

Title: “Using Augmented Reality for Collaborative Concurrent Engineering”

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Abstract:

At German Aerospace Center (DLR) new spacecrafts are designed by engineers within a special room, called Concurrent Engineering Facility (CEF). Here, around 12 experts of various domains, such as orbit, power, and propulsion discuss a potential design, which usually takes one week. Therefore, communication and understanding of interdependencies, and arrangement of satellite components are crucial tasks to create a conflict-free and feasible design from early on.

To support concurrent engineering process in the early phase stage, we present a new approach in Augmented Reality (AR) and examine the acceptance of interactive collaboration for a spacecraft design scenario. To enable real-time cooperation in a shared setting, we connected various AR head mounted displays like HoloLens 2 via a network. Furthermore, we implemented an AR application that retrieves visualization data from Virtual Satellite 4, an open source data model, and enables manipulation of individual spacecraft parts through hand gestures. We conducted a perceptual study with 11 participants a 2-3 persons in 4 groups to evaluate our case study. We measured the usability of the application, the potential benefits and the ability to resolve interdisciplinary conflicts between requirements, such as difficulties in mutual understanding.

