

# Collaborating Multiple System Instances of Smart Cyber-Physical Systems: A Problem Situation, Solution Idea, and Remaining Challenges

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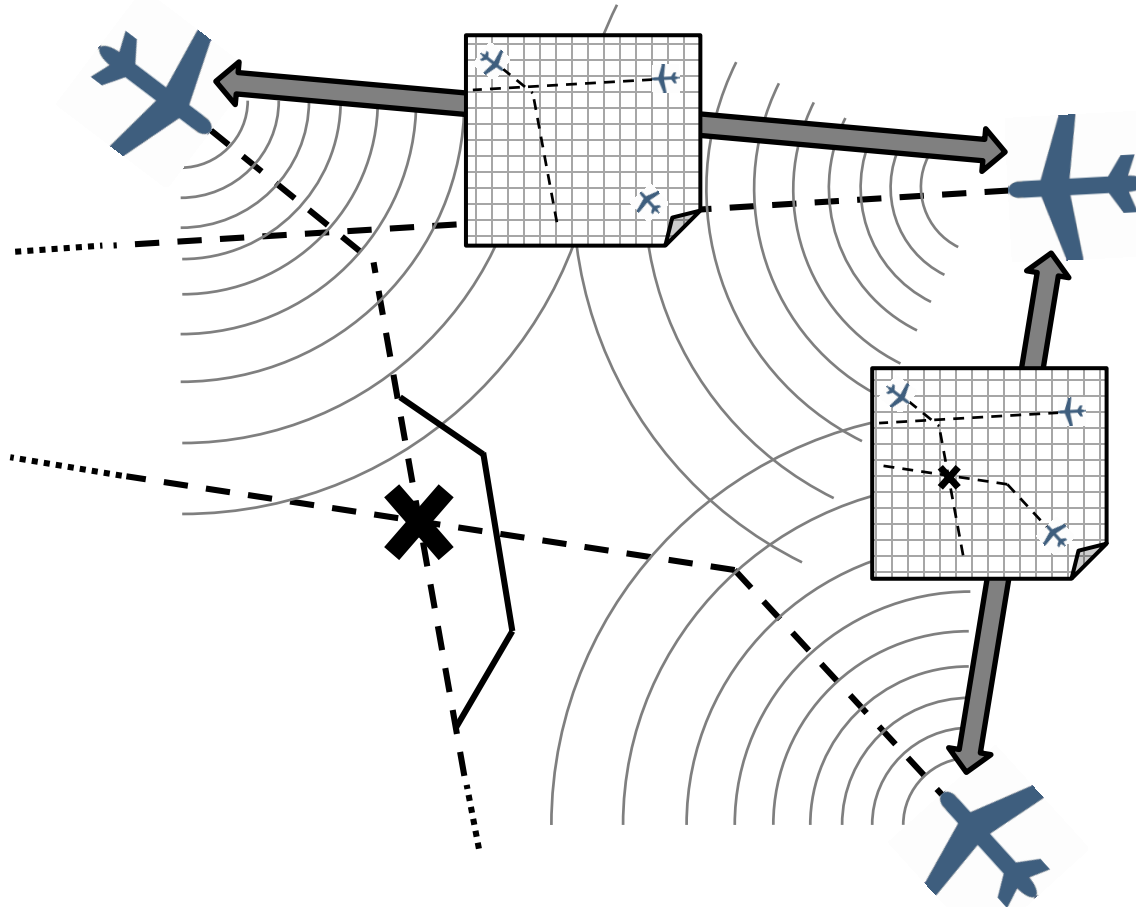
# Model Based Engineering in Industry

- Foster reuse
  - Actual function reuse in multiple systems
  - Reuse of engineering artifacts
  - Seamless engineering
- Foster communication
  - Abstraction
  - Provide much information at a glance
  - Precise descriptions (ambiguity of natural language)
- Foster validation and verification
  - Model checking
  - Inspections etc.

