## Social

Since presented in 2019 by Marcel et al. [1], Social VR has been defined as "a growing set of multiuser applications that enable people to interact with one another in virtual space through VR head - mounted displays. This theory can apply in many fields, but in learning environment it is difficult to ensure every student have a Head Mounted Display (HMD) for "share VR" in teaching environment. Previous research has emphasized the importance of social interactions in museums as they tend to contribute to collaborative learning through discussions, debates which lead to deeper reflections on the subject[2], so integrate social interactive into VR museum is necessary and it is part of our research, the VR museum by Yue et al.[3], are systems presenting a mix AR/VR, when the AR user manipulated an artefact, the VR users could see the artefact being moved within the VR environment. Our work is closely related to Yue's, but we focus on the different platform(HMD and Non-HMD) in one space to interactive, increasing the engagement and enjoyment for social influence[4]. We tries to enable an equally enjoyable experience for the Non-HMD user.

- [1] J. McVeigh-Schultz, A. Kolesnichenko, and K. Isbister, "Shaping Pro-Social Interaction in VR," pp. 1–12, 2019, doi: 10.1145/3290605.3300794.
- [2] A. Katifori *et al.*, "Cultivating mobile-mediated social interaction in the museum: Towards group-based digital storytelling experiences," *MW2016 Museums Web 2016*, no. April, 2016, [Online]. Available: http://mw2016.museumsandtheweb.com/paper/cultivating-mobile-mediated-social-interaction-in-the-museum-towards-group-based-digital-storytelling-experiences/%0Ahttp://eprints.gla.ac.uk/143241/.
- [3] Y. Li, E. Ch' Ng, S. Cai, and S. See, "Multiuser Interaction with Hybrid VR and AR for Cultural Heritage Objects," *Proc. 2018 3rd Digit. Herit. Int. Congr. Digit. Herit. 2018 Held jointly with 2018 24th Int. Conf. Virtual Syst. Multimedia, VSMM 2018*, 2018, doi: 10.1109/DigitalHeritage.2018.8810126.
- [4] S. Lindley, J. Le Couteur, and N. Bianchi-Berthouze, "Stirring up experience through movement in game play: Effects on engagement and social behaviour," *Conf. Hum. Factors Comput. Syst. Proc.*, pp. 511–514, 2008, doi: 10.1145/1357054.1357136.