

# **Infinity – Procedural Content Generation for Computer Games: A Capstone Project**

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## **Abstract**

Procedural Content Generation (PCG) for computer games and similar media consists of the automated, algorithmic generation of game content (ranging from visual content to narrative content) that was traditionally the product of manual design. Game aspects that are being generated procedurally include graphics, level design, and plot. PCG addresses issues affecting both the players and the developers of computer games. The former group can be affected by lack of replay value and adaptation to player skill level, the latter by development effort spent on repetitive, low-level design tasks instead of high-level, more rewarding, creative tasks.

The ability to generate game content automatically decreases the burden on human developers (who are, instead, provided with high-level creative opportunities which are likely less tedious and more rewarding), creates potential for more engaging game experiences for players, and facilitates insight into the creative processes themselves, helping us investigate the degree to which such processes can be successfully automated.

The two main components of this Capstone project are research and software development. The objective of the research component is to produce a literature survey on various types of procedural content generation for computer games. The software-development objective is to design and implement a 2D side-scrolling computer game the core mechanic of which is supported through procedural content generation. The player will control an avatar through keyboard-based input in order to navigate terrain containing procedurally-generated content (obstacles). This content will be generated in an adaptive, individualized manner (based on the player's performance) and assessed for solvability and difficulty.