

Comparative Safety Analysis of Wireless Communication Networks in Avionics

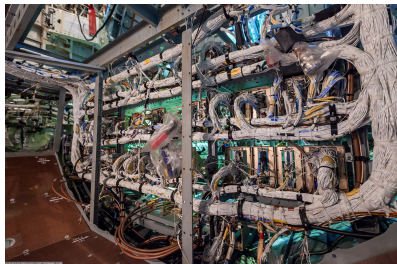
Rohit Dureja and Kristin Yvonne Rozier

Iowa State University



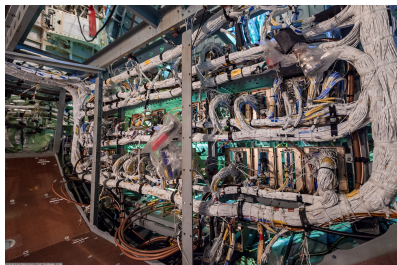
October 5, 2016

- The Airbus A380 has around ~100,000 wires totaling 470 km and weighing 5,700 kg.



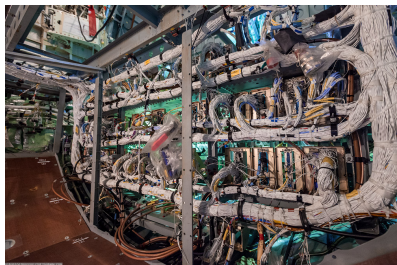
Source: *Catalogue of Catastrophe* - IPLA

- The Airbus A380 has around $\sim 100,000$ wires totaling 470 km and weighing 5,700 kg.
- Reduced weight leads to savings for the airline company, cheaper flights, and improved fleet management.



Source: *Catalogue of Catastrophe* - IPLA

- The Airbus A380 has around $\sim 100,000$ wires totaling 470 km and weighing 5,700 kg.
- Reduced weight leads to savings for the airline company, cheaper flights, and improved fleet management.

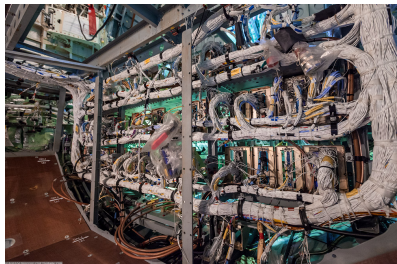


Source: *Catalogue of Catastrophe* - IPLA

First Goal

Reduce wiring so as to decrease aircraft weight by **at least a ton.**

- The Airbus A380 has around $\sim 100,000$ wires totaling 470 km and weighing 5,700 kg.
- Reduced weight leads to savings for the airline company, cheaper flights, and improved fleet management.



Source: *Catalogue of Catastrophe* - IPLA

First Goal

Reduce wiring so as to decrease aircraft weight by **at least a ton**.

Second Goal

The wireless network needs to be at least as reliable and fault tolerant as the existing wired network.

The problem of migrating communication technology in terms of system safety is addressed.

The problem of migrating communication technology in terms of system safety is addressed.

The proposed formal framework aids system designers to compare different communication networks simultaneously, and explore viable fault tolerant mechanisms.

The problem of migrating communication technology in terms of system safety is addressed.

The proposed formal framework aids system designers to compare different communication networks simultaneously, and explore viable fault tolerant mechanisms.

The framework builds upon existing model checking and safety assessment tools, and is plug-and-play.