Scrum Report

Sprint 1

Sprint goal:

- Setting up a basic terrain with some buildings and foliage in Unreal Engine.

Product log:

- Install and set up needed tools
- Finalize the vision and scope of the project
- Analyze user requirements and the general workflow

Member task:

- Ibrahim Mahmoud
    - Create a terrain with a heightmap in Unreal Engine
- Wanying Lu
    - Research on buildings and streets modeling
- Zachary Morello
    - Procedural texturing and foliage

Scrum record:

- Accomplishments:
    - Research on Unreal Engine features
    - Conduct user stories by interviewing potential users
    - Gather needed geographic datasets
    - Writing assignments for this course
- Concerns:
    - Sometimes Unreal Engine crashes for unknown reasons
- Roadblocks:
    - None

Sprint Review:

- This sprint is mainly about analyzing user requirements and learning many different Unreal Engine features. We held several meetings to gather requirements from our project partner, Dr. Raffaele de Amicis and some potential users. We decided to visualize tsunami scenarios which take place at Seaside, Oregon. Each team member is assigned a specific task related to the visualization in UE. However, due to the long learning curve, we have not yet merged everyone's work.

Sprint 2

Sprint goal:

- Create a small version of the terrain to verify a scalable the workflow

Product log:

- Crop the heightmap to a smaller size (3*3 blocks)
- Create a small terrain
- Combine everyone's implementation to one project

Member task:

- Ibrahim Mahmoud
    - Create the small terrain in UE
- Wanying Lu
    - Import small portion of buildings and streets to UE project
- Zachary Morello
    - Crop and convert the height map in ArcGIS

Scrum record:

- Accomplishments:
    - Combined every team member implementation
- Concerns:
    - The street models generated by third-party software CityEngine is not aligned to the terrain after being imported into unreal engine
    - We only have access to a older version of CityEngine
- Roadblocks:
    - None

Sprint Review:

- This sprint we decided to implement our user requirements on a smaller terrain to verify a feasible workflow. We successfully created a small version of the Seaside landscape.

Sprint 3

Sprint goal:

- Add more features to the small landscape

Product log:

- Created a beach simulation
- Crowd AIs
- Street models

Member task:

- Ibrahim Mahmoud
    - Research on UE 4.26's new water system
    - Learned how to simulate a beach
- Wanying Lu
    - Visualize street with UE4 spline tool
- Zachary Morello
    - Research on UE4 AI Crowd system

Scrum record:

- Accomplishments:
    - Water material added to the landscape
    - Simple streets generated by the spline tool
    - Few crowd AI added to the landscape
- Concerns:
    - The water feature is not well documented because it's a new added feature in UE4
    - We don't know how to incorporate spline tool with street network data
    - The Crowd AI is not well documented either.
- Roadblocks:
    - There are many new technologies we need learn in UE4

Sprint Review:

- In this sprint, our group members learned a lot of new UE4 technologies and knowledge. Each group member has been working on the features assigned to them. The only problem is that it is hard to find good learning resources, because some features of UE4.26 just came out this month.

Sprint 4

Sprint goal:

- Continue working on features added in last print

Product log:

- UE 4.26's Water plugin
- CityEngine plugin Vitruvio

Member task:

- Ibrahim Mahmoud
    - Further research in UE 4.26's Water plugin and attempt various methods of implementations
- Wanying Lu
    - Research on alternative ways to generate street models
- Zachary Morello
    - Continue research on UE4 AI Crowd system

Scrum record:

- Accomplishments:
    - Figured out how to implement a tsunami using UE 4.26's Water plugin.
    - We are able to generate buildings directly from the geographic data in UE4 by using the Vitruvio plugin
- Concerns:
    - The water plugin has a lot of bugs to it
    - The Vitruvio plugin is a beta version which does not support street generation.
- Roadblocks:
    - Many failed attempts at using UE 4.26's Water plugin to simulate Seaside's bodies of water.

Sprint Review:

This sprint is more about the research and testing of Unreal Engine features to see if they can fulfill our project requirements. Many UE4 features are still in the beta version. We made many failed attempts in the process of approaching the solution.

