

Lighter than air robots: guidance and control of autonomous airships

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Abstrak

This book familiarizes readers with a hierarchical decoupled planning and control strategy that has been proven efficient through research. It is made up of a hierarchy of modules with well defined functions operating at a variety of rates, linked together from top to bottom. The outer loop, closed periodically, consists of a discrete search that produces a set of waypoints leading to the goal while avoiding obstacles and weighed regions. The second level smoothes this set so that the generated paths are feasible given the vehicle's velocity and accelerations limits. The third level generates flyable, timed trajectories and the last one is the tracking controller that attempts to minimize the error between the robot measured trajectory and the reference trajectory.

This hierarchy is reflected in the structure and content of the book. Topics treated are : modelling, flight planning, trajectory design and control. Finally, some actual projects are described in the appendix.