

VISITOR RESEARCH REPORT

Visitor Name: Mr. Alfonso Valenzuela

Area of Research: Separation Assurance

Period of Visit: July 18, 2011 – September 16, 2011

Goal:

The main scope of the visit was to develop criteria for intent-based implicit coordination.

Strategy:

The NASA Langley Formal Methods Team introduced the concept of criteria for state-based implicit coordination, i.e., the trajectories of the aircraft are defined as linear projections of the current position and velocity, and the coordination is achieved without any negotiation between aircraft.

Starting from these results, the intent-based case, where the trajectories of the aircraft are defined by flight plans, has been analyzed. The commonalities with the state-based case have been exploited.

Accomplishments:

A criterion for intent-based implicit coordination in the horizontal plane has been developed. In this criterion, each trajectory is discretized in intervals. In this way, the criteria for the whole trajectory is composed of criteria for each interval which, in fact, are modifications of the criteria for the state-based case. Simulations using a simple conflict resolution algorithm have been performed.

Future Work:

The following tasks have been identified:

- prove of independence and coordination of the existing criteria,
- extension of the criteria for the vertical profile,
- reduction of the length of the intervals to 0 (continuous criteria),
- development of criteria for other safety properties: divergence, repulsion...

Pending Publications:

The criteria for intent-based implicit coordination is planned to be published in a NASA report.

Seminar Presented:

A presentation with the title “Development of Criteria for Intent-Based Implicit Coordination” was given.