

Path Planning

Objective: Develop path planning techniques for UAVs that can be implemented in real-time on simple computational hardware.

Principle Investigators: Randy Beard, Tim McLain

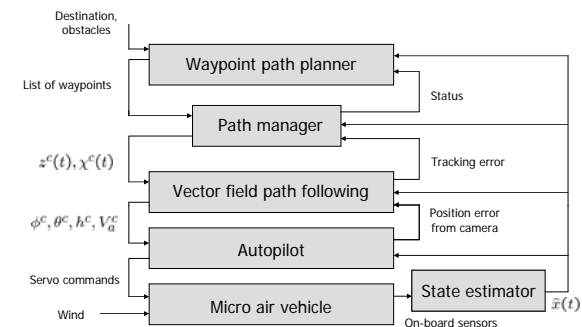
Sample Publication: Stephen Griffiths, Jeff Saunders, Andrew Curtis, Blake Barber, Tim McLain, Randy Beard, "Obstacle and Terrain Avoidance for Miniature Aerial Vehicles," Chapter 7 in *Advances in Unmanned Aerial Vehicles: State of the art and the road to autonomy*, edited by Kimon P. Valavanis, Springer Verlag, 2007.

Funding Source: AFOSR, AFRL/MN.

Problem Summary

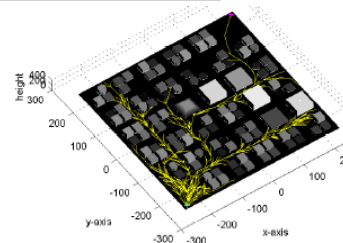
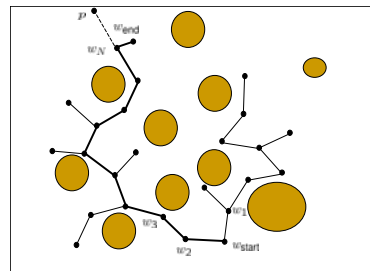
Given the current position of the UAV, a desired goal configuration, and a terrain map, plan a feasible path through the terrain.

Hierarchical decomposition of the problem into waypoint path planning and dynamic path following.



Approach

Developed path planning algorithms that use both the Voronoi algorithm and the Rapidly Exploring Random Tree (RRT) algorithm.



Results

First successful flight test in 2005.

Successful flight through rural canyon in central Utah.

Successful flight through simulated urban terrain