**WHY?**

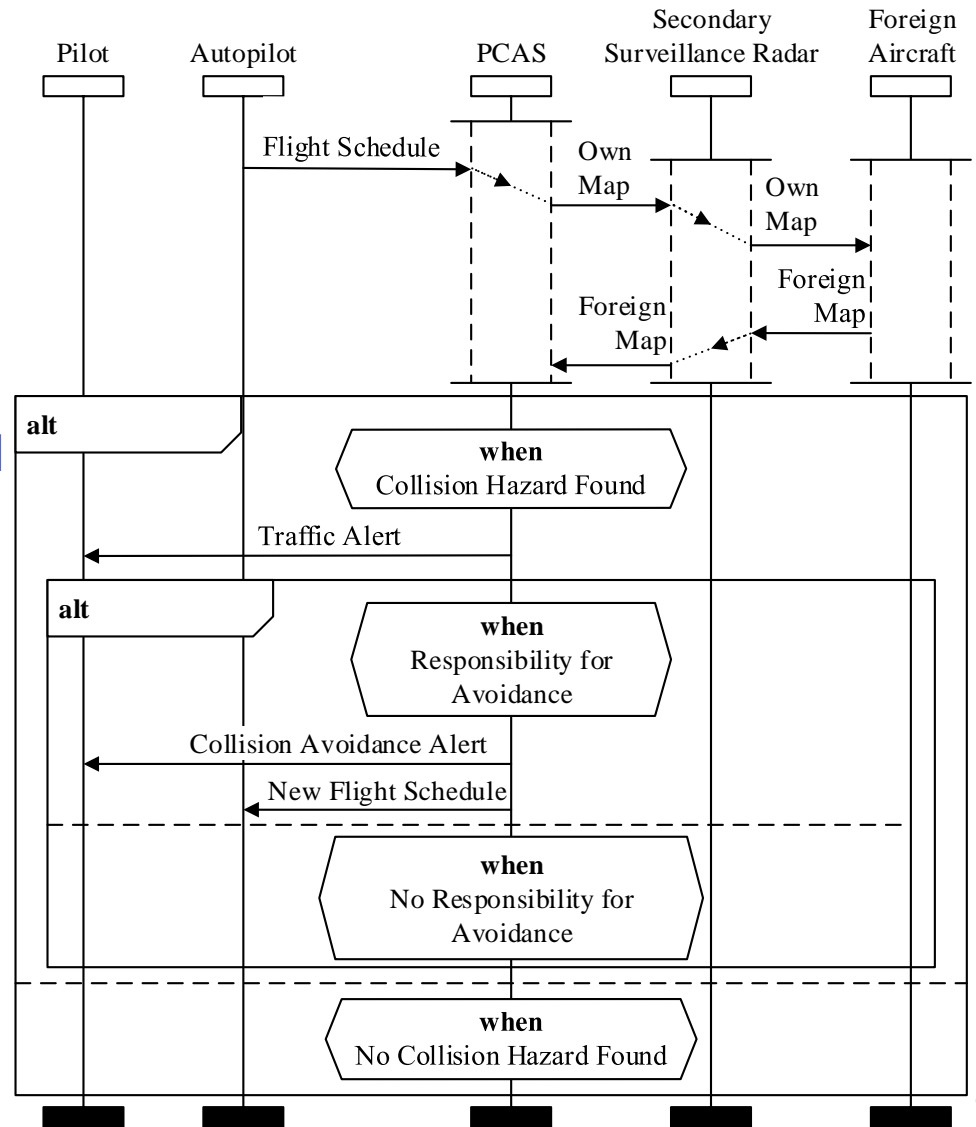
# Industrial Case Study: Proactive Collision Avoidance System

