An Efficient Strategic Deconfliction Algorithm for Large-Scale UAS Traffic Management

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

UUCS-20-010

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

30 June 2020

Abstract

We propose a lane-based airway navigation framework wherein each lane is one-way, and intersections are handled by means of polygonal lane roundabouts; 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) 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 has low complexity in the number of scheduled flights. Note that the method proposed here applies to all lane-based scheduling problems, e.g., in Urban Air Mobility (UAM) systems, automated warehouses, etc.