EXPERIENCE-BASED DESIGN REVIEW OF HEALTHCARE FACILITIES USING AN INTERACTIVE VIRTUAL PROTOTYPING SYSTEM

GOALS AND OBJECTIVES

1. Investigate a virtual prototyping procedure for capturing and representing end user experience and tacit knowledge of activities that are undertaken in a healthcare facility.
2. Design a framework for structuring end user activities into scenarios that can be simulated in an interactive virtual prototyping system.
3. Develop an interactive computing platform titled the Experience-Based Virtual Prototyping Simulator (EVPS) for healthcare facility design reviews.
4. Assess the developed EVPS application to evaluate the effectiveness of interactive virtual prototyping systems in enhancing the experience-based design review process of healthcare facilities.

PROBLEM STATEMENT

VARIOUS STAKEHOLDERS in specialized facilities such as Healthcare leads to fragmentation, lack of communication of design intent and rationale and increase in design cost and time. VIRTUAL PROTOTYPES provide opportunities for a team of project stakeholders to experience design alternatives and provide domain-specific knowledge early in the design and decision-making process.

EXPERIENCE BASED DESIGN

“Experience-based design is a user-focused design process with the goal of making user experience accessible to the designers, to allow them to conceive of designing experiences rather than designing services” [Male and Robert 2006]

FRAMEWORK FOR INTERACTIVE DESIGN REVIEW

CURRENT STATUS AND THE NEXT STEPS

- Investigation of design information workflows to transfer a healthcare facility model into the Unity game engine and identification of existing challenges.
- Information architecture of the interactive virtual prototyping system and skeletal design of hierarchical data structure for task-based scenarios.
- Generation of reusable interactive model content, which will include avatars of end user roles and interactive objects.
- Initial testing of the under-development EVPS application and task-based scenarios for validation of the procedure and features developed.
- Implementation of the EVPS application in a design review session within an immersive virtual environment with multiple project stakeholders.
- Formulation of guidelines and revision of framework to implement experience-based virtual prototyping system in a healthcare context based on the analysis and results of the implementation experiments.

Sonali Kumar1, John I. Messner2, Christopher Wiacek3, Matthew Hedrick3
1 Graduate Research Assistant, Department of Architectural Engineering, Penn State University (email: sonali@psu.edu)
2 Associate Professor, Department of Architectural Engineering, Penn State University (email: jmessner@engr.psu.edu)
3 Graduate Student, Department of Architectural Engineering, Penn State University (email: cjw5027@psu.edu, msh5020@psu.edu)