

IM3002 Term Project A - Design Document

Nabeeha Ali, Amy Truong

February 13, 2022

Objectives

For this term project, we decided that our goal is to procedurally model an application in Maya that produces a complex vegetation pattern. The application will feature an L-system based model of vegetable vines and fencing, and stochastically generated vegetation on grassland. The group members of this project are Amy Truong and Nabeeha Ali. Since there are two members of this project, we have chosen two items from the provided list in order to double our scope. Amy will be responsible for creating the vegetation land featuring various types of plants and objects, while Nabeeha will be focusing on the development of the vegetable vines and fencing. Since project scopes are always changing, we have planned for ways to adjust our plans depending on if there is more or less time:

Scope Reduction:

- Decrease the number of items to feature on grassland
- Remove the option to choose the dimensions of the vegetation plane
- Decrease the number of vegetables to feature on L system vine
- Remove fencing L-system

Scope Expansion:

- Increase number of plant options
 - Add more plant types in the GUI
- Add subtle animations to objects such as flowers moving up and down
- Random cloud generator for scene
- Add parameters to change axiom for vegetable vine

High-Level Modules

This project will be divided into four main modules, one for the GUI, one for the grassland, one for the vegetable vine, and one for the fencing.

1. GUI window
2. Generate grassland (plane)
 - a. Generate tall grass
 - b. Generate daisies
 - c. Generate pumpkins
3. Generate vegetable vine
 - a. Generate pumpkins

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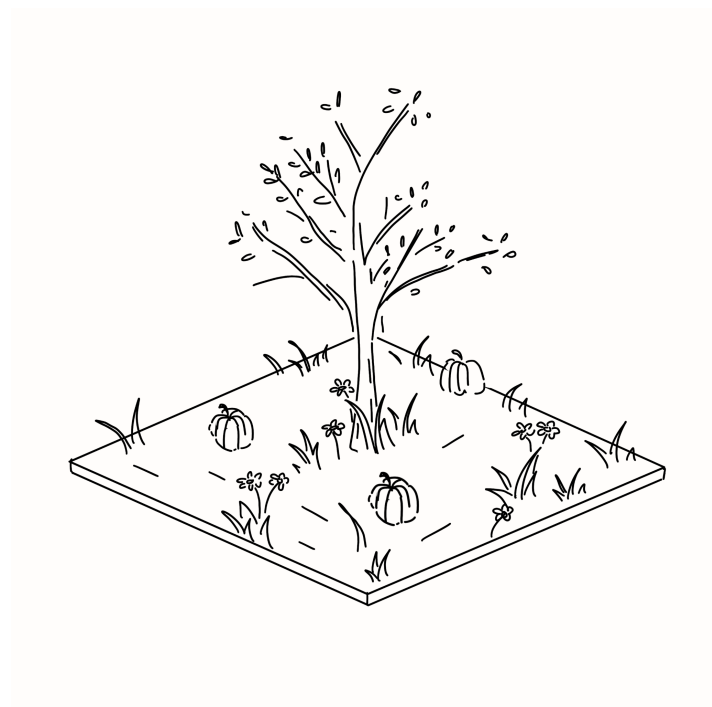
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- b. Generate corn
 - c. Develop rules for L-system (regular L-system)
4. Generate Fencing
 - a. Generate fence
 - b. Develop rules for L-system (turtle graphic)

Mockup

The GUI will have a combination of buttons to generate elements of the scene as well as options to modify the parameters of the grasslands.

- **Grasslands:** For the grasslands, the GUI will have a slider for the user to adjust the size of the land, checkboxes to indicate what plants they want to generate, and a button to generate the vegetation plane
- **Vegetable vines:** The GUI options for the vines will include one button that will be repeatedly clicked on to generate and grow the vegetable vine.
- **Fencing vines:** The GUI options for the vines will include one button that will be repeatedly clicked on to generate fencing around the grassland perimeter.
- A **button** to clear everything in the scene



We created a rough sketch to help visualize the layout of our final model. The tree will be placed in the middle by default and the user will have the option to select how they wish to decorate their garden. They can decorate by adding plants, creating a vegetable vine, and/or fence the surrounding area.

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Backlog

Task	Assignee
Create GUI window	Amy/Nabeeha
Add grassland parameters to GUI	Amy
Add vegetable vine and fencing generator buttons to GUI	Nabeeha
Poly model tree in the centre of the grassland	Amy/Nabeeha
Poly model tall grass patch	Amy
Poly model tree	Amy
Randomize position 3D models (done to one object, applied to all)	Amy
Define rules for vegetable vine L system	Nabeeha
Define axiom and variables for all L systems	Nabeeha
Poly model daisy	Amy
Poly model pumpkin	Nabeeha
Poly model sunflowers	Amy
Generate random daisies	Amy
Generate random sunflowers	Amy
Generate random tall grass patches	Amy
Poly model fence	Nabeeha
Define rules for fencing L-system	Nabeeha
Connect fencing L-system to plane dimensions (to fit around perimeter)	Nabeeha
Keep vegetable vines within the area of the given vegetation plane	Nabeeha