



Cooperative air traffic structuring

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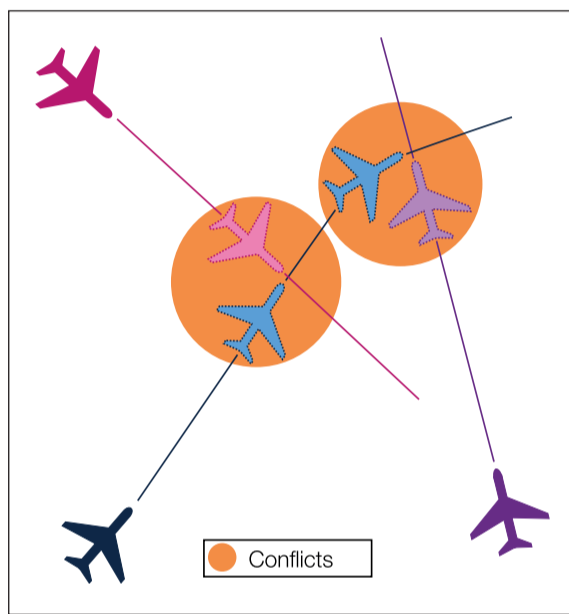
Cooperative Air Traffic Structuring

Multi-Agent System

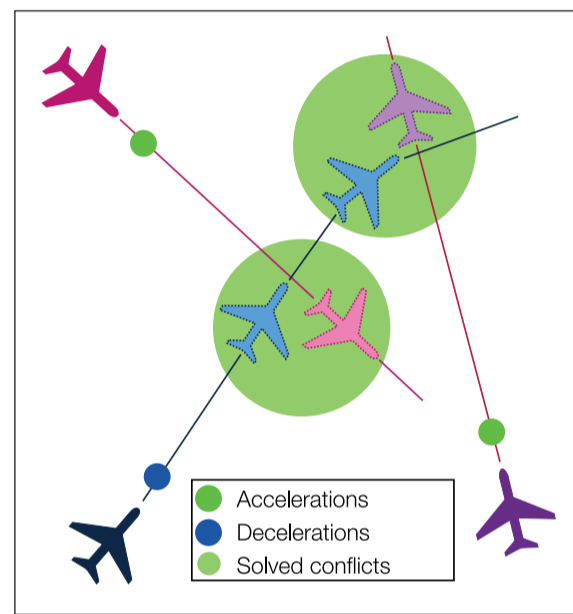
- Resilient, fast and scalable method for problem solving
- Composed of agents (aircraft) **cooperating** to elaborate their trajectories
- Decisions taken **by each aircraft**, based on knowledge of its **local environment**

Conflict Avoidance by Speed Regulation

- Aircraft send messages containing their estimated trajectories
- Each aircraft selects optimal speed changes based on this **shared knowledge**
- Speeds are selected within [-6%, +3%] of its optimal speed



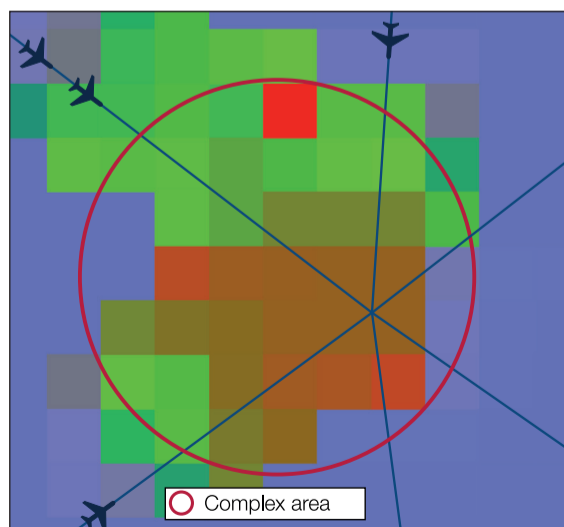
Without regulation, conflicts occur



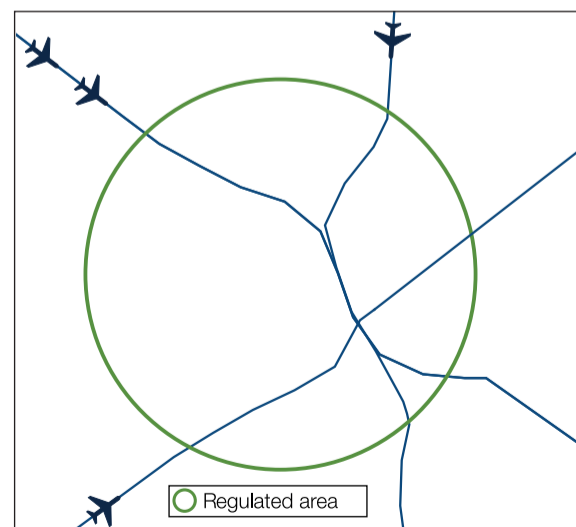
With speed regulation, conflicts are solved

Macro-Structuring of Air Traffic

- The system reduces traffic complexity by structuring trajectories into flows
- The traffic complexity is **monitored in real time**
- The route network is **dynamically adapted** to fit the traffic complexity



Unstructured traffic



Structured traffic