

# EDITORIAL: SPECIAL ISSUE ON USE OF VIRTUAL WORLD TECHNOLOGY IN ARCHITECTURE, ENGINEERING AND CONSTRUCTION

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## 1. INTRODUCTION

The rapid development of World Wide Web and the dominance of networked computers for information transfer and communication have enabled the rise of online computer games and recently the virtual worlds. Virtual worlds, which are similar to the computer games with which they share technology, take their participants called residents to new places beyond the physical and geographic limitations of the real world. Residents become producers of content in the virtual world, designing and developing the environment around their own interests. This virtual world technology can offer significant benefits for AEC disciplines from 3D walkthroughs, interactive visualisation, through virtual collaboration, design and planning to education, and training. The special issue is aimed to provide insights into the use of virtual world technology in AEC and includes seven papers with authors representing institutions in Australia, Canada, Finland, New Zealand, UK, and the USA.

## 2. PAPERS IN THE SPECIAL ISSUE

The papers in the special issue focus on the use of virtual world technology in AEC. The first paper by Merrick *et al.* examines the innovative use of emerging multiuser virtual world technologies for supporting human-human collaboration and human-computer co-creativity in design. They explore the virtual world platforms in terms of design tools, communication and artificial agents and then discuss four case studies involving collaborative design using virtual worlds. Ku and Mahabaleshwarkar propose the concept of Building interactive Modeling (BiM) which complements the capabilities of BIM with social interaction to enhance collaboration and learning in AEC. They developed role-playing scenarios in Second Life to demonstrate specific opportunities of BiM which engages dispersed and traditional classroom students to interactively study the construction process of buildings.

Iorio *et al.* discuss the design collaboration in a virtual collaborative space developed in Second Life, called CyberGRID (Cyber-enabled Global Research Infrastructure for Design) that supports design work in global virtual networks. They discuss the tools developed to facilitate the collaboration and interaction in seven global virtual networks of designers in a virtual space. Their paper also examines the factors that impact the usage patterns and adoption of these collaborative tools. McMeel and Cockeram's paper discusses the design theorist Bryan Lawson's design problem/solution mapping of analysis, appraisal and synthesis as a framework to scrutinize design and construction in a virtual world. Authors bring evidence to suggest that the value in using Virtual Environments is in their potential to facilitate collaboration, and not just in the popularised phenomenon of 3D or 4D model creation.

Arain and Burkle's paper discusses the potential of Second Life in enhancing learning and training of construction project management. The paper also discusses the project visualisation, project teamwork, resource management and project optimization with examples in Second Life. Authors also draw attention to the benefits and challenges of the application of Second Life for learning construction project management. Behzadan and Kamat's paper focuses on the methodology and the technical details of constructing and updating augmented scenes of engineering operations using scene graphs. Their research developed a system that can create 3D AR animations of arbitrary length and complexity at the operations level of detail. Finally, the paper by Raju *et al.* discuss the potential of Second Life in construction with an example application of whole life cycle costing in Second Life. They examine the communication mechanisms in Second Life and demonstrate the integration of external databases within the Second Life.

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