

# Essay Proposal

## COMP110 - Computer Architecture Essay

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### Topic

My essay will be on procedural level generation for a 2D platform game.

### Paper 1

Link: <http://sokath.com/main/files/1/smith-launchpad-tciaig.pdf>

Smith et al [citation] propose a method for procedural content generation, for 2D platformer level design. Their objective is for creating an autonomous, designer-guided level generator with the use of a two tiered, grammar-based approach. The generator that is explored and explained is Launchpad, a rhythm based level generator. Their goal is to create an impressive variety of levels which are guaranteed to be playable. A problem with some PCG games is that, while impressive in their generation, they are not functional as a level due to improper placement of objects, i.e. the exit is placed out of reach of the player.

One way that Launchpad creates a playable game is through the use of bridging two rhythm sets with a safe platform for the player to use. By giving the player a safe platform between generated areas, it creates a point of stabilisation to allow the player to realign their movements to the next stage.

In order to create an guaranteed playable level, they have clear and intuitive results based on designer refined generative space through manipulating parameters such as frequency of geometry components; collectible distribution throughout level, and dictating general path. Therefore, giving designers a responsive translation of their input by creating a level that matches their requirements.

Launchpad is designed for dexterity based challenges that would often rely on rhythm and timing. The implied model of an ideal player for a platformer is speedrun behaviour which suggests that the player should strive to move at maximum speed, and aiming to complete the level in the quickest time and shortest path. This model also influences player direction through the placement of coins, rewarding and reinforcing player movement towards a certain direction. For example, leading a line of coins in a vertical drop would suggest to the player to follow this direction. Another way in which coins have been used

to enhance level design is to be used as decoration to fill long platforms and continue player engagement.

Other simplifications to Launchpads PCG approach is through creating enemies that can be killed (i.e. mobs) or avoided (i.e. spikes), gaps in platforms, sloped or flat platforms, along with moving horizontal or vertical paths.

Launchpad is based around the player input of rhythm, which includes: type, length and density. The two main player actions recorded are movement and jump, with recognition of when the player lets go of the button. The difference of hold time affects the height of the avatars jump, which a short hold is a short jump and long hold results in a long jump. This means for creating a game with varied platform gaps should be affected by the length of jump hold time.

A limitation of the simplification of Launchpad is through its focus on generation built into single-cell levels. While games such as Sonic [citation] use multiple-cell levels and portals, Launchpad is currently only capable of creating a single path which the player must follow.