

New system will improve interaction between autopilots and pilots

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A prototype flight computer has been designed and evaluated which will improve the interaction between an aircraft's autopilot and pilot.

Although autopilots and pilots individually seldom make mistakes, on rare occasions errors are made due to inefficient collaboration between the two. Usually this results in nothing more than a moment of confusion. Occasionally (albeit rarely) it leads to an accident.

Professor Peter Johnson and Rachid Hourizi at the University of Bath have used funding from the Engineering and Physical Sciences Research Council to test their theory that these misunderstandings are due to the restricted interaction and low-level communication style of the autopilot rather than human error on the part of the pilot.

In the current generation of computerised cockpits, the autopilot tells the pilot what the immediate action being undertaken is (e.g. 'the plane is flying at 10,000 feet'). The more explicit details (i.e. what action is going to be taken next and the objective of a particular manoeuvre) are calculated by the pilot.

This new system's software interface gives the autopilot more of the calculation work to do. This makes the interaction between the autopilot and pilot more explicit. This in turn reduces the chance of mistakes being made. It also frees up more time for the pilot to monitor situations. The pilot continues to look after the high level decisions such as ensuring the plane is on course.

"The interface is based on the communication procedures used in a number of safety critical domains from fire fighting to military operations where the current situation, action to be taken and objectives are explicitly stated," said Rachid Hourizi. "Our new system brings the interaction between the autopilot and pilot onto a more robust level."

The researchers have presented their results to companies and organisations such as Airbus, Qinetiq and BAE Systems. As a result they have attracted a number of follow-on contracts from industry to help bring these ideas to fruition inside modern cockpits. This research could be incorporated into active autopilots within a decade.

Source: Engineering and Physical Sciences Research Council

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