

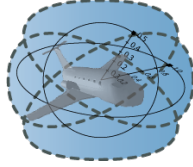
Departamento de Informática

Coalition Diff. Dynamic Logic

Knowledge and Information Systems Group



CENTRIA



LS Lab



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Degrees:

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Objectives

Air France Flight 447 experienced a malfunctioning speed sensor on June 1st 2009. Despite the copilot's attempts at stabilising the plane, the pilot in control's inadequate responses caused Flight 447 to crash into the Atlantic.

There were no survivors.

The objective is to find the means to model and verify the safety of systems like the one in the incident above - cyber-physical systems in which agents (e.g. pilot, copilot) may or may not be acting towards guaranteeing safety.

Methodology

The plan is to develop a logic capable of reasoning over complex systems which consist:

- computation, determining discrete dynamics
- a physical presence, determining continuous dynamics
- agents and coalitions, which may control some variables of the system
- the epistemics of agents, i.e. what they know

To be able to effectively prove important properties, the logic should benefit from usual desirable results such as soundness.

Expected Results

The goal of project is to develop a logic capable of reasoning not only about the plane crash scenario, but more generally about cyberphysical systems that interact with agents in coalitions.

The logic should furthermore be complemented by semi-automatic proof assistants, integrated within existing tools and frameworks.

The theory should be applied to relevant case studies, including the plane crash scenario, self-driving cars, train control systems, etc.

