing as the Non-HMD User (M=2.5, SD=0.93) than playing as the HMD User (M=2.25, SD=0.77). Participants also reported significantly (F(1,15)=47.452, p<.001) more negative feelings playing SpaceFace (M=2.24, SD=.03) than Conductor (M=1.01, SD=0.25), it is interesting that these negative feelings did not reflect negatively on the enjoyment."</p> | | | | |
| 19 | Robotic Self-Overlapping Virtual Reality Maze and Map Visualization Demo: Public Virtual Reality Setup for Asymmetric Collaboration | https://doi.org/10.1145/3379294.3379294 | Derdagh, Sule and Muratovic, Senja and Eren, Naci and Murtin, Martin | 2017 | ACM | | "the setup was capable of facilitating asymmetric collaboration with non-HMD bystanders. With guidance, the maze was more engaging and could be completed in shorter time. Without guidance, some participants were not able to reach the end of the maze." | | | | "the setup was capable of facilitating asymmetric collaboration with non-HMD bystanders. With guidance, the maze was more engaging and could be completed in shorter time. Without guidance, some participants were not able to reach the end of the maze." | | | |
| Added via Snowball Approach | | | | | | | | | | | | | | |
| 20 | Maze Commander: A Collaborative Asymmetric Game Using the Oculus Rift & the Siles Cubes | https://doi.org/10.1155/2018/2742024 | Peyman Bajgati, Edgar Orta Colchagua, Oudizma, Randa, Tullerama, and Olga De Trigo | 2014 | ACM | <p>The good score on positive affect was also observed during the play sessions. Participants had fun, they laughed, made jokes, and expressed their excitement verbally.</p> <p>We could clearly observe the excitement-together matrix where participants verbally expressed joy, and bodily expressions were noticed between play sessions and when accomplishing the challenges of the game.</p> <p>We did not found any significant difference between the game experience of the Siles Cubes and the Oculus Rift within the two evaluation sessions. The results of the conducted t-test for both evaluation sessions are given in Table 1. This means that players experienced an equal level of game satisfaction.</p> | | | | <p>Note that the lowest possible value is 1 since the results are based on a 5-point Likert scale. We can observe a positive evaluation for flow and challenge where competence is maximal. According to Csikszentmihalyi [3], a good game design should include closely related values of competence and challenge in order to keep the player in the flow of a game. As illustrated in Figure 5, we have achieved a positive flow by the flow value itself and by the 252 internal difference between competence and challenge.</p> | <p>On the other hand, the positive score for the empathy factor illustrates that players found it, among others, enjoyable to play with each other.</p> | | | |
| 21 | FaceDisplay: Enabling Multi-User | https://doi.org/10.1145/3379294.3379294 | Gugeshwar, A. Shamsan, E. Saeem, H. and Rabala, E. | 2017 | ACM | | | | | | | | | |
| 22 | Designing Shared Virtual Reality | https://doi.org/10.1145/3379294.3379294 | Shafar, Liabo, Marc Masuch | 2016 | Scopus | | "Playtest sessions were character-ised by vivid game-related communication and deeply focused, engaged play. We assume that the players experienced high levels of immersion and social presence and an overall positive shared VRGX." | | | | | | | |
| 23 | SpaceRoom: Perspectives for Collaboration | https://doi.org/10.1145/3379294.3379294 | Michael Schmitz, Marc Masuch, Dorine Zentle | 2015 | ACM | | <p>Especially families with children enjoyed the game, due to its inclusive and intuitive movement-based interaction. Most of the players tried the game more than once. Because the difficulty level was not well-balanced, none of the teams succeeded to bring the ship to its final destination.</p> <p>"As players, participants rated their experience on average as 6.1 (SD=0.3) on a 7-point Likert scale (1=completely, 7=perfectly) – so clearly as enjoyable. Overall, players preferred the large motion events. Five players stated that they liked the intense motion result, i.e. from lifting, aiming and bombing. Another player stated that he particularly enjoyed whole-body movements, such as being lifted or being swung forward – more so than being lifted and rolled. Along the same lines, three participants stated that they did not enjoy the extensive landing period in which they were lifted down. One participant described lifting as uncomfortable. Accordingly, when asked about the most impressive one, most of their player experience, 11 participants picked the intense 1+2 boost caused by the bombs. One player expressed that "the changes in attitude were amazing and immersive". Another player explained that he enjoyed the moment when he bumped into the ship's."</p> <p>"As actors, participants rated the experience as actor as less enjoyable than as players, yet still on the "enjoyable" side (M=4.4, SD=1.2). Very obviously, the actors' experience was strongly driven by their perception of player experience. Actors felt that their performance contributed to player's experience (M=4.4, SD=1.3) (the "contribution" in Figure 25). Our observations match this. Five actors said that they enjoyed seeing their players (screen and riggle. One actor, for said "It's fun to play this with your friends and see their reactions as they play" and one simply stated "It's fun to watch". One participant would have enjoyed an even better view of what the player is experiencing. While we thought of the special effects one as being less exciting, one actor, for said he would have also liked to take on that role. The most likely reason for the lower score on enjoyment was fatigue. Seven actors mentioned fatigue. One actor mentioned that fatigue kicks in after two months of working. Another actor said "The person we moved was too heavy for me and I was smaller than the other players so my arms and at a lower height". Two actors mentioned that lifting the player to level +2 repeatedly had caused fatigue."</p> | | | | <p>"Assigning identifiable roles to certain players allows the game designer to equip each individual player with special abilities, tasks and objectives. Information about the current game state, and even on the virtual game world. This is a prerequisite to establish multi-task dependencies between all players. Depending on the structure of interaction between the players and the game system [5] this asymmetric distribution of abilities and information can force players either to collaborate or to compete. The result are complex and dynamic game-related interactions, which make the shared gaming experience unique. Giving players the opportunity to choose roles that fit their individual play styles enhances the gaming experience and strengthens the player's involvement."</p> <p>"To learn more about prosaemics, we asked participants who they would play best fight with. They indicated that they would play with Hermes (1/4) and Jerry (10/14), but only 1/14 felt it was appropriate to play with the public. Given that this study had several participants to play with a group of many strangers, this suggests that subjective satisfaction may improve further if experienced in a closer circle of friends and family. One participant explicitly said that she would enjoy playing her/his task with her kids. The human-factor nature of haptic task perceived participants. While 1/14 participants responded that they would have preferred an experience determined by a mechanical motor platform, 1/14 stated that they preferred being acted by humans (Figure 25)."</p> | | | |
| 24 | Haptic Turk: A MotionPlatform Based on People | https://doi.org/10.1145/3379294.3379294 | Lung-Pin Cheng, Patrick Lohse, Pedro Lopez, Christoph Reier, and Patrick Baudisch | 2014 | ACM | | | | | | | | | |
| 25 | UbikBeam++ Augmenting Interactive Projection with Head-Mounted Displays | https://doi.org/10.1145/3379294.3379294 | Pascal Kriemert, Markus Fork, Thomas Koch, Anton Felsch, Simon Mohr, Benjamin Muehl, Marc Wiese, and Alexander Schmitt | 2016 | ACM | | Qualitative feedback we collected indicates that participants appreciated the general idea of augmenting interactive projection with HMDs using UbikBeam++. | | | | Qualitative feedback we collected indicates that participants appreciated the general idea of augmenting interactive projection with HMDs using UbikBeam++. We observed that participants were understanding the concept of shared, public and private content very quickly. | | | |