Wayne's World: Autonomy in Australia

Cobot works alongside humans

BY GEORGINA RAMIN, BOEING WRITER

When "Wayne" enters the room, people take notice.

A rhythmic beeping and flashing orange light signal the entrance of this autonomous mobile collaborative robot – known as a cobot.

A welcome sight at Boeing's 787 Dreamliner production area in Melbourne, Australia, Wayne works on the shop floor together with human teammates. The cobot carries out tasks that previously caused repetitive strain injuries.



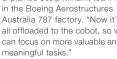
ROBOT AT THE READ

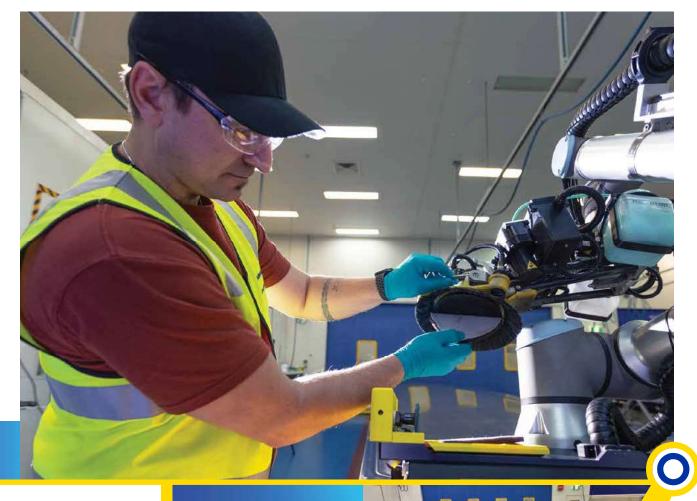
Wayne waits to pick up where Boeing Australia 787 technicia Joe Cascun leaves off.

PHOTO: WOODROW WILSON/BOEI

Australia is the first Boeing site to use such technology. Since its introduction two years ago, workplace injuries in the 787 area have significantly decreased. While other safety measures were also put in place during that time, the team believes Wayne played a significant role in getting the numbers down.

"Getting the 787 wing tools or mandrels ready for manufacturing in the tool preparation area was important but repetitive work," explained Josip Mihalik, team lead in the Boeing Aerostructures Australia 787 factory. "Now it's all offloaded to the cobot, so we can focus on more valuable and meaningful tasks."





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JOSIP MIHALIK **BOEING AEROSTRUCTURES AUSTRALIA**

SAND MAN

Technician Josip Mihalik replaces a sanding pad on Wayne's end-effector.

COBOT COLLAB





Wayne's primary role is to sand, clean and prepare layup mandrels that are used to produce 787 components









Wayne's **World: Autonomy** in Australia

Mihalik and his colleagues are reaping the benefits of Boeing's investment in R&D. Boeing Australia teammates have been coding the blueprint for safe and trusted artificial intelligence (AI) and autonomous behaviours in uncrewed aircraft and robotics.

Boeing Research & Technology (BR&T) aerospace engineers in Australia designed and engineered the autonomy built into many of Boeing's cobots. These teams are pushing the limits of what can be achieved in a complex factory environment.

You can find Wayne self-navigating around the 787 factory, avoiding people and obstacles, and using its handy mechanical arm to carry out sanding and cleaning along with manufacturing staff. The teams plan to implement a second cobot for 737 production.

Boeing Australia has long been a test bed of innovation for autonomous technology for The Boeing Company, thanks to a unique partnership between BR&T Australia and Phantom Works Global.





SCAN ScanEagle intel here.



EXPLORE





MQ-28 Ghost Bat

The Boeing Airpower Teaming System created the first military aircraft designed, developed and manufactured in Australia in half a century. The MQ-28 is an uncrewed aircraft made to work as a smart team with other military aircraft to expand and extend airborne mission capabilities.



ScanEagle

Insitu Pacific's ScanEagle detect and avoid software enhances safe airspace integration of uncrewed aircraft systems (UAS).

Machine-learning software

Phantom Works Global's uncrewed technology teaches UAS to detect, decide and act during missions.









"Continued investment by Boeing in the region, strong government support and safety-focused regulators make Australia the perfect testing environment for new commercial and defence products," said Michael Edwards, director of BR&T – Asia Pacific.

The critical Al knowledge and coding skills required to develop autonomous behaviours and navigation are key factors in Boeing Australia's success. For example, the "brain" on board the mission system of Boeing's smaller test assets, the MQ-28 Ghost Bat and cobots like Wayne each have unique software that automates different tasks.

Phantom Works Global, the defence rapid-prototyping arm of Boeing Australia, tested autonomous behaviours in the early phases of the Airpower Teaming System (now known as MQ-28 Ghost Bat) and is expanding into multiple domains.

"Our focus is on creating systems that team together to work as one across air, land, sea and space," said Emily Hughes, director of Phantom Works Global.

SCREEN TEAM

Machine learning specialist Dr. Zee Jan

"We are refining our work in autonomy and AI to provide new autonomous teaming solutions to the Australian Defence Force."

From cobots like Wayne that reduce workplace injuries to uncrewed systems protecting Australia's national interests, humans are quickly learning — as fast as the machines they make — how important these technologies are to create opportunities and confront future challenges. IQ

Not subject to U.S. Export Administration Regulations (EAR) (15 C.F.R. Parts 730-774) or U.S. International Traffic in Arms Regulations (ITAR) (22 C.F.R. Parts 120-130).

MEET

the MQ-28 Ghost Bat team and go behind the scenes (aircraft previously known as Loyal Wingman).





HOTO: PAUL SARGAISON/BRISBANE HEADSHOTS

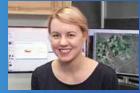


PHOTO: BRUCE GIBSON/BO



PHOTO: SIMO

Meet Australia's Autonomous Tech Experts

Nathan Bick

Operations analyst, Phantom Works Global

Expert in using modelling and simulation to facilitate the process of making complex decisions.

"Working on autonomous technology and pushing the boundaries of what's possible is a fantastic experience. Our team focuses on collaboration to overcome challenges and deliver a system that successfully blends human ingenuity with the capabilities of the machines the humans themselves built. This technology increases our safety and supports our future."

IQ Robot

Natasha Moffat

Senior software engineer, Insitu Pacific

Leads autonomous software development to help safely integrate UAS into complex airspace.

"I love working in autonomy because everything has so much potential, the work always feels worthwhile, and nothing beats being able to flight test your work."

William Ko

Automation research engineer, BR&T Australia

Designs and develops advanced robotic systems that enhance safety, quality and efficiency of aerospace production systems.

"At BR&T, we push the boundaries of technology, building robotic systems you cannot find anywhere else in the world. It is deeply satisfying to solve a huge range of problems unique to aerospace side by side with engineers who are the best in their fields."