Multiplayer Game Frameworks for Crowd-Aware Co-design of Environments

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4/14/2017 at 11:00 am
Core 301A

Abstract

This thesis proposes two different frameworks in the field of Games in Research. Contribution 1 Architectural design decisions stand to benefit by accounting for the presence and activities of human crowds that inhabit these spaces. Computational methods for simulating synthetic crowds provide a cost effective means of exploring and analyzing the design search space. However, crowd-aware architectural design is a complex combinatorial decision process, where small changes in the design solution may affect crowds and their flow patterns in unexpected and potentially unintuitive ways. Existing solutions rely on expert intuition or automation, but are unable to account for many contradicting, and often subjective properties while optimizing designs. A single solution approach may also miss potential design solutions that achieve the desired objective specifications, while meeting subjective criteria. We propose a means of combining these methods in a gamified framework. Using our system, “players” (novice users or experts) can rapidly iterate on their designs while soliciting feedback from computer simulations of crowd movement, as well as the designs of previous players. Our approach affords a new way of thinking of the solution space in that it inherently supports competitive co-design and crowd sourced solutions. We evaluate our framework through a user study and demonstrate the potential of crowd-aware co-design of environments using simulation guided multiplayer games. Contribution 2 Games in research is a modern trend in the world of research. Games are being used to simulate, monitor and test occurrences in the real world. However, Game development knowledge is the initial requirement to use games in research either in any non-technical or technical field. Besides, availability of existing games suited to research is very meager. Also, attracting and reaching out to enough users for proper user study is a difficult task. We propose a connected real-time website and desktop-based game application. The website is themed as a social network which will help connect researchers
with gamers and keep them updated. Our application also allows a researcher
to choose and modify a few configuration parameters to change the game ac-
cording to his requirement as well as dedicated ownership to the collected
data. The game application provides a robust Massive Multiple Online game
environment for a smooth and exciting gaming experience to involve gamers
to contribute to research.

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