TEB1113/TFB2023: ALGORITHM & DATA STRUCTURE

Performance Report on Drone Swarm Simulation

Homework 3

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1.0 Device Specification

Model: Victus 15

RAM: 16GB

Storage: 500GB

Processor: AMD Ryzen 5 7535 HS

GPU: Radeon Graphics

Operating System: Windows 11

2.0 Application Domain

2.1 Introduction

This project simulates a driven drone swarm for security, with drones programmed to patrol within a specified area. As they approach a boundary, they change color, and if they escape beyond a certain radius, they self-destruct to prevent straying. The drones can also be self-destructed based on their unique Drone ID. Key behaviors like alignment, avoidance, and cohesion ensure the drones move cohesively as a group, demonstrating the potential for controlled and autonomous applications in security.

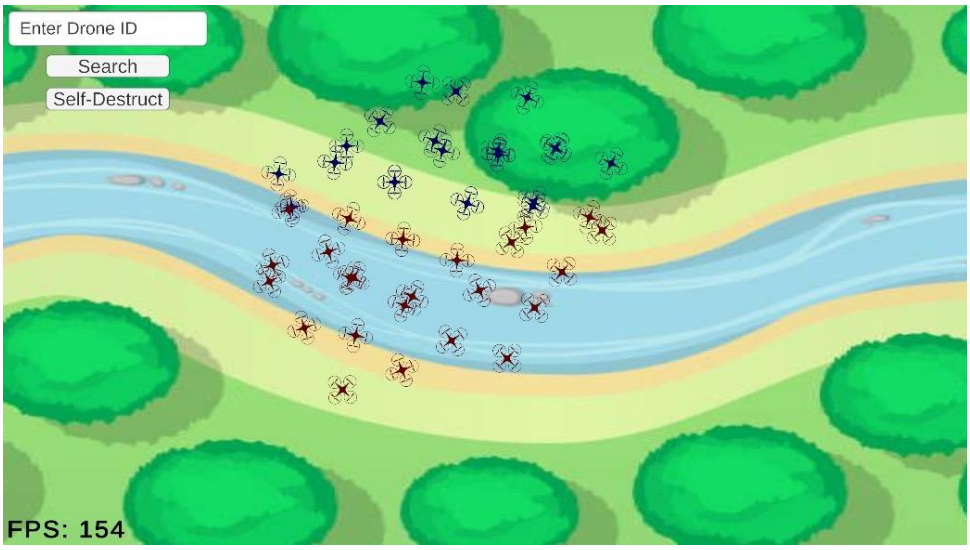
2.2 Performance analysis

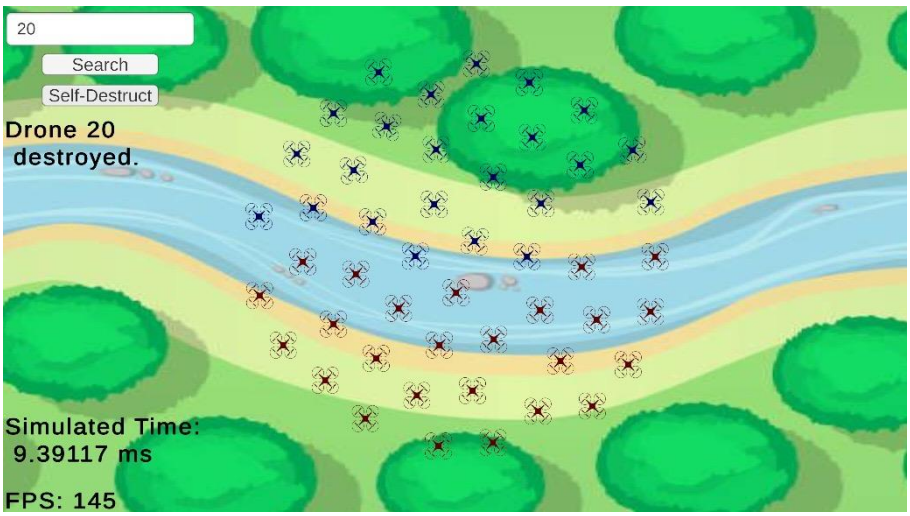
This application managed to reach high FPS rates ranging from 90-200 and sometimes it reached up to 206. The response time for the whole application takes around 16 milliseconds plus minus to execute the search and termination. This shows that the application is efficient enough to operate without facing any lagging issues.

