ECS 289G
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Final Project Proposal

GDMC Procedural Generation

Group Members

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Overview

For the final project, we will be working with the framework provided by the GDMC competition, to procedurally generate rich and adaptive Minecraft settlements that both are aesthetically pleasing and maintain a coherent history. The goal is to be able to produce settlements of comparable quality to those produced by human builders while showcasing the areas of our personal research in procedural generation, natural languages processing, and visual analytics. Most of our guidelines will be set by the official GDMC rules and instructions with an emphasis on integrating the “chronicle” challenge into the actual creation of the settlement. At the moment, our settlement theme appears to be based on the designs of Japanese gardens, however this is subject to change.

See: http://gendesignmc.engineering.nyu.edu/

User Experience Enabled By Your Design

The main experience generated by our design will be fruitful exploration. One of the primary highlights of any minecraft adventurer is stumbling upon massive caves, small villages, sand temples or other unusual structures while exploring the familiar biomes in search of resources. Our design will create much more intricate and interesting destinations than ones found in traditional minecraft. We hope to create a space that can capture the player’s imagination with environmental storytelling in a way that encourages them to find the intentionality behind the settlement’s creation. This may be things like the evidence of the builders, traces of original purpose, building design choices and the history of the settlement's creation. Exploration with a definitive finding is always more satisfying than obviously random structures and we hope that our project will create this for all the blocky adventurers.

Design and Technical Approach

This project will be built using:

- The GDCM Framework - https://github.com/mcgreentn/GDMC/wiki/The-GDMC-Framework
- MCEdit - https://github.com/mcgreentn/GDMC/wiki/Creating-a-Filter-for-MCEdit
- MCAI Framework
- Python Anaconda - https://www.anaconda.com/
- GPT2
- Talk of the Town
- Minecraft - The Game, Version1.12

Our code will consist of a backend containing our generation function, a module for aesthetic rules and buildings, a module for story generation/textual output (GPT and TotT), and the MCFilter, which will be given to MCEdit to be generated in the world. Time permitting, we hope to package our work into a viable mod for the Minecraft game.

Novelty

For this project we want to build on top of "Generative Design in Minecraft (GDMC) (http://game.engineering.nyu.edu/wp-content/uploads/2019/01/GDMC.pdf) . The paper describes the basics of the GDMC competition and describes common challenges to consider when designing a generative system for minecraft. We want to focus on sections 2.5.3 and 2.5.4, which highlight the importance of believability and consistent narrative as well as visual aesthetics. Taking into account these issues we see the novelty of our project in the specific area we want to apply them. As mentioned in the introduction we wanted to focus on (japanese) garden design. Contrary to settlement design, garden design adds unique requirements in the aforementioned categories. We will therefore expand the scope of GDMC towards landscaping and incorporation of those spaces into the settlement creation idea.

Value

The value of our project will be apparent to any minecraft player after stumbling across a slightly different variation of villages more than twice. But more seriously, anyone working in environmental design in game development should be interested in the results of our project, as we are taking a novel approach in trying to tie structure generation to a generative history. This would be a fantastic direction to explore for fleshing out open world games with areas that have relevance and intentionality without having to hand author every single farming village. We imagine that those who are in the field of procedural generation may also find our work intriguing given the more qualitative/tangible results we are hoping to create. Instead of trying to generate something within a given metric, our goal is to produce something that makes "sense" and can "feel real" to a player.

Documentation and Access

Github - The code will be located/maintained and shared through github.

- https://github.com/lukasmaxim/Zencraft

Google Docs/Drive - We have a team drive to deposit helpful information, important files, outside resources and keep a collection of interesting results/pictures/outputs that will not be part of the final work.

- https://drive.google.com/drive/folders/1ECOrS5BWw6rDo91JYmmdYgTlAhGfWiny?usp=sharing

Discord - Discord is the primary method of communication between team members, serving as an informal hub for scheduling, coordination, troubleshooting and task assignment.

- https://discord.gg/DRwnrDTHSr

Google Sites - Once the project is underway, we hope to present a small website showcasing the best results with a brief readme, general description and explanation of the technical approach.

- https://sites.google.com/d/19Pip2wIuuRDc71cnW0t9zCZG3zXL_KNG/p/1-RuymYY7s3OjVmQe7g7Bf9il5FboRpDe/edit

Contributions of Team Members

Environment Setup:	David & Lukas
Visual Aesthetics/ Building Design:	David & Lukas
Main Generation Function:	Simba
Chronicle Challenge:	Siena
Story/History Genation:	Siena
Functionality and Terran Adaptation:	Simba
Deliverable Reports:	Siena
Website Presentation:	David & Lukas