

xTechGlobal Artificial Intelligence (AI) Challenge

Background Information

The US Army, in partnership with US Air Force and US Navy, is announcing its first international tri-service competition, xTechGlobal Artificial Intelligence (AI) Challenge. The xTechGlobal AI Challenge aims to engage with eligible international small to medium enterprises in the US Army Combat Capabilities Development Command (DEVCOM) Atlantic Area of Responsibility (AOR), including Europe, the Middle East and Africa (EMEA), across the broad spectrum of science and technology to identify capabilities that provide robust, AI-enabled capabilities to manage, integrate, and process disparate data/information sources for rapid decision making.

The US Army Futures Command (AFC)-DEVCOM Atlantic has partnered with Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)), the US Air Force's AFWERX program and the US Navy Office of Naval Research-Global (ONR-G) to deliver this tri-service competition to an international audience for the first time. The services recognize that the US Department of Defense (DoD) must enhance engagements with eligible international small to medium enterprises, by: (1) understanding the spectrum of 'world-class' technologies being developed commercially that may benefit the DoD; (2) integrating the sector of small business innovators into the DoD Science and Technology (S&T) ecosystem; and (3) providing mentorship and expertise to accelerate, mature, and transition technologies of interest to the DoD.

Why Should I Apply?

The Army xTechGlobal AI Challenge is an opportunity for eligible international small to medium enterprises to pitch their novel, dual-use technology solutions directly to the US DoD. The challenge will consist of a two-round competition: (1) call for concept white papers and (2) finalists pitch event. Up to (10) finalists will receive an award of \$10,000 each and be invited to pitch their technologies during the pitch event at the Innovation Hub (I-HUB) Imperial College London (ICL) tentatively scheduled for early September 2021 (travel restrictions permitting). The option to pitch virtually will be offered to finalists who are not able to travel, either due to personal reasons or country restrictions. Up to three winners will be selected from the pitch event and awarded an additional prize of up to \$70,000. Details on the prize structure are listed below in this announcement. In addition to non-dilutive cash prizes, businesses will have the opportunity to engage with US DoD and other international partners through information sharing and networking opportunities.

The efforts described in this notice are being pursued under the authorities of 10 United States Code (USC) §2374a. While the authority of this program is 10 USC §2374a, a concept white paper submitted to the xTechGlobal AI Challenge may generate interest by another DoD organization for a funding opportunity outside of this program (e.g., submission of a proposal under a Broad Agency Announcement). The interested DoD organization may contact the participant to provide additional information or ask for a request for proposal in a separate solicitation.

The crosscutting topic areas contained in this AI Challenge are important across the US DoD. Collaborators from US Army Artificial Intelligence Task Force, DEVCOM Army Research Laboratory, US Army 75th Innovation Command, US Air Force Office of Scientific Research (AFOSR), and ONR-G were involved in the competition planning and topic

curation. Given the global mission of DEVCOM, a key aspect of this challenge will be increasing interoperability with our foreign partners. DoD will leverage international partners at the I-HUB, including UK Ministry of Defense (MOD) and UK Defence and Security Accelerator (DASA) to further the exposure and networking opportunities provided to selected participants in this contest.

xTechGlobal strives to integrate these eligible international small to medium enterprises into the US Army's S&T ecosystem and will provide operational and technical feedback from Army subject matter experts, and offer the finalists opportunities to participate in the xTech Accelerator and receive education, mentorship, and networking opportunities to help grow their companies for military and commercial users.

