

Advancing the Interactive Context of Immersive Engineering Applications

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Abstract

The presentation gives an overview of the work carried out, in the context of the VISION project, on the development of advanced interaction metaphors for human-oriented life cycle procedures in critical aircraft-related virtual products. The interaction metaphors specification framework has been built upon a) generic usability guidelines, associated with typical interaction metaphor taxonomies for simplified tasks, and b) requirements to address specific needs of the VISION project end users for real-life operations. The development of the interaction metaphors is based on a platform independent architecture in order to give the opportunity to use the interaction simulation functionality in various Virtual Reality (VR) platforms, with minimum adaptation. The interaction techniques and metaphors help users grasp objects and manipulate them in a natural manner, while providing visual feedback for the position and desired precision. In addition, the interface technologies provide the required amount of immersive information to the user, while providing means for giving back information to the system (e.g. numerical values) in a user friendly way. An overview of the developments is provided, including the 3D Immersive Interface Template, the 3D Annotations, the Alphanumeric Input, the Adaptive Finger Grasping, the Magnet Function, the Object Position Control, and the Pool to Hand Instantiation Metaphor. Finally, the use of the developed metaphors in the context of two real-life industrial use cases, namely a) flight attendant's operations and cabin light design activities, and b) final assembly operations, including hole drilling and riveting processes, is also presented.