Sprint 5

Sprint goal:

- Figure out alternative means of simulating a tsunami in UE.

Product log:

- Gerstner Wave material
- The deep-ocean-wave material

Member task:

- Ibrahim Mahmoud
    - Create the tsunami using procedural Gerstner waves.
    - Research the ArcGIS SDK for UE.
- Wanying Lu
    - Research on a data integration software called (FME)
- Zachary Morello
    - Implement the Crowd AIs in the small landscape

Scrum record:

- Accomplishments:
    - Created a Gerstner Wave material
    - Created a deep-ocean-wave material
    - Extract the street network data as csv format by FME
- Concerns:
    - We are having problem to import the street data as spline in UE
- Roadblocks:
    - The spline tool in UE has some restrictions on the number of splines.

Sprint Review:

We successfully added Crowd AIs and more water materials to the small landscape. We also researched more UE4 plugins that might be helpful for our project. We are confident to realize features of the small landscape on a larger terrain.

Sprint 6

Sprint goal:

- Use the data provided for us to create a tsunami animation in UE.
- Identify scalable processes for visualizing heightmap data into UE.
- Estimate the final performance by testing a small-scale version of the simulation

Product log:

- Created a tsunami animation
- Created the full heightmap
- Created a small-scale simulation

Member task:

- Ibrahim Mahmoud
    - Create a tsunami animation using the tsunami data provided for us.
    - Find a scalable resource for obtaining height maps and satellite imagery.
- Wanying Lu
    - Project description for Expo
    - Writing assignments
- Zachary Morello
    - Find a better heightmap and convert it to the right format in ArcGIS

Scrum record:

- Accomplishments:
    - Created a working tsunami animation in UE using the tsunami data provided for us.
    - Found a scalable resource for obtaining height maps and satellite imagery in nationalmap.gov.
- Concerns:
    - Due to the damage of the computer equipment, the process of our project may be affected.
- Roadblocks:
    - Wanying's computer has completely crashed and she needs to find a solution to keep working on the project.

Sprint Review:

We had made some progress in tsunami animation. One of our team members' computer was damaged accidentally. Fortunately, we solved the problem very quickly by finding alternative equipment.

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Sprint 7

Sprint goal:

- Begin assembling the final project

Product log:

- Created tsunami blueprint
- Created map material for terrain

Member task:

- Ibrahim Mahmoud
    - Convert the tsunami material to a blueprint
- Wanying Lu
    - Expo Group Webpage Draft
    - Prepare material for group presentation
    - Added building models to the landscape
- Zachary Morello
    - Added the Crowd AIs to the landscape

Scrum record:

- Accomplishments:
    - Converted the tsunami material to a blueprint
    - Helped fix heightmap scaling issues.
    - Be able to adjust tsunami parameters in real-time.
- Concerns:
    - There are a large number of building models that need to be imported into Unreal Engine 4. However, our computers froze many times when we were working on the scene.
- Roadblocks:
    - Some technical issues related to the equipment.
    - Github

Sprint Review:

We made a lot more progress this sprint. We assembled the final version of the project, which is the entire Seaside landscape. Each team member added their own responsible feature to the final product.

Sprint 8

Sprint goal:

- Complete all project documentation and set up for Expo

Product log:

- Project Archive
- Expo page
- Response to peer review

Member task:

- Ibrahim Mahmoud
    - Fine-tuned tsunami blueprint and incorporated more parameters.
    - Compile the project for an Oculus Quest 2.
- Wanying Lu
    - Prepare materials for Expo
- Zachary Morello
    - Demo video
    - Texturing

Scrum record:

- Accomplishments:
    - Compiled the project for an Oculus Quest 2.
- Concerns:
    - Not enough time to polish the scene.
- Roadblocks:
    - The computer freezes for too long when running the software.

Sprint Review:

This is the last sprint of this project. Everyone in our group has made an outstanding contribution to this project. We have completed the most basic project goals in our scope. Due to the lack of time, our final landscape still needs some polish by adding more objects and features into the scene.