U-2S Dragon Lady : The Electronic Pilot

(Photo: Keith Heywood)

On 15 December 2020, Artificial Intelligence (AI) driven algorithms controlled sensor and navigation systems on a United States Air Force (USAF) Lockheed Martin U-2S Dragon Lady Reconnaissance aircraft in a flight test. The service says that this is the first time that artificial intelligence has been "safely" put in charge of any United States military system and appears to be the first time it has been publicly utilised on a military aircraft. The test, involved a U-2S from the 9th Reconnaissance Wing at Beale Air Force Base in California.

The Air Force has dubbed the AI software package as ARTUμ, in reference to the iconic droid from the Star Wars universe, who serves as a sort of robotic flight engineer and navigator. "ARTUμ's ground breaking flight culminates our three-year journey to becoming a digital force," Assistant Air Force Secretary Will Roper said in a statement. "Putting AI safely in command of a US military system for the first time ushers in a new age of human-machine teaming and algorithmic competition. Failing to realise AI's full potential will mean ceding decision advantage to our adversaries." "Call sign 'Artuμ,' we modified world-leading μZero gaming algorithms to operate the U-2›s radar,» Roper wrote in his tweet about the test. «This first AI co-pilot even served as mission commander on its seminal training flight!»

The μZero algorithm, developed by AI Research Company 'DeepMind' has been used by computers to play chess, Go, and video games in the past, "without prior knowledge of their rules," Roper further explained in a piece he wrote for Popular Mechanics about this test. The U-2 Federal Laboratory helped integrate the modified ARTUμ version of this software package onto the U-2S reconnaissance platform. And it is enabled by a publicly available, Google-developed system called Kubernetes, which allows the AI software to be ported between the plane's on-board computer systems and the cloud-based one it was developed on.

In Popular Mechanics, Roper described the flight test as follows: "Our demo flew a reconnaissance mission during a simulated missile strike at Beale Air Force Base. ARTUμ searched for enemy launchers while our pilot (call sign "Vudu") searched for threatening aircraft, both sharing the U-2's radar. With no pilot override, ARTUμ made final calls on devoting the radar to missile hunting versus self-protection. Luke Skywalker certainly never took such orders from his X-Wing sidekick!"

"Like a breaker box for code, the U-2 gave ARTUμ complete radar control while 'switching off' access to other subsystems. Had the scenario been navigating an asteroid field—or more likely field of enemy radars—those 'on-off' switches could adjust. The design allows operators to choose what AI won't do to accept the operational risk of what it will. Creating this software breaker box—instead of Pandora's, has been an Air Force journey of more than a few parsecs". Roper said the AI was trained against an opposing computer to look for oncoming missiles and missile launchers. For the purposes of the initial test flight, the AI got the final vote on where to direct the plane's sensors.

The radar referred to is likely to be the latest iterations of the Advanced Synthetic