Robotic co-pilot is shown to land simulated Boeing 737

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(Tech Xplore)—Would you want to take your next flight out knowing the pilot is a robot? The question will not be a problem for you to resolve any time soon. Instead, consider a robot behaving as co-pilot and that is

not just a thought; it has been tested for real.

The news is that a robotic co-pilot showed its capability to fly and land a simulated Boeing 737.

Aurora Flight Sciences is the aerospace company involved in this show, as part of DARPA's ALIAS program.

Headquartered in Manassas, Virginia, the company has a number of R&D centers including one in Cambridge, MA.

ALIAS stands for the Aircrew Labor In-Cockpit Automation System program, and it is from Defense Advanced Research Projects Agency (DARPA). They want, among other goals, to enable operation with reduced onboard crew.

Scott Wierzbanowski joined DARPA in November 2016 as a program manager in the Tactical Technology Office. He wrote about Aircrew Labor In-Cockpit Automation System (ALIAS) on DARPA site

"ALIAS envisions a tailorable, drop-in, removable kit that would promote the addition of high levels of automation into existing aircraft, enabling operation with reduced onboard crew."

Rather than setting out with a mission to boot human pilots off the plane, ALIAS is a program to help reduce pilot workload, augment performance and improve safety.

"The military will often find themselves in stressful situations," said *Sputnik*, and are keen to use systems that have the potential to interact with the crew; it is for this reason that the use of robots in the cockpit is becoming a highly likely option."

With DARPA's ALIAS program, *Sputnik* said, "the military have evolved to incorporate automated capabilities, improving mission safety and success rates."

Aurora Flight Sciences, meantime, is not your typical aerospace company, as they point out. They are involved in the development and manufacturing of advanced unmanned systems and aerospace vehicles. They state a commitment to the science of autonomous flight.

Quite simply, the robot was able to occupy the role of co-pilot and land the plane. A video was posted on May 16 which shows the operations it carried out. The demonstration was on a Boeing 737-800NG simulator, at the John A. Volpe National Transportation Systems Center, Cambridge, Massachusetts.

ALIAS makes use of in-cockpit machine vision, robotic components to actuate the flight controls, an advanced tablet-based user interface, speech recognition and synthesis, and a knowledge acquisition process. The latter facilitates transition of the automation system to another aircraft within a 30-day period.

The company points out in its list of system features: "Ability to learn aircraft procedures and visually gather information without requiring access to aircraft avionics."

Much has been said about the ALIAS interface in playing a co-pilot role.

Jessica Duda, Humans and Autonomy Group Lead at Aurora Flight Sciences, was quoted in *Digital Trends*. "ALIAS as a whole is much more capable than an autopilot, as it includes procedures tracking and monitoring, contingency identification and response, and intelligent interaction with the onboard pilot."

Sputnik said, "the machine is able to control the advanced tablet-based user interface and works off speech recognition."

In the video, you can see the robot performing a number of tasks involved to bring the plane to landing.

Why This Matters: "Aurora's done this before in an actual flight, but for light aircraft," said *Sputnik*. "Simulating a 737 landing gets it closer to ALIAS' goal of adding a helping hand to crews of large military aircraft and potentially even using robots in passenger planes."

More information: www.aurora.aero/wp-content/upl … -737-Simulator-1.pdf

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