

Embodied Representations in Games: An Analysis of Avatar Form and Movement for the Design of Immersive Experiences

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This paper will examine the representational mechanisms of embodiment employed to represent avatars in games, and the ways in which they can affect the players' embodied experience in the light of (co)presence. Quasi-corporeal agents (hereafter referred to as 'avatars') are perceived as vehicles of human presence that exhibit a set of embodied characteristics (Soeffner C Chang, 2007). Avatars may influence various aspects of the player's behaviour - as per, for instance, Calleja's (2011) model of involvement (which includes aspects such as kinaesthetic, spatial, and shared involvement), and 'the Proteus Effect' (Yee C Bailenson, 2007; Liu, 2023). The manner in which an avatar is represented can affect engagement, the sense of immersion, presence, and the performance of a player (Rahill C Sebrechts, 2021). Anthropomorphic avatars, for instance, can be regarded as characteristics of games with a significant impact on immersion (Paleczna et al., 2022), while less anthropomorphic avatars exhibiting sensorimotor and social skills can be perceived as co-present embodied entities (Mantovani C Castenuovo 2003). Avatar motion is a significant factor influencing the manner in which it is perceived; a less anthropomorphic avatar that moves in a realistic manner can have a greater impact on the sense of co-presence than an anthropomorphic avatar with less realistic sensorimotor skills (Casanueva C Blake, 2000). Additionally, a correlation between the extent of the representation of movements performed by an avatar and the extent to which players identify with the avatar has been postulated (Hamilton, 2009).

Previous research (Papasarantou C Gavrilou, 2014) has explored the representation of avatars in an abstract manner that denotes the sense of presence through various embodied qualities. This research focused on the field of choreography and the employed notational systems for representing bodies in motion. Through the analysis of William Forsyth's diagrams in "Synchronous Objects" (Synchronous Objects, 2007) and Matt Pyke's methods for representing traces of embodied entities in "Presence" video installation (Universal Everything, 2009), a number of guidelines for

representing embodied presence in an abstract manner were derived. Based on these guidelines, an avatar consisting of trails moving in a 3D virtual space was generated. This avatar was utilised as part of an experimental process designed to test its impact on users' embodied experience as a co-present embodied metaphor (Papasarantou C Rizopoulos, 2015). Findings indicated that this kind of representation, in conjunction with the use of embodied interaction techniques that relied on the users' embodied skills, could enhance their experience and blur the lines between virtuality and physicality.

This paper builds upon the existing framework by examining how embodied skills are represented in video games, aiming to enhance existing guidelines and the derived representational mechanisms on aspects that pertain to the design of embodied representations. From a historical point of view, virtually every game that is not entirely text-based includes embodied entities of one form or another (from the realistic to the abstract). Furthermore, the majority of third-person games provide a mostly humanoid avatar, while some games, such as *Stray* (BlueTwelve Studio, 2022), opt for non-humanoid representations. This study will attempt to apply the visual / diagrammatic language mentioned above to indicative games spanning various positions along the continuum ranging from completely abstract to completely realistic bodily representations, with the aim of highlighting the ways different representations of corporeal entities (in terms of both appearance and movement) can affect the embodied experience of players.

References

- Calleja, G. (2011). *In-game: From Immersion to Incorporation*. Cambridge, MA: MIT Press.
- Casanueva, J., and Blake, E. (2000) "The effects of group collaboration on presence in a collaborative virtual environment", *Proceedings of the 6th Eurographics conference on Virtual Environments*, Amsterdam, The Netherlands, June 01-02
- Hamilton, J. G. (2009) "Identifying with an avatar: a multidisciplinary perspective", *Proceedings of the Cumulus Conference: 38^o South: Hemispheric Shifts Across Learning, Teaching and Research*, Swinburne University of Technology and RMIT University, Melbourne, Australia, 12-14 November.
- Liu, Y. (2023). The Proteus Effect: Overview, Reflection, and Recommendations. *Games and Culture*. <https://doi.org/10.1177/15554120231202175>.
- Mantovani, F. and Castelnuovo, G. (2003) "Sense of presence in virtual training: Enhance skills acquisition and transfer of knowledge through learning experience in virtual environments", *Being There: Concepts, effects and measurement of user presence in synthetic environments*, G. Riva, F. Davide, W.A IJsselsteijn (Eds.) Jos Press, pp.168-180.
- Paleczna, M., Buczkowicz, P. and Szmigielska, B. (2022) "Player-avatar similarity and game experience: game efficacy, game enjoyment and immersion", *Polish Psychological Bulletin*, 53 (3), pp.193-202, doi: 10.24425/ppb.2022.141867
- Papasarantou C. and Gavrilou E. (2014) "Representational approaches of the notion of co-presence in mixed environments", in *proceedings of 8th Audiovisual Arts Festival and Scientific Symposium "Metamorphoses of corporeality: Art - Body - Technology"*, May 14-18, Corfu, pp. 118-150
- Papasarantou, C. and Rizopoulos, C. (2015) "Designing for Mixed Embodied Presence in a virtual setting", in Theona, I. C Charitos, D. (eds.), *Proceedings of the International Biennial Conference Hybrid City 2015: Data to the People*, pp. 298-305, https://spatialmedia.ntlab.gr/wp-content/uploads/2018/07/Hybrid-City-2015_Data-to-the-People.pdf

- Rahill, K.M. and Sebrechts, M.M. (2021) "Effects of Avatar player-similarity and player-construction on gaming performance", *Computers in Human Behavior Reports*, Vol 4, doi: <https://doi.org/10.1016/j.chbr.2021.100131>
- Soeffner, J., and Chang N. (2007) "Co-presence in shared virtual environments: avatars beyond the opposition of presence and representation", *HCI'07 Proceedings of the 12th international conference on HCI: interaction design and usability*, pp.949-958.
- Synchronous Objects (2007) Synchronous Objects for One Flat Thing reproduced, Available at: <https://synchronousobjects.osu.edu/> (Accessed 20 April 2024)
- Universal Everything (2009) *Universal Everything/ Artworks/ Presence*, Available at: <https://www.universaleverything.com/artworks/presence> (Accessed 20 April 2024)
- Yee N. C Bailenson J. (2007). The Proteus Effect: The Effect of Transformed Self-Representation on Behavior. *Human Communication Research*, 33(3), 271-290. <https://doi.org/10.1111/j.1468-2958.2007.00299.x>