Case Studies Using Immersive Virtual Assembly in Industry

ABSTRACT: The Virtual Assembly Technology Consortium is a university/government/industry consortium that seeks to investigate the application of virtual assembly methods in mechanical system assembly processes. In this paper we report three categories of engineering case studies that have been developed by the consortium members over the past two years, describe the overall methodology, and then proceed to feature specific details of two key case studies. An engineering case study has been defined as an account of an engineering activity, event or problem containing some of the background and complexities actually encountered by an engineer, with the objective of providing a medium for learning. The objective of the case studies was to assist consortium members in demonstrating and validating the use of immersive virtual assembly technologies and tools in the simulation of factory floor manufacturing processes. What is of special significance is that instead of modeling simplified problems or perceived representative situations, the case studies were constructed from actual assembly floor projects and situations encountered at industry member sites and with considerable participation from industry engineers and manufacturing shop floor personnel. Based on the success of the case studies, the consortium members inferred that virtual assembly methods are poised to move out of the realm of special projects and test scenarios to deployment in the actual design and manufacturing cycle. However, in order to be truly accepted in industry, there are still issues to be addressed in terms of ease of use, portability of the applications, and preparation of the models for the evaluations. Thus, the case studies added a new dimension to the exploration and understanding of how this new technology could be of practical value in industry.