Defiant Planet: Progress Report 3

Guardian Entertainment

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Progress Report

After completing and demoing our technical prototype, we worked on our level design document and various production tasks for the alpha release. Given that our game is an RTS, our level design will almost exclusively involve creating maps that encourage a competitive environment between the player and opponent and provide situations that highlight the sorts of strategic decisions and trade-off analyses we want our players to make. For example, there may be a spot on the map that is easy to defend but has poor access to resources and another spot on the map that is hard to defend but has excellent access to resources. The player must decide how he/she wants to settle such trade-offs in response to the dynamic challenges provided by the opponent and hostile environment.

For alpha release, we worked on four major areas: code maintenance; behavioral AI controllers for the units; new features like buildings, environmental impact tracking, and environmental threat spawning; and an in-game level editor (which works by serializing and deserializing our game and controller states). Although we made progress in all of these areas, we were unable to accomplish all we had hoped by the demo date. In particular, demonstrating our ideal gameplay is highly dependent on the behavioral AI controllers (for movement, targeting, and combat) and the environmental logic. The behavioral AI is the area that is most lagging - mostly due to the fact that filling it out has proven more complex (or at least more time-consuming) than anticipated. Most of the progress made on behavioral AI was under the movement category since movement is required for targeting, which is required for combat. At the moment we have pretty functional squad-based pathfinding but the other areas need a lot of work. We were able to get most of the environmental logic implemented, but the environmental responses are dependent on combat events against capital generators (which we are treating as buildings on the environment's team), so we are currently unable to view and/or test our environmental responses given the unfinished state of our game's combat AI. Speaking of AI, we had hoped to get some basic work done on the strategic AI for the opponent as well, but we will now be pushing that back to the Release milestone because we need to finish everything left unfinished on the Alpha to do list for Beta.

Activity Breakdown

All: 3 hours total
3/18: Meeting to plan activities for Alpha development phase (1 hour)
3/25: Meeting to work on level design document (1 hour)
3/27: Meeting to work on level design document (1 hour)

Samantha Chen: 23 hours total work time
Sam was primarily involved in implementing support for the environmental events, including impact generation logic, region-based impact tracking, and impact-based unit spawning logic (eg., where should the environment decide to spawn units in threatened areas and which units should it spawn?). She also did some preliminary work on the worker behavior scripts.

Involved in:
- Implementing impact generation logic (4 hours)
- Implementing regions and region-based impact tracking (6 hours)
- Implementing impact-based spawning logic (8 hours)
- Implementing some of the worker scripts (2 hours)

Christopher Chung: 15 hours total work time
Chris worked on the UI aspects of the game. These include the art on the loading screens and menu screen. He also composed some music for the menu and selected sound effects to be used throughout the game. He also began work on UI elements like buttons for squad and unit commands. He contributed to the storyboards for the level design document as well.

Involved in:
- Creating storyboards and illustrations for the level design document (2 hours)
- Designing the loading screen (2 hours)
- Designing the menu screen (3 hours)
- Creating the team logo (2 hours)
- Composing music and selecting sound effects (3 hours)

Rebecca Coombes: 15 hours total work time
Rebecca worked on completing the first few assets for the final vision of the game. These assets included a soldier unit for each of the two teams, a barracks model, and a tree meant to serve as a capital generator. Each model includes a texture that can be easily tinted to differentiate between teams. She also contributed to the storyboards for the level design document that showed the tutorial level. Some work was started for other units but was not completed for this release.

Involved in:

- Creating storyboards and illustrations for the level design document (2 hours)
- Polishing up the soldier unit (6 hours)
- Creating the barracks asset (3 hours)
- Creating the tree asset (1 hour)

Tatsuhiro Koshi: 17 hours total work time

Koshi was mainly responsible for working on the building objects and their behaviors associated with user inputs. Specifically, he worked on the building data and the responses to user commands by creating different events. He also made some modifications to the collision controller to support building-unit collision.

Involved in:

- Implementing the RTSBuilding class and handling associated data (6 hours)
- Implementing building behavior scripts (4 hours)
- Implementing building-related UI input handling (2 hours)
- Fixing the unit-building collision code (2 hours)

Trevor Slaton: 30 hours total work time

Trevor focused mostly on hooking up then improving the pathfinding and movement behaviors of units. Unfortunately, he ended up discovering that a lot of what we were hoping to support in the way of unit pathing behaviors is tricky and time-consuming to get right, so he did not get to nearly as much work on the rest of the unit behaviors as he had hoped. For example, he has since decided that some approaches to formations and potential fields are completely infeasible. Still, he improved and expanded the way that units store their states and orders (derived from user inputs) so that these behaviors can be implemented in the near future.

Involved in:

- Hooking up and fixing some issues with A* (2 hours)
- Implementing potential field-based navigation to supplement A* on the grid (12 hours)
- Attempting to add support for squad formations, which have now been cut (10 hours)
- Replacing the unit movement controller with the squad movement controller (2 hours)
- Expanding units' states in preparation for implementing their behavior FSMs (1 hour)

Cristian Zaloj: 90 hours total work time

Cristian focused on refactoring the entire game engine, optimizing unit behavior decisions, fully separating the view from the models from the controllers, implementing fog of war, programming all the UI and screens, making the graphics for the intro screens, fixing scripts, the full implementation of the game state serialization and deserialization, adding buildings to the map, creating the particle engine, reworking the dynamic code compilation to be programmer-friendly, and answering numerous questions.

Involved in:

- Almost everything related to programming (87 hours)

Productivity Analysis

Quite a bit of work went into this alpha release, but it was not enough. Most crucially, we failed to have visible, testable gameplay in our Alpha release. The controllers necessary for enabling combat and environmental interactions will be a primary focus for Beta release.

