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# Abstract

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This thesis investigates the design, development, and evaluation of *CacheVenture - Guardians of the Memory*, a prototype serious game aimed at supporting the teaching of cache memory concepts in higher computer architecture education. While serious games are recognized for their potential to enhance motivation and engagement, their application in computer architecture remains limited and insufficiently studied. Developed with the Godot Engine, CacheVenture models fundamental cache topics including associativity, block number, block size, and replacement strategies using interactive and visual gameplay mechanics. The game supports Windows, Linux, and Web platforms to maximize accessibility. It was evaluated in a formative survey involving undergraduate students enrolled in a computer architecture course. Results showed that while the game was well-received for its motivational and visual appeal, its effectiveness in promoting deeper conceptual understanding was limited in this early stage. However, many concrete ideas were identified from the feedback for future work on improving the game. These insights contribute to the broader field of serious games research in computer architecture education, highlighting both the promise of game-based learning tools and the challenges involved in balancing engagement with pedagogical effectiveness.