A Timing Verification Problem in Multi-UAV Systems

B. Andersson and D. de Niz

Multi-UAV System

Tight formation

Formation moving to the right

Collision avoidance needed

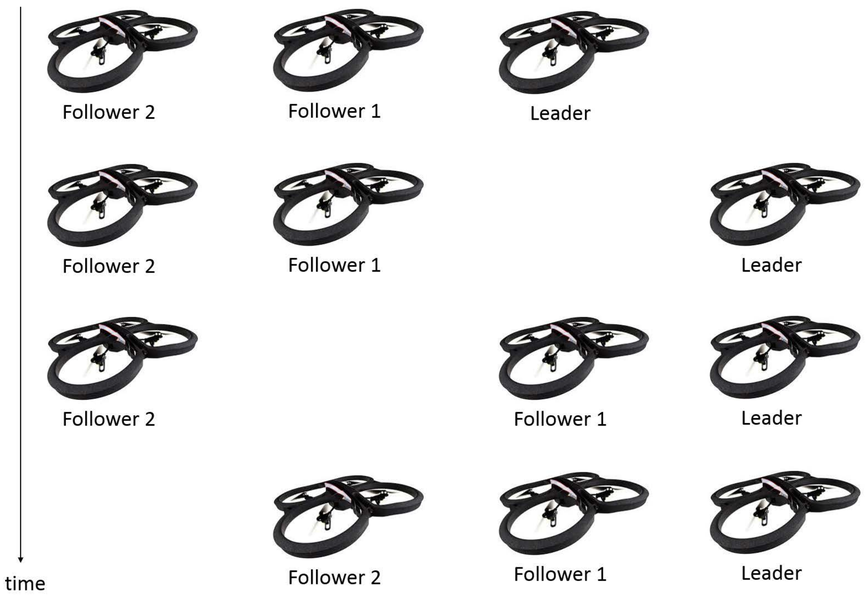
Collision Avoidance in Multi-UAV System

Best effort
Collision avoidance

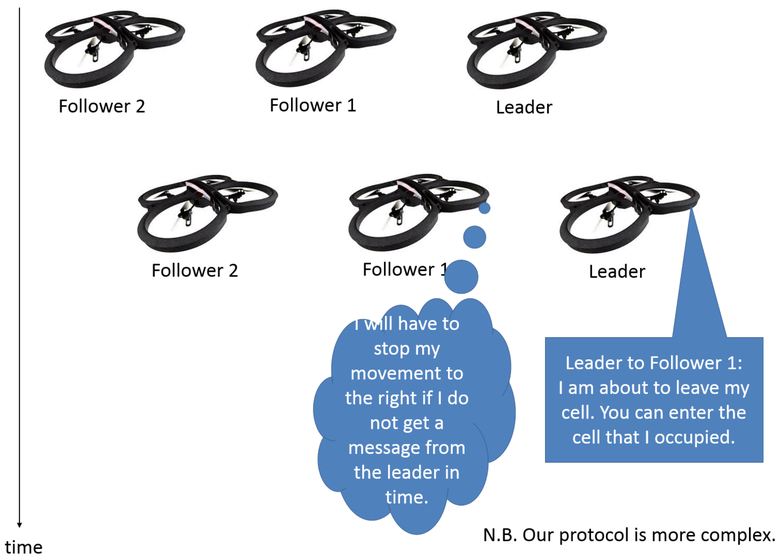
Verified
Collision avoidance
(Our focus)

Correct functionality
and correct timing

Straightforward Collision Avoidance Protocol

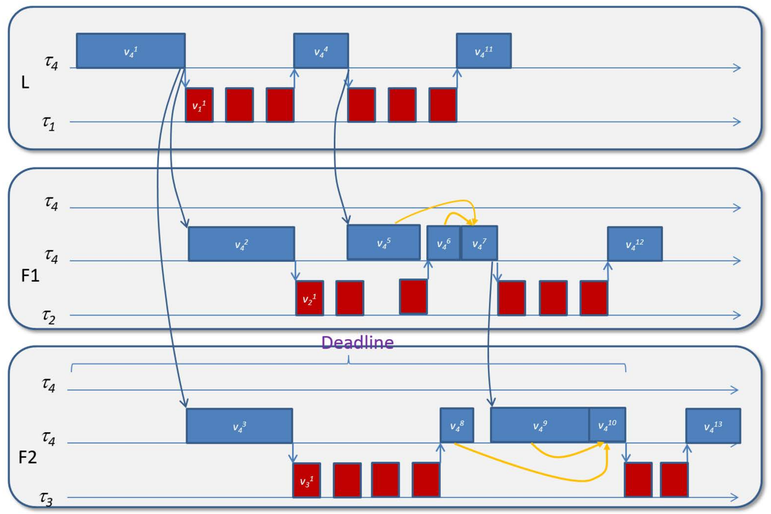


Better Collision Avoidance Protocol (Simplified)



N.B. Our protocol is more complex.

Model of the Software and Timing Requirements



Challenges

- A segment arrives (becomes ready for execution) when a predecessor segment has finished
- The state-of-the-art in computing delays in pipelines is not well developed.
- The state-of-the-art in computing delays for software with suspension is not well-developed

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This material is based upon work funded and supported by the Department of Defense under Contract No. FA8721-05-C-0003 with Carnegie Mellon University for the operation of the Software Engineering Institute, a federally funded research and development center.

DM-0003800