Problem Statement:

Topic: AI-enabled Multi-modal Analytics in Resource Constrained Environments

Challenge: Our world is facing a rapid proliferation of data—with more and more data generated from an ever-growing number of data sources. With all of this data comes the promise of better, faster decision making but only if we can properly collect, process, interpret and present that data to those making decisions. The DoD is seeking robust, AI-enabled capabilities to manage, integrate, and process, and reason on disparate data/information sources for rapid decision making. This is particularly challenging due to severe constraints of resources such as computing power and bandwidth at the point of need. Of particular interest are the following AI/Machine Learning (ML) algorithms and software tools to enable data analytic capabilities in resource-constrained environments:

- AI-enabled algorithms and services to rapidly assess availability of data and information sources and match the most relevant sources to end users based on user needs and available resources.
- Multi-modal reinforcement learning algorithms and AI-enabled analytic software tools for disparate data types (e.g., video, over-the-air signals, passive sensor data, and open-source multimedia)

Military Narrative: Future US and coalition forces will employ intelligence, surveillance and reconnaissance (ISR) sensors and intelligent agents (software and robotics) to independently and collectively conduct a wide range of distributed operations in complex, multi-domain environments.¹ Warfighters at the tactical edge do not have large computing capability and are bandwidth constrained. This significantly impacts capability, user workload and utility of ISR at the edge of need. AI has the potential to improve information effectiveness and reduce workload at machine speed if AI/ML techniques are optimized for the constrained tactical environment. Furthermore, warfighters do not have the time or cognitive ability to sift through data in an information-soaked environment. As more and more urban areas become “smart cities.” the available information increases exponentially. For instance, a Soldier on patrol cannot scan every street camera, view every sensor's data, or determine social media sentiment.^{2,3}

¹ T. Pham et al., “Prevailing in a Complex World: ARL's Essential Research Area in AI & ML,” NATO IST-160 Specialists' Meeting on Big Data & AI for Military Decision Making, May 2018.

² S. Toth et al., “The journey to collaborative AI at the tactical edge,” SPIE DCS Conference on Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications III, Apr 2021.

³ E. Blasch et al., “Machine Learning/Artificial Intelligence for Sensor Data Fusion-opportunities and challenges,” (in publication) IEEE Aerospace & Electronic Systems Magazine, 2021.

We are looking for AI/ML solutions that might include or enable any of the following:

- Bandwidth Constrained Computing: Quantum/5G/Edge/Onboard/Cloud
- Sensor/Data Fusion
- Predictive/Anticipatory Data Analytics
- Extending human cognitive ability for decision making in information soaked environments
- Manage/integrate/process disparate data sources at speed

Eligibility Requirements:

The entities allowed to participate in this competition must be international small to medium enterprise (SME) businesses from the DEVCOM Atlantic AOR; including Europe, the Middle East and Africa (EMEA). SME business are defined as those with <250 staff headcount, and within turn-over thresholds per the European Commission (EC) definition of SME⁴. Participating entities must have or be able to obtain a CAGE code if selected to advance in the competition. Instructions on how to obtain a CAGE code can be found on the xTechGlobal registration page.

Each eligible entity

- Shall be incorporated in, and maintain, a primary place of business in a country in EMEA.
- May not be a US Federal or foreign government entity or employ a US Federal employee acting within the scope of their employment.

The prize challenge will be used to identify small business concerns that meet the criteria for award of a follow on contract for additional proof-of-concept or prototype development. Finalists of the prize competition may be invited to submit a proposal for further development of their proposed technology innovation. There is potential for award of (1) cooperative agreement (CA) for a follow-on project with Army Research Laboratory to the winners of the competition. The winners of the prize competition will be invited to submit proposals for the CA opportunity. xTechGlobal is not guaranteeing the CA award and will not pay funding for the development of the proposal. The efforts described in this Notice are being pursued under the authorities of 10 USC 2374a.

While the authority of this program is 10 USC §2374a, a concept white paper submitted to the xTechGlobal AI Challenge may generate interest by another DoD organization for a funding opportunity outside of this program. The interested DoD organization may contact the participant to provide additional information.

Program Submission:

The xTechGlobal AI Challenge is voluntary and open to all entities that meet the eligibility requirements. **There may be only one submission per eligible entity and all submissions must be submitted in English.** The registration information and upload submission must be received by **13:00 GMT on 12 May 2021**. Submissions received after the deadline will not be considered.

