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Virtual Worlds for Serious Applications (VS-GAMES'12)

## Workshop on the use of serious games in the education of engineers

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### Abstract

Serious games have proved to be an important tool in supporting the education and training at schools and universities as well as for vocational training in industry. Most games designed for educational or vocational use are designed for a very narrow purpose, mostly for mediating a small range of skills to a specific target group. This paper outlines the workshop on the use of serious games in the education of engineers. It presents the topic and raises some questions that will be discussed during the workshop.

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*keywords:* Serious Games; Engineering; Manufacturing.

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### 1. Overview

The ability to maintain and develop the competitiveness of European manufacturing industry is essential for the prosperity of the EU. Significant improvements in the competitiveness of enterprises have been recognised to only emerge as a result of improved ICT structures, combined with a shift from goods-based to knowledge-based products. However, manufacturing organizations are confronted with a two-fold challenge consisting not only in business complexities but also behavioral ones. The former is the result of economic trends marked by globalization and fast-paced technological advancements while the latter is the consequence of the bounded rationality and misperceptions of the economic actors. This hinders the performance of decision makers in dynamic systems and calls for continuous learning, which constitutes the true competitive advantage for organizations. The European manufacturing industry has dealt with these challenges for years, resulting in a trend towards collaborative production of highly complex products. This trend places new requirements on the

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education of future engineers regarding their collaboration competencies as well as the demand for training possibilities supporting the vision of lifelong learning. However, current manufacturing education is often based on a traditional curricula and teaching concept and cannot entirely answer to the various needs and requirements of the system. On the other hand, several educational institutions are heading for a change towards the use of teaching methods involving experiential learning. The use of serious games are suitable for mediating intangible knowledge through experience, and this will allow the student to experience in a safe but realistic environment.

In this half day workshop on the use of serious games for engineering education, the first session will start with an introduction to the topic, presenting the pedagogical requirements of the education of engineers followed by a presentation of different games used for educational purposes at the Universities of Nottingham and Bremen, as well as at the Politecnico di Milano. A main barrier for higher penetration rates of serious games in engineering education is the difficulty to deliver evidence of more effective learning than traditional teaching methods. Thus, after the introduction to the games, Igor Mayer will present approaches for learning assessment based on his experience. The second part of the workshop will be a hands-on session in which the participants can try out the games. The workshop will close with a discussion session on advantages and limitations of using games in engineering education.