Path planning for Aerial Robots

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Abstract—In recent times, increase in the usage of automobiles is causing difficulty in transporting goods between two places. As a result, aerial navigation of transporting goods through drones is gaining popularity due to reduced traffic and its ability to reach goal faster. But, aerial navigation also has difficulties such as avoiding collision with tall buildings, changing path to avoid dynamic obstacles etc. Due to these difficulties present, path planning of drones becomes crucial. Hence, there is a need to develop a path planning algorithm which finds the shortest path to reach the goal whilst avoiding static and dynamic obstacles. In this report, we implemented sampling based path planning algorithms to manuever the drone in both static and dynamic environment.

I. INTRODUCTION

Drones in recent times are being used for surveillance in military and for transportation purposes. Mostly recently, drone was used to transplant kidney. Hence, with the commercialization of drones it is important to use a path planning algorithm which can make the drone manuever when faced with random obstacle.

Figure 1. Drone delivering kidney

This report provides detailed implementation RRT and RRT* sampling based algorithms both in 2D and 3D and provides comparison. Furthermore, the algorithm has been developed to avoid dynamic obstacles. This report provides the simulation results of both static and dynamic obstacle avoidance in 3D.

II. PLAN OF ACTION