Metal Renegades: Refining Gameplay

A GSOC Proposal by AndyTechGuy

The Project

Project Description

Last year, I participated in Google Summer of Code under Terasology. My project last year focused on the initial technical implementation of Metal Renegades; a game first proposed in this forum post. Along with the work of wabadump (another GSOC student), an initial operational version of this proposed game has been brought to life. As well, many advanced features, such as dynamic cities, dynamic characters, and more, have been implemented. These features form a strong technical backbone for this module.

This year, my proposal focuses on refining this implementation from a different perspective. Right now, the entire Metal Renegades module presents itself more as a “technical demo” rather than a compelling game experience. I believe that it is now beneficial to shift my focus away from more technical feature development, and rather focus on creating a compelling experience for a player to enjoy.

Deliverables

I plan to make the “Metal Renegades” experience more interesting to players in three different ways:

1. **Creating compelling player goals:** While many cities, quests, and natural landmarks currently exist in the world, there is currently no motive to interact with any of these elements (ex. Players currently have no motive to gather money) or if a motive exists, it is incredibly rudimentary (ex. Players have thirst, but water cups are infinitely reproducible, therefore no reason to stay in cities). These problems can be addressed through these proposed changes:

    a. **New Dangers outside Cities:** Right now, there is no real motivation to stay inside a city (outside of food & thirst). This can be addressed by adding a nighttime danger to outer-city travel. At night, enemies spawn around the player, and attack! (MawGooey enemies, and skeletons from GooeysQuests) These enemies can only be avoided by staying inside cities.

b. **Addition of valuable items:** Adding valuable items such as minerals (iron, silver, diamond), jewelry (necklaces, crowns, etc.) which can be bought, sold, used in quests, and be discovered, (see #2a) presents a greater motive to gather money. The collection of minerals can tie in well with the ore generation which already exists in Metal Renegades. Caves will be added to make the discovery of ores easier.

c. **Modifying thirst mechanics:** Currently, thirst mechanics are incredibly easy to manipulate, with infinite water cup generation from wells, and the slow decrease of the player's water supply. This can be balanced by increasing the rate of thirst, reducing the number of wells in cities, and limiting wells, done by "drying up" the well if it is used too much.

d. Modifying hunger mechanics: Unlike thirst, hunger is very hard and tedious to manage, with currently only one source of food (deer). This can be balanced by adding a greater selection of food sources. These food sources will come from the addition of farm locations in cities (with *Terasology/SimpleFarming*) and the addition of luxury foods in marketplaces (food assets from here or another free location).

2. **Embedding Personality into the World:** Many of the technical elements so far have given the game a very robotic feel. While the game should be robotic (it is about robots after all!) it should have a unique personality and feeling. This personality can be embedded into the game through these changes:

a. Addition of new discoverables: Outside of the city, hidden buildings, treasures, etc. can be found. These can be located either by the player's own exploration, or by buying a *Prospector's GPS* from the market. These items will bring the player to the location of one, and only one of these treasures. These quests will be risky adventures, since the wilderness becomes very dangerous at night!

i. Predetermination of Treasure Location: Treasures will be placed into the world via the use of a Facet/Rasterizer pair in the world generator. To be able to track these treasures from a distance, the treasure location must be predetermined before the chunk itself is loaded. This can be done by exposing the noise generator responsible for treasure placement, therefore providing a '*getNoiseValue()*' function in the treasure facet.

b. Personalities of NPC Characters: The cities contain many citizens, but each citizen is currently rather faceless, without personalities or identifying characteristics. Each character will be given a name, which displays over their head much like how a city name is currently displayed. As well, various spawn

characteristics will vary between characters, such as movement speed, rate of need reduction, physical size, etc.

c. **Modification of Dynamic Cities:** The dynamic cities implemented last year have a few characteristics which should be changed to fit the game more cleanly. The growth rate of the city should be slowed down significantly, to the extent that the generation of individual buildings should be notable. As well, cities should not generate in the spot where the player spawns. The beginning of the game is much more powerful if the player starts in a total wasteland, where they must seek out civilization for safety. As well, in the cities themselves, the ratios of each building is currently irregular. Wells fill up the city, while churches are much rarer. These ratios must also be modified to be more regular.

d. **Increase of Gameplay Difficulty:** Right now, many game-breaking easy elements are integrated into the game. There are two major elements that need to be fixed:

    i. **Prevent Spawning with Tools:** By default, the player spawn with all the necessary tools in their inventory. These will be removed from the inventory, and added instead as purchasable items in markets. A console command will be added to maintain these tools for developers.

    ii. **Increase Block Break Time:** Right now, many blocks such as stone, sand, and wood can be easily broken, without using the proper tools. This will be changed by changing the “hardness” of these materials in the world generator.

