

CA1 – Expanded Design Document

How it evolved

AI

My initial version already had some of the new features already in it, my enemy the owner already was using AI so all I did to that was polish it by making it return to the gate to check on it every few seconds so the rat couldn't just hide the entire game (itd be boring) this adds a form of excitement and suspense when you are playing.

This code snippet shows that it calls "GoToScheduledSpot()" and is able to be interrupted if he sees the player on the way.

Optimization

The optimization was something I hadn't fully thought of in the first one that's why I tried to focus on it in this assignment. The large amount of mesh "grass" that were actually just small terrain trees that I painted, were very heavy on the computer, so I first of all reduced the amount of them to lower draw count and then added occlusion culling to the project so it ran smoother.

```
if (!goingToScheduledSpot &&
    !chasingRat &&
    currentObject == null &&
    sessionManager.interactableQueue.Count == 0 &&
    scheduleTimer <= 0f)
{
    GoToScheduledSpot();
    return;
}

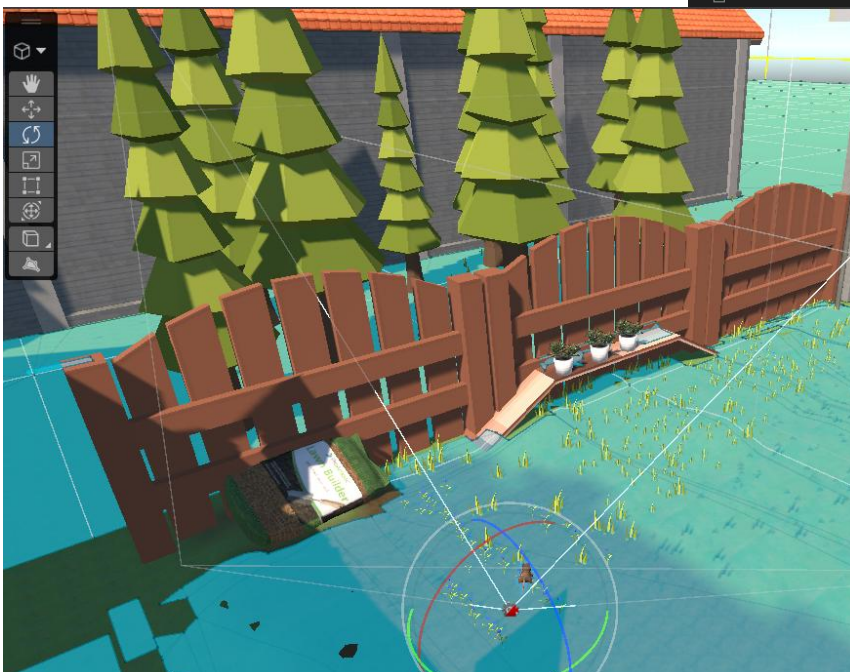
if (goingToScheduledSpot)
{
    // PRIORITY OVERRIDE: if rat appears, interrupt schedule
    if (chasingRat && target != null)
    {
        goingToScheduledSpot = false;
        hasWanderTarget = false;

        if (!agent.pathPending)
        {
            agent.SetDestination(target.position);
        }

        return;
    }

    // continue going to scheduled spot
    if (HasReachedDestination())
    {
        goingToScheduledSpot = false;
        scheduleTimer = scheduleInterval;
        hasWanderTarget = false;
    }

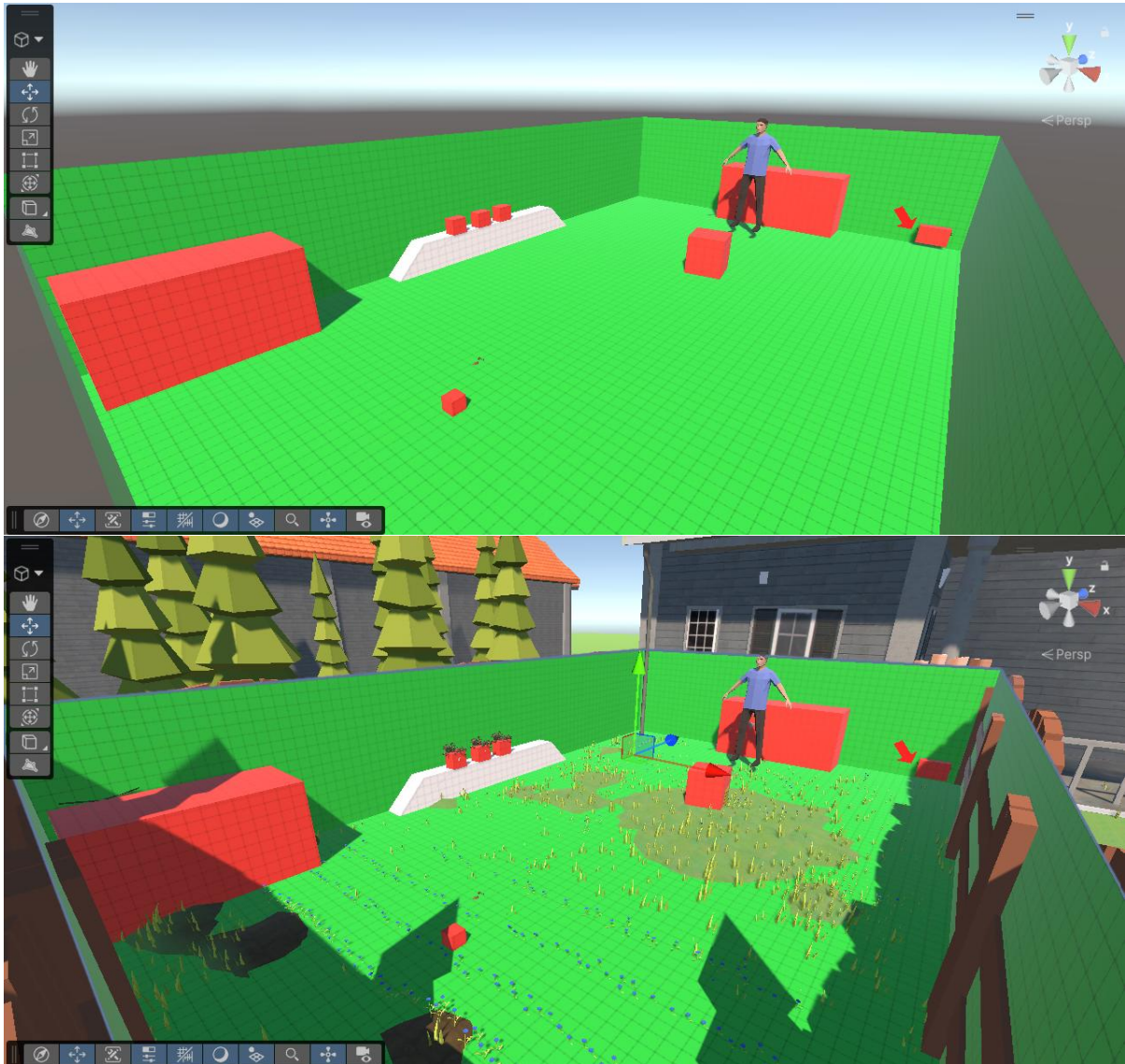
    return;
}
```

