

US and UK research labs collaborate on autonomy and AI

The Air Force Research Laboratory (AFRL), in partnership with the UK's Defence Science and Technology Laboratory (Dstl), have demonstrated for the first time the ability for the US and the UK to jointly develop, select, train, and deploy state-of-the-art machine learning algorithms in support of the armed forces of each of the 2 nations.

This research is designed to support adjacent collaborating US and UK brigades with enduring wide-area situational awareness. It aims to improve decision-making, increase operational tempo, reduce risk to life, and reduce manpower burden.

The dual in-person and virtual demonstration was hosted jointly at AFRL's Information Directorate in Rome, New York, and at Dstl's site near Salisbury on 18 October 2021. The demonstration highlighted integrated artificial intelligence (AI) technologies across the 2 nations, showcasing the ability to share data and algorithms through a common development and deployment platform to enable the rapid selection, testing, and deployment of artificial intelligence capabilities.

The event was made possible by a UK and US Partnership Agreement concerning autonomy and artificial intelligence collaboration, established in December 2020. This was the first of a rotational series of events to be hosted by the joint and international signatories of the Autonomy and Artificial Intelligence Collaboration (AAIC) Partnership Agreement.

Leadership participants from both the US and the UK attended in person, with virtual participation by attendees from all services and the United States Office of the Under Secretary of Defense for Research and Engineering (OUSDRE).

The AAIC Partnership Agreement effort is led by the United States Department of the Air Force (with AFRL as the lead agency for the US Air Force) in partnership with OUSDRE, the US Navy and Army, and the UK's Dstl.

Dr Robert W Sadowski, US Army DEVCOM, said:

We are dedicated to getting robotics and autonomous systems capability into the hands of the warfighters.

Advances in robotics and autonomy will make our formations more capable and mission-ready while providing protection to our warfighters through unprecedented stand-off while enabling enhanced lethality on the battlefield.

The 4-year partnership agreement includes objectives to accelerate joint

UK/US development and sharing of AI technology and capabilities. It spans from foundational research in test verification and validation, to AI algorithm research and development, to joint experiments advancing the joint all-domain command and control capabilities of both nations.

Dr Lee M Seversky, AFRL lead for the demonstration and the US Project Agreement, said:

The October 18 event demonstrated how the UK and US can integrate AI technology to create the first end-to-end machine learning research, development, and deployment ecosystem, enabling rapid data sharing, algorithm development, evaluation, and deployment.

AI will play a critical role in accelerating decision making to meet the pace and scale of the future battlespace.

During the demonstration, the simulated scenario focused on how the UK and US can cooperate and share AI capabilities to support the 'close' fight. Where both countries operate in adjacent areas, they are able to share data, AI algorithms and capability tightly during mission execution.

The demonstration brought together key technologies from both nations. The UK's Model Cards are able to present to a commander the ability to quickly understand, explore, and select appropriate machine learning (ML) models to deploy in mission. The US StreamlinedML is a government-owned, extensible open platform to quickly build ML workflows, train and evaluate ML models, and deploy them regardless of the source or ML software stack use – taking advantage of the best of breed ML technology spanning commercial, academia and government.

Dstl's Todd Robinson heads up the UK element to the project, and said:

This collaboration with AFRL and the US services is crucial to drive the very latest AI technology into military operations and innovative research in both nations.

The demonstration is just the first step toward our ambition of deploying novel AI that can learn in the field into an experimental trial environment, something that hasn't been done before and is only possible due to this collaboration.

The demonstration successfully showed the integration of 15 state-of-the-art machine learning algorithms, 12 UK and US datasets, 5 automated ML workflows for training and retraining models based on mission needs, and the ability deploy the models as a service to target end users and platforms.

This is the first of a series of joint technical and operation experiments planned under the 4 year partnership agreement.