3. **Fixing Immersion-Breaking Issues:** There are two major issues remaining from last year’s projects which may take away from the positive experience for the player. These issues are:

    a. **Performance Issues:** The biggest problems with the module at this point are lag and inconsistent slowdowns which make gameplay very uncomfortable, and play on lower-powered machines almost impossible. The biggest offenders here come from the DynamicCities modules and Behaviors modules. R&D must be done here to find performance optimizations and implement them.

    b. **Character Pathfinding:** A major problem exists with the city citizens; to travel to any location they all take a direct path. This results in a lot of characters getting stuck before they reach their destination. This must be fixed with the addition of formal pathfinding, or use a temporary solution (such as changing building design so characters cannot get stuck, or teleporting them when they get stuck) until proper pathfinding can be implemented.

Timeline

Dates/GSOC events	Goals
Community Bonding Period May 4th - June 1st	● Communicate with mentors to further develop this project plan in more detail ● Determine a detailed list of required assets (textures, models, etc) and explore ways to collect these assets, or find a suitable substitution. ● Investigating deliverable C, on pathfinding and performance optimizations. ● If SUHAS' MR proposal is also accepted, determine potential overlap/conflict between projects and determine how to avoid these issues.
Coding Begins June 1st - June 8th	● Start and Finish 2c (Modification of Dynamic Cities) ○ Add a 'maximumDistance' value to the city generator, to prevent city generation in spawn area ○ Modify the growth rate of city generation in the world ● Start 3 (Fixing Immersion-Breaking Issues) ○ Use investigation done in the bonding period to implement bug fixes. ● Start and Finish 2dii (Increase Block Break Time): ○ Adjust the hardness of stone, sand, and wood in the world generator.
June 8th - June 15th	● Start and Finish 1c (Modifying Thirst Mechanics) ○ Reduce the number of wells that spawn in a city. ○ Modify wells so they can be drunk from directly, without spawning a water cup. ○ Add purchasable water cups which can be filled in the well. ○ Add a 'useFactor' to wells which causes the well to dry up if it has been used too frequently. Replenishes over time. ○ Increase the rate of player thirst.
June 15th - June 22nd	● Start and Finish 1d (Modifying Hunger Mechanics) ○ Add SimpleFarming as a new dependency to the module, along with AdditionalFruits & AdditionalVegetables ○ Add a farm "building" to city generation, using a building generator.

	○ Add the new fruits and vegetables as purchasables in the marketplace ○ Adjust rate of hunger to be more suitable for gameplay.
June 22nd - June 29th	● Start 1b (Personalities of NPC Characters) ○ Add name generation for all NPC characters, which will show up on the top-of-screen tooltip when the player is looking at the character. ○ Add a label which appears over a character's head when an NPC has been previously interacted with (dialog has been added the week prior in SUHAS's proposal). ○ Add differences to characteristics between characters, such as: ■ Physical Size ■ Slight tint in colour ■ Movement Speed
Evaluation 1 June 29th - July 6th	● Wiki documentation and clean up for work done in the last four weeks. ● Merge outstanding PRs, to prepare for the next week of work.
July 6th - July 13th	● Continue 3, with more performance enhancements based on discoveries made during the week. ● If not already complete, 3b (Character Pathfinding) should be fully resolved this week. ● Start and Finish 2di (Prevent Spawning with Tools) ○ Remove all items from default inventory ○ Add console command to supply player with default inventory ○ Add items in default inventory to city marketplaces
July 13th - July 20th	● Start 2a (Addition of new discoverables) ○ Create these buildings which will contain treasures: ■ A treasure chest ■ A small shed-like building with a chest inside ■ An abandoned, slightly destroyed house with a chest inside ■ A deep well with a chest in the water ○ Add a 'DiscoverablesRasterizer' to select locations of these new treasures around the map.

