Rentabl Go Go

TestVroom Team 16

Team members

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Project Overview

We created a driving simulator for Parkinson's Patients to test their reaction times and multitasking skills. Driving is a major safety concern for patients, who may have hand tremors and cognitive impairment. The simulator was created in Unity3D and grades a patient by how well they can follow 15 random directions and regular street laws. Our project aims to help caretakers see their patient's current symptoms and also help patients practice their reaction time.

Needfinding

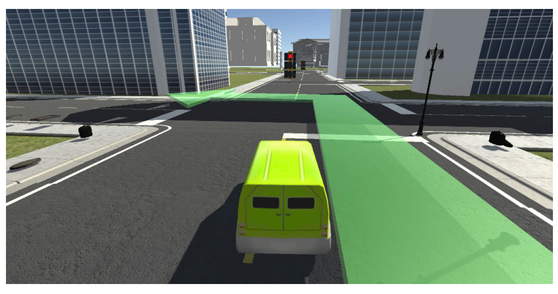
We started the hackathon by interviewing Parkinson's Patients to better understand their lifestyle. After brainstorming, we were interested in three common themes:

- Reaction Time: Test their driving, as PD is known for decreasing reaction times and creating body spasms.
- Sleep quality/REM Sleep disorder: Sleep Tracking, being able to track patient sleep cycles and potential dream acting.
- Cognitive thinking: Cognitive Stimulus, a mental challenge that would be taken alongside exercise to improve patient cognition.

Problem statement

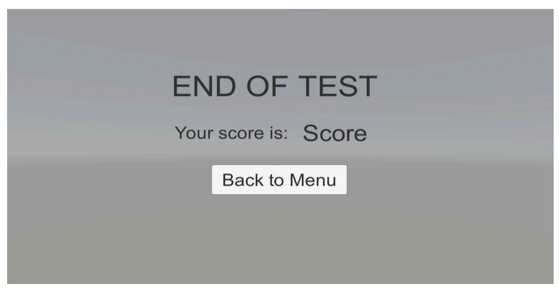
- **Reaction speeds while driving:** We decided on driving because we liked its novelty and felt that it was an unaddressed safety concern. We wouldn't replace the DMV test but rather create a test to reassure patients of their skill.
- **Solution:** Parkinson's Patients need a driving reaction-time test to improve and verify their cognitive and multitasking ability on the road.

Implemetation

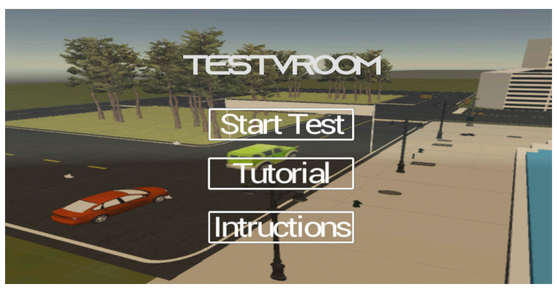


Navigation System

Terrain



Score System

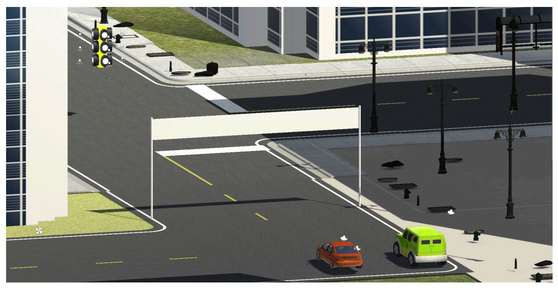


Tutorial Practice

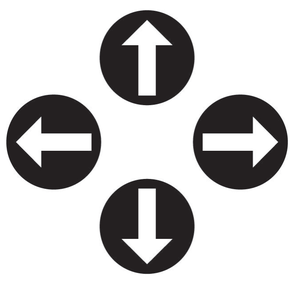
We created a 3D driving simulator using Unity3D so patients could drive around and receive a score based on their performance. We built a city and implemented a car using downloaded prefabs. To test them we had a navigation system give random directions and a grading system based on how many missed turns and crashes. We realized that our simulator may not be familiar with most people, so we created a tutorial when they could learn the sensitivity and features of the game.

User Testing

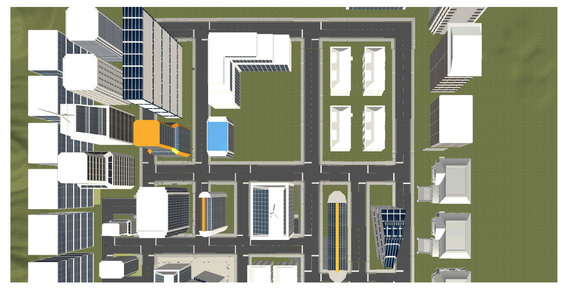
Increase Sensitivity



Adjusted Traffic Timers



2D Navigation Arrows



Flush Out Tutorial

We interviewed four Parkinson's patients to test our simulator. We made two tests of different sensitivity in order to see which variant was preferred. We asked for initial and post evaluations to understand their driving experience. General feedback included changing the navigation system to 2D arrows, increased sensitivity, flushed out tutorial, and adjusted traffic timers.

Conclusion

We believe that our driving simulator can help caretakers and doctors better understand the patient's driving condition and ability to multitask. Our test may also be used as a safe environment for the patient to practice driving and also understand their current driving condition. Being given a score may help some patients accept that Parkinson's is affecting their lives.