



Luis Paulo Santos Valente

**A methodology for conceptual design of
pervasive mobile games**

Tese de Doutorado

Thesis presented to the Postgraduate Program in Informatics of the Departamento de Informática, PUC–Rio as partial fulfillment of the requirements for the degree of Doutor em Informática.

Advisor: Prof. Bruno Feijó

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Luis Valente graduated in Computer Science at UFF (Universidade Federal Fluminense) in 2002 and received his Master degree from UFF in 2005. He joined the Doctorate program at PUC-Rio in 2007, researching on mobile entertainment with mobile phones. He is also a Nokia Developer Champion since 2007.

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To my family, and to the dreamers:
“believe you can fly”

Acknowledgments

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– “*Ri melhor quem ri de si mesmo, senão, ri melhor quem rivotril*”.

Resumo

Valente, Luis; Feijó, Bruno. **Uma metodologia para projeto conceitual de jogos pervasivos móveis**. Rio de Janeiro, 2011. 242p. Tese de Doutorado – Departamento de Informática, Pontifícia Universidade Católica do Rio de Janeiro.

A “pervasividade” em jogos pode ser reconhecida cada vez que as fronteiras do jogo se expandem do mundo virtual para o mundo real. Sensores, aparelhos móveis, redes de computadores e a internet tornam possível a existência dos jogos pervasivos. Neste trabalho, consideramos como “jogos pervasivos móveis” os jogos que usam ciência de contexto e aparelhos móveis. Consideramos também que os “smartphones” são o veículo ideal para a viabilização dos jogos pervasivos. Até onde sabemos, este é o primeiro trabalho sobre projeto geral de jogos pervasivos móveis. Esta tese propõe uma metodologia para apoiar a etapa de projeto conceitual de jogos pervasivos móveis. As contribuições principais deste trabalho são duas: [1] uma lista de características peculiares e importantes de jogos pervasivos, identificadas na literatura do assunto e em projetos de jogos pervasivos existentes. Cada característica possui também um conjunto de perguntas de verificação. Essa lista de características (e as perguntas de verificação) podem ser usadas para inspirar novas ideias de jogos e também para ajudar a descobrir requisitos funcionais e não-funcionais para jogos pervasivos móveis. [2] Uma linguagem específica de domínio para ajudar a especificar atividades em jogos pervasivos móveis que usem aparelhos móveis, sensores e atuadores como elementos principais de interface. Com essa metodologia, os projetistas podem discutir, identificar, verificar e aplicar características importantes de jogos pervasivos móveis. Também, por se tratar de uma metodologia de natureza “leve”, os projetistas podem trabalhar no “nível geral” dos jogos (projeto), ao manterem-se focados na especificação das atividades e evitando se preocupar com detalhes de implementação e código-fonte.

Palavras-chave

jogos pervasivos móveis; smartphones; linguagens específicas de domínio

Abstract

Valente, Luis; Feijó, Bruno (Advisor). **A methodology for conceptual design of pervasive mobile games.** Rio de Janeiro, 2011. 242p. DSc. Thesis – Departamento de Informática, Pontificia Universidade Católica do Rio de Janeiro.

Pervasiveness can be recognized in game playing every time the boundaries of playing expand from the virtual (or fictional) world to the real world. Sensor technologies, mobile devices, networking capabilities, and the internet make pervasive games possible. In the present work, we consider “pervasive mobile games” as context-aware games that necessarily use mobile devices. Also we consider that smartphones are the main driver to fulfill the promises of pervasive game playing. As far as we are aware, this is the first general work on pervasive mobile game design. This thesis proposes a methodology to support the conceptual design stage of pervasive mobile games. The main contributions of this research work are twofold: [1] A novel list of prominent features of pervasive games, identified from game projects and the literature, and checklists for each feature. This feature list (and corresponding checklists) can be used to spark novel game ideas, and to help in discovering functional and non-functional requirements for pervasive mobile games. [2] A domain specific language to help in specifying activities in pervasive mobile games that use mobile devices, sensors, and actuators as the main interface elements. With the proposed methodology, designers can discuss, identify, verify, and apply important features of pervasive mobile games. Also, due to the “lightweight” nature of the methodology, designers can easily catch the “big picture” of the games by keeping focused on the intents of the game activities, and not getting lost in the source code.

Keywords

pervasive mobile games; smartphones; domain specific languages

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