	○ Expose noise generator with a 'getNoiseValue()' function. ○ Append a new 'DiscoverablesRasterizer' to the world generator to add these new structures to the world.
July 20th - July 27th	● Start and Finish 1a (Addition of Valuable items) ○ Add various valuable minerals to the module (either through CoreBlocks or Terasology/Minerals) ○ Add various jewelry items to the module, such as crowns, necklaces, jems, etc. ○ Make the above items purchasable in city marketplaces. ○ Tie in with current ore generation systems, to add mineable minerals which can be sold for cash ○ Add 'Terasology/Caves' to the module, to allow generated ores to be more easily found.
Evaluation 2 July 27th - August 3rd	● Wiki documentation and clean up for work done in the last three weeks. ● Merge outstanding PRs, to prepare for the next week of work.
August 3rd - August 10th	● Finish 2a (Addition of New Discoverables) ○ Create a prospectors GPS item. This item, when held, will beep when the player is travelling closer towards the treasure that this GPS is tracking. When the treasure is found, the GPS changes colour, and becomes effectively useless. Use 'getNoiseValue()' in TreasureFacet to locate the nearest treasure, even in unloaded chunks. ○ Add these items to be sold in the market for a high price. When bought, they will point towards the closest unfound treasure.
August 10th - August 17th	● Start 1a (New Dangers outside Cities) ○ Add the MawGooey module as a dependency to this module. Also copy the skeleton prefab from GooeysQuests into the game. ○ Add lighting (with torches) to existing city buildings, to greater contrast the difference between inside and outside the cities at night. ○ When night falls (tracked similarly to the 'night' behavior from last GSOC), add a check to see

	if the player is inside a settlement. If the player is not, then spawn enemies in the area at a set frequency. ○ Add these new enemies to the minimap
August 17th - August 24th	● Finish 1a (New Dangers outside Cities) ○ Add a UI/audio indication of nighttime danger somewhere on the screen (either the entire screen darkening, a time display that turns red, etc.) ○ The enemies will take damage upon entering a settlement. ● Finish 1b (Personalities of NPC Characters) ○ Modify needs reduction rates of all characters to randomly be selected on spawn (some characters will get hungry quickly, others will almost never get tired, etc.)
Final Evaluation August 24th - August 31st	● Wiki documentation and clean up for work done in the last three weeks. ● Merge outstanding PRs, to prepare for the next week of work. ● Prepare for the final evaluation!

Stretch Goals

1. **Predetermination of Settlement Locations:** Right now, the locations of settlements are only determined when the player is in proximity to the settlement. It would be best if the locations of these settlements could be pre-determined, much like how treasure locations in goal 2a can be determined. That way, the player could discover travel routes to undiscovered cities. This would require major changes to the current structure of DynamicCities.

2. **Combat System enhancements:** The only combat currently in the game either comes from the dart gun, or just from enemies walking into the player. This should be enhanced with better weaponry, such as various guns, knives, or more robotic-type weapons, such as shock devices or turrets.

3. **AI Persistence System:** Now that characters have names and personalities, any character that has been interacted with should be saved and preserved. That way, the player can keep in contact with the cast of characters that they meet in the game world.

4. **Cross-city interaction:** The activities in Metal Renegades so far only involve one city. It would be best for multiple cities to be involved, with the saved characters from stretch goal #2 able to travel between these cities.

5. **Addition of Sound to the Metal Renegades World:** The western world of Metal Renegades seems more like a silent movie at the moment, with the only sounds coming from the player itself. With the use of free assets, this world can be brought to life with integrated music or sound effects.

6. **Monster attacks on Settlements:** Currently in goal 1a, monsters spawn outside cities to deter the player away from travelling outside at night. It would be a nice feature to have periodic nighttime attacks on settlements, where a pack of monsters invade. The player must defend the town against this threat.

7. **Abandoned Mineshafts:** Much of this module is about exploration, it would be ideal to have discoverable mineshafts placed around the map, and change ore spawning so these mineshafts are the only way to gather essential minerals. This would greatly award exploration and risky travel outside of cities.

About Me

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More about Me

I am a first year science student at Memorial University of Newfoundland and Labrador. I plan to study computer sciences as a major for my program.

I have been with Terasology for over a year now, having participated in GCI 2018 as a student finalist, then in GSOC 2019 working on the Metal Renegades project, and also participating in GCI 2019 as a mentor. Besides this experience, I have 3-4 years of hobbyist programming experience in Java, Lua, HTML/CSS, and more.

Why me?

I believe that I would be a great fit for this project. I have a long period of experience with the Terasology community, and a deep familiarity with the codebase of Metal Renegades (being

a co-creator). My performance with GSOC last year shows my capabilities of taking on a large project. I would love to do more great work on the Metal Renegades project again this summer!

