Using Semantic UI Descriptions for Adaptive Mobile Games

Pascal Bihler, Holger M"ugge, Mark Schmatz and Armin B. Cremers
Computer Science III, University of Bonn, 53012 Bonn, Germany
{bihler, muegge, schmatz, abc}@cs.uni-bonn.de

Classical “computer game reality” is completely virtual, but location based games are different: They interweave physical reality with a virtual world. We learned that this leads to three UI adaptation challenges: (1) Run-time) Adaptation to different handset capabilities; (2) Adaptation to sensor-triggered dynamic context changes; (3) Game-Adaptation to the players’ experiences. We propose to cope with these using semantically described UIs (cf. [BM07]) where the developer focuses on what should be displayed, not how.

Until now, most prototypes for semantic driven UI rendering focus on form based applications. We propose to extend this technique to support interfaces for location based games. In the game Scotland Yard to go!, a main screen contains the following semantic interaction elements: (1) A group of different location based outputs; (2) A group containing individual action-elements; (3) An (invisible) input for GPS data. Based on this description, the game UI can be adapted to different handsets with specific UI requirements. Some of the dynamic context changes triggered by sensors just require a UI adaptation, which can be handled (since the semantic of the UI does not change) solely by a UI framework. Examples are: (1) Control resizing based on user motion; (2) Color scheme selection based on ambient light; (3) Adaptation of map orientation based on compass data. Location based games mainly consist of recurrent blocks like localization, visualization of position, active zones etc. Providing the possibility to recombine and reconfigure these building blocks would lead to a game construction kit. Each building block of this kit would have certain input and and output requirements, and only when merged reasonably together, they form a coherent game UI. For this, it seems to be ideal to use UI fusion we proposed in [BM07] and semantic interface descriptions can be part of the kit’s API.

Model based UIs and semantical UI composition has been under research [LMMG09, LHR+07], but these works mainly focused on form based interfaces. Location based gaming frameworks (as [SHG+07]) do not support semantic driven UI generation, yet.