Milestone Predictions

We had originally hoped to be working on level design and strategic AI for the game's opposing team for Beta. However, we were unable to meet all of our goals for alpha, so we will mostly be pushing those items back until the Release milestone. For Beta, we basically want to finish implementing everything we were working on for alpha. These tasks include the following:

I. Controllers

- Update targeting behaviors to allow both passive and aggressive fog-aware targeting
- Enable units to invalidate and recalculate their paths if the static environment changes
- Make pathfinding fog-aware and capable of chasing moving targets
- Improve combat by halting units when attacking and requiring line-of-sight for damage
- Implement worker resource harvesting/capital depositing behavior
- Implement worker build behavior

II. Unfinished Features

- Hook up, verify, and test the environmental logic added during alpha development
- Finish the environmental spawning and AoE targeting logic (emphasis on AoE)
- Finish adding support for buildings (headquarters, barracks, and capital drops)
- Add indicators for units and impact regions to the mini-map

III. In-Game Level Editor

- Finish (de)serialization of necessary controllers and controller states as these develop
- Prevent controllers from running unless toggled on in the editor
- Overlay a UI or keyboard control mapping on the level editor

IV. Assets

- Finish worker assets
- Finish at least two more soldier type assets (to achieve rock-paper-scissors balance)
- Finish the ore (capital generator) asset
- Finish headquarters and possibly capital drop asset
- Finish environmental units - treants and golems (optional but highly desired)
- Finish UI assets (mainly buttons) for squad and unit commands and/or level editor

Test For Acceptance

Excellent - We get back on track by getting the first two major categories above almost completely finished and make good progress on the assets. We probably won't be using the level editor very much until the next milestone, so we could delay improving it until then.

Acceptable - We completely nail either unit behavior or environmental behavior. We will need to make more progress on unit behavior than we have at the moment in order to demonstrate environmental behavior.

Risk Assessment

We have too much to do to miss much in this next milestone since we are running behind. Hitting the *acceptable* level above should be fairly doable, but if that is all we get done, we still won't be completely caught up and our Release milestone will become high risk. So there is some notion of a higher risk across this milestone and the next one.

Activity Breakdown

All: est. 4 hours total
We will meet as needed to make sure our direction is good and to complete whatever documents are required for the course in the during the Beta development phase.

Planned tasks:
4/8: Meeting to discuss Beta plans (1 hour)
4/12: Meeting to demonstrate Starcraft/Age of Empires to our non-RTS-player team members (1 hour)
4/15: Meeting to discuss and work on game manual (1-2 hours)

Christopher Chung: est. 20 hours total
Chris will continue working on the control buttons for squads and units. He will also make a meter to show the user the amount of capital he/she has. Any additional time will be spent aiding in asset creation by painting textures or sculpting map terrain.

Planned tasks:
- Finishing squad/unit command buttons (5 hours)
- Creating a capital meter (1 hours)
- Creating a more suitable mouse pointer (3 hours)
- Unit texture painting (3 hours)
- Map sculpting and/or texturing (4 hours)

Rebecca Coombes: est. 26.5 hours total
Rebecca will work to complete at minimum the worker unit for each team, ore used for mining capital, a headquarters model, and two additional types of soldiers for each team. If time permits, environmental combat units will be created as well. These include a tree-like unit that will spawn in response to damage done to flora and a rock-like unit that should spawn in response to damage done to ore.

Planned tasks:
- Completing the worker unit (3 hours)
- Completing the ore (1.5 hours)
- Completing two more soldier types (8 hours)
- Completing the headquarters (4 hours)
- Making two environmental units (6 hours)

Tatsuhiro Koshi: est. 21 hours total
Koshi will be working on the scripting and logic for the buildings as well as improving the balancing for the units now that combat is slightly implemented. He will also be using the level editor to create some levels and scenarios for the player to be playing.

Planned tasks:
- Making scripts for buildings (3 hours)
- Making scripts for game command buttons (5 hours)
- Improving the balancing of the existing unit types (5 hours)
- Working on the level designs (4 hours)

Trevor Slaton: est. 44 hours total
Trevor will focus on getting all of the unit behaviors implemented (both for combat units and workers), improving pathfinding, and potentially helping out with any building or environment issues.

Planned tasks:
- Improving default squad/unit targeting (3 hours)
- Improving default combat behavior (6 hours)
- Improving pathfinding, particularly with regard to fog of war and moving targets (8 hours)
- Improving worker behavior (2 hours)
- Adding support for more complex combat behaviors (8 hours)
- Finalizing the building types and unit types we should have in the game (3 hours)
- Laying out 1-3 levels (2+ hours)
- Shit happens (8 hours)

Samantha Chen: est. 26 hours total
Sam will focus on getting the logic behind AoE environmental effects up and running, as well as rounding out any issues currently existing in the environmental logic code. She will help out with unit behavior scripts once the environment is working.

Planned tasks:
- Making sure environment works (12 hours)
- Messing around with parameters and playtest (4 hours)
- Improving worker scripts (6 hours)

Cristian Zaloj: est. 60 hours total
Cristian will focus on adding in all the necessary gameplay elements and polishing up all the UI to make it easier for the designers to roll out content for our game.

Planned tasks:
- Adding support for building to present buttons (4 hours)
- Adding support for buttons to apply logic to the game state (3 hours)
- Adding gameplay elements (10 hours)
- Making the level editor designer-friendly (6 hours)
- Adding more particle effects (lightning/fire/lasers/explosions) (5 hours)
- Developing UI for screens (5 hours)
- Fixing more scripts (3 hours)
- Adding heatmap of impact to the mini-map (for toggling) (2 hours)
- Showing teams on the minimap (1 hour)
- Coming up with cool ideas (9 hours)
- Shit happens (8 hours)