# Part 1

Below is a new flight map with new obstacles created in the obstacle generation method. The map score with my implementation is 21.28. I know that the implementation is correct because the rapidly exploring random trees (RRT) algorithm responds to my new map. I also increased the number of nodes that the algorithm would run with to ensure that in enough time, the algorithm would allow the drone to find the best path to the destination. My implementation of RRT also displays the proper waypoints. In the figures below, I show a flight path of a simulated drone take off, performing the searching algorithm via waypoint following, and landing. The integration of the algorithm is the same because I did not alter the RRT calls when I updated the number of nodes. This proves that my method is working and that my results are valid.
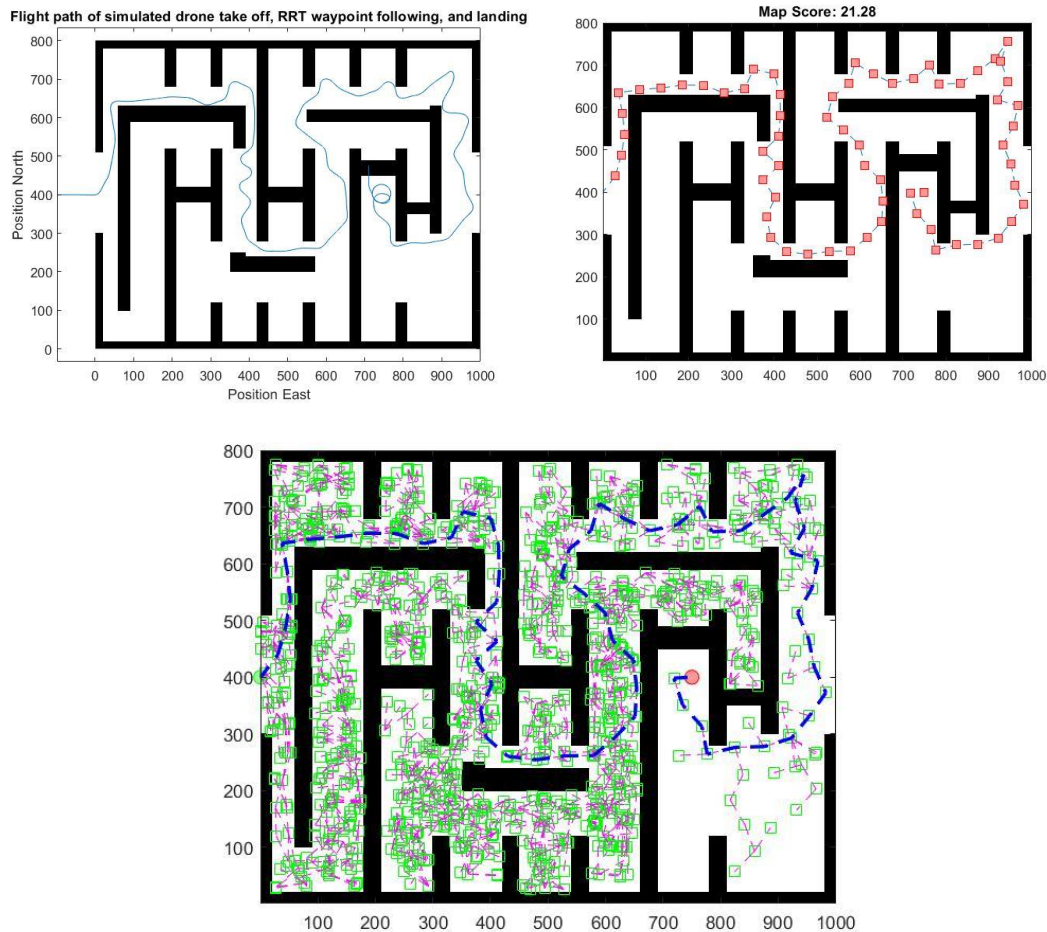
The figure above shows the waypoint following while the RRT algorithm is running.

Part 2

In the second part of the lab assignment, I updated the collision detection algorithm to ensure that the drones are staying 10m away from each other. The code that was implemented can be found below. Looking at the collision distance data, I can see that the code I wrote works because the collision distance (m) does not go beyond (lower than) the threshold distance of 10 meters.
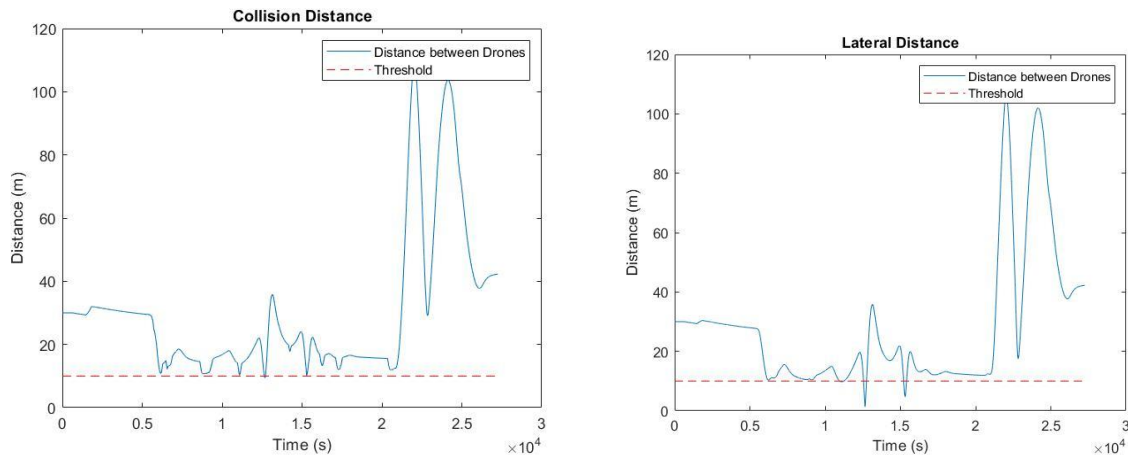
Code:

```
epx1 = ((pn2 - pn1) * cos(Xi1)) + ((pe2 - pe1) * sin(Xi1));
epx2 = ((pe2 - pn1) * cos(Xi2)) + ((pe2 - pe1) * sin(Xi2));
epy1 = (-(pn2 - pn1) * sin(Xi1)) + ((pe2 - pe1) * cos(Xi1));
epy2 = (-(pn2 - pn1) * sin(Xi2)) + ((pe2 - pe1) * cos(Xi2));

if (coll(i) < 35)
    if (epx1 > 0) && (epx1 < 50)
        if (abs(epy1) < 1)
            drone1.u.Height = drone1.u.Height-10;
            if (drone1.u.Height < 20)
                drone1.u.Height = 15;
            end
        else
            drone2.u.Height = drone2.u.Height - 10;
            if (drone2.u.Height < 20)
                drone2.u.Height = 15;
            end
        end
    end


    if (epx2 > 0) && (epx2 < 35)
        if (abs(epy2) < 1)
            drone1.u.Height = drone1.u.Height-10;
            if (drone1.u.Height < 20)
                drone1.u.Height = 15;
            end
            drone2.u.Height = drone2.u.Height - 10;
            if (drone2.u.Height < 20)
                drone2.u.Height = 15;
            end
```

```
            else

            end
        end
    end
```