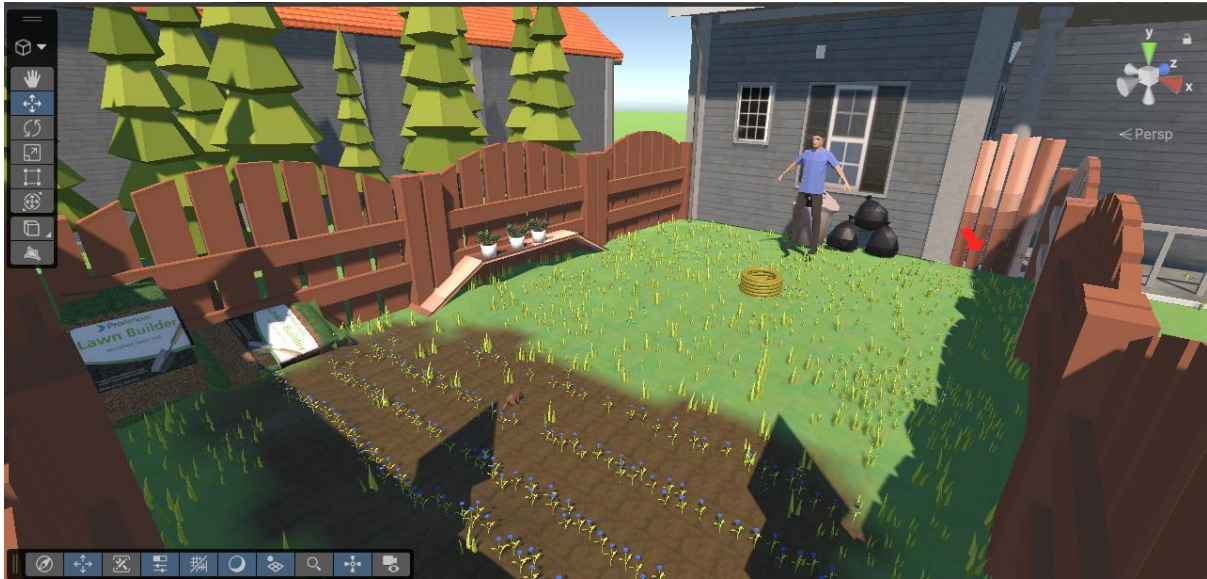


ProBuilder Environment Work

I hadn't used probuilder initially when I was making this project but I did convert the world I was in to a proBuilder area, to demonstrate what it would look like.

I would take a different approach next game I make by building it out in probuilder first as I can get an idea of what it would look like before making any commitments.





Audio Integration

The audio elements of the project were lacking in the first submission, as most of the sound was flat and one-dimensional. After covering spatial blend in a recent class, I implemented it into the project and added audio cues to several interactable objects that previously had none. For example, I added corresponding sound effects to the sprinkler and hose that react with spatial awareness. I also converted the owner's footsteps to use spatial blend, although they can still be difficult to hear clearly during gameplay. In addition, I started using Unity's Audio Mixer component, which provides much better control over audio sources and volume levels by separating them into categories such as effects, ambience, music, and interactables.

UI & Player Feedback

I had already added a custom-painted health bar to the game, and the timer system was also already implemented, so these areas did not require much additional work. I included popup UI prompts that appear when the player gets close to interactable objects, helping guide the player naturally without relying on a large instruction list on screen. To direct the player towards the gate they needed to scratch at, I replaced the large red arrow, which felt immersion-breaking, with the more subtle and recognizable "yellow paint" approach often used in games. This could also have been achieved through other methods, such as using a block of cheese or directional lighting to attract the player's attention, but for simplicity and clarity I chose the yellow paint solution.



Testing and Iteration

I repeatedly played through the game while testing features and polishing smaller details. For example, in the image above the paint was appearing in front of the progress bar, which was a simple fix by adjusting the hierarchy order, but small issues like this are important to address when aiming for a polished experience as they demonstrate attention to detail. I also had close friends playtest the game, and I was pleased to see that they were able to understand and play the game without needing any instructions from me. This showed that the player guidance and overall user experience were working effectively.

Conclusion

Overall, this project evolved significantly from the original submission through improvements in AI behaviour, optimization, audio design, UI feedback, and overall polish. While the core gameplay remained the same, the newer additions helped create a more immersive and engaging player experience. Features such as spatial audio, improved enemy AI, occlusion culling, and clearer player guidance all contributed to making the game feel more complete and professional. The testing and feedback process also highlighted the importance of small details and iteration when developing games.