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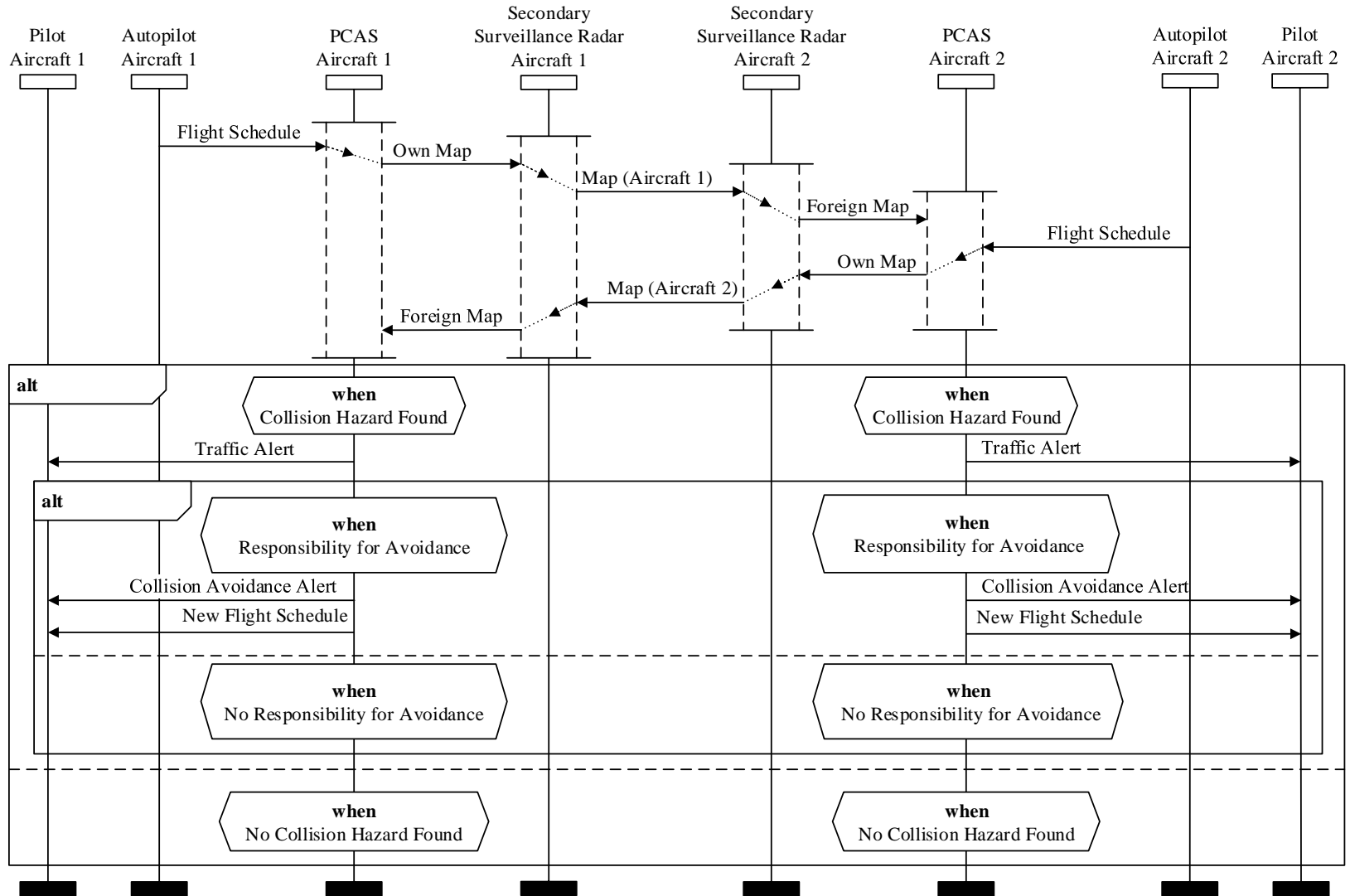


# The Problem

- Collaborating systems create additional functionality in their interplay
- This functionality is neglected when specifying on a type level



# The Problem



# A Basic Solution Idea: Instance Models

- Document and analyze systems on an instance level
- Automated Generation of different instance configurations
- Instance models can serve for automated verification at design time and for monitoring purposes at runtime



# Challenges

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- How many system instances will be collaborating?
- How will they be parametrized?
- Analyzing all potential instance models is not realizable
- Future: Different system types
  - Are different manufacturers involved?
  - Are specifications available?



# Thank You

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