An Efficient Strategic Deconfliction Algorithm for Lane-Based Large-Scale UAV Flight Planning

Thomas C. Henderson, David Sacharny and Michael Cline
University of Utah

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School of Computing
University of Utah
Salt Lake City, UT 84112 USA

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Abstract

Given a lane-based airway navigation framework wherein each lane is one-way, and intersections are handled by means of polygonal lane roundabouts, then it is possible to assign flight plans so that the set of all such plans is strategically deconflicted. That is, no two Unmanned Aerial Systems (UAS's) will ever get closer in a lane than the minimum allowed headway time (or distance) of each other. We describe here a method to determine all allowable launch times (i.e., strategically deconflicted) given a requested launch time interval and a set of scheduled flights. Scheduling a new flight is linear complexity in the number of scheduled flights.