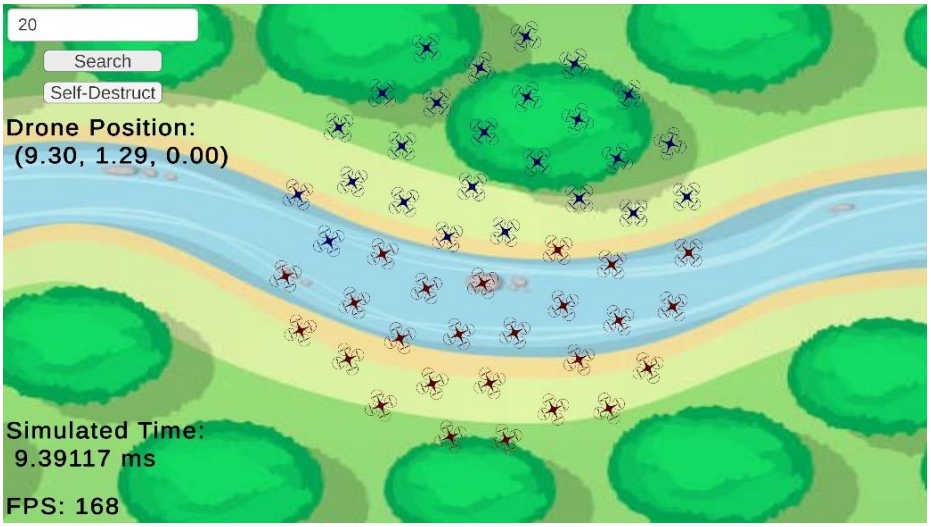
This application was run on Victus 15 with AMD Ryzen 5 7535 HS as its processor with decent single threaded performance as well as having 16 GB RAM and Radeon graphic as its GPU. This device manages to operate the application without any problem as the processor is top notch and it has sufficient memory to perform any operations. However, it will be much better if the processor supports multithreading, then complex flocking behavior will benefit more. The storage would not affect the application operation unless many assets are being loaded during runtime.

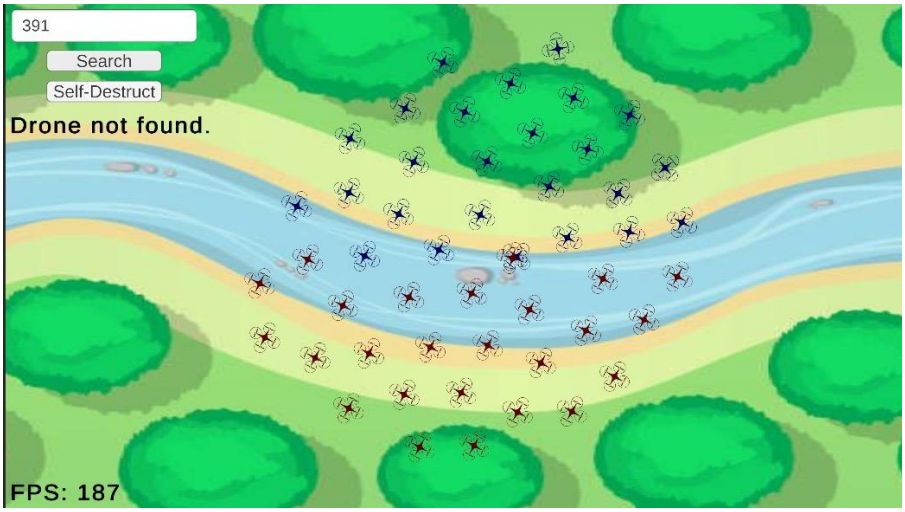
2.3 Drone Simulation


DRONE
SIMULATION
START


Enter Drone ID
Search
Self-Destruct
FPS: 154


20
Search
Self-Destruct
Drone 20
destroyed.
Simulated Time:
9.39117 ms
FPS: 145


20
Search
Self-Destruct
Drone Position:
(9.30, 1.29, 0.00)
Simulated Time:
9.39117 ms
FPS: 168


391
Search
Self-Destruct
Drone not found.
FPS: 187

2.4 Assets


START