⁴ https://ec.europa.eu/growth/smes/sme-definition_en

Register now by selecting the xTech|Global AI Challenge tile at:

<https://www.xtechsearch.army.mil/>

All xTechGlobal AI Challenge submissions are treated as privileged information and contents are disclosed to US and International defense civilian and military employees who are part of their host-nation's Ministry/Department of Defense (MOD/DOD) or designated support contractors only for the purpose of evaluation and program support.

Part 1: Concept White Paper

All eligible entities shall submit a concept white paper and an accompanying single-slide summary chart outlining their technology, the potential impact on the US military, the scientific viability of their approach, and the dual-use technology applications for both the commercial and defense space, and submission quality. Each concept white paper and accompanying single-slide summary chart will be reviewed by DoD and international stakeholders including user, program acquisition, and research and development subject matter experts.

All concept white papers and single-slide summary charts must adhere to the following requirements:

- All concept white papers must be submitted using the template found on the registration page, "*xTechGlobal_AI_Challenge_WhitePaper_Template.doc*". **Any proposals submitted in a format other than that provided by the template will not be reviewed.**
- All quad charts must be submitted using the template found on the registration page, "*xTechGlobal_AI_Challenge_SummaryChart_Template.ppt*". **Any single-slide summary charts submitted in a format other than that provided by the template will not be reviewed.**
- Please list your company name, and proposal title EXACTLY how you would like them to appear on any contest marketing materials. Use clear and concise proposal titles to give readers and potential stakeholders an understanding of how your technology would benefit the Army.

Concept white papers and accompanying single-slide summary charts will be evaluated and ranked using the following scoring criteria (further details on each scoring dimension can be found on the xTechGlobal AI Challenge registration page):

- Summary Chart – 10%
- Technology Concept and Viability – 30%
- Potential for Impact/Revolutionizing the Army – 30%
- Commercial Potential – 20%
- Submission Quality – 10%

Upon conclusion of the Concept white paper evaluation period, the Government will select

up to ten (10) participants to receive a prize award of \$10,000 each and an invitation to Part 2: Final Technology Pitches, tentatively scheduled for early September 2021.

Part 2: Final Technology Pitches

In Part 2, the selected participants will conduct a pitch (live in-person or virtual) to a panel of DoD and international subject matter experts at the pitch event tentatively scheduled early September 2021 (dates will be finalized with participants). Participants will pitch their technology concept and team ability to a representative DoD and international panel from the AI eco-system representing user, program acquisition, and research and development subject matter experts. Each participant will have 20 minutes to pitch, followed by 10 minutes for questions and answers with the judges' panel. The option to pitch virtually will be offered to finalists who are not able to travel, either due to personal reasons or country restrictions.

Detailed instructions and evaluation criteria will be provided to the finalists. The top three (3) participants will be selected by the panel and awarded an additional prize as described below.

The finalists will also receive personal mentoring from the xTech Accelerator program, a US innovation accelerator, to learn how to leverage the DoD defense market for future partnership opportunities. Finalists will receive intensive mentorship and access to networking events to help grow their companies for DoD and commercial users.

Detailed feedback from the Technology Pitch panel will be provided to the participants of the technology pitch phase. The purpose of providing this feedback is to help accelerate transition of the technology to a US military end-user by providing insight on best applications for the technology within the US military, suggestions for product improvement for military use, and recommended next steps for development. However, the Government will not respond to questions or inquiries regarding this feedback.

In conjunction with the pitch event, UK DASA will be hosting UK Venture Capitalists (VC) at the venue who are looking to invest in the AI technology area. Finalists will receive DASA support toward an opportunity to discuss their company and technology with the VCs.

Prizes and Incentives

Prizes will be offered under 10 USC §2374a (Prize competitions). The current prize pool is \$250,000 and will be finalized at the close of the announcement.

Other non-monetary incentives are provided through the xTechGlobal AI Challenge to help international small businesses engage and stay engaged with the Army.

<i>Phase</i>	<i>Number of Winners</i>	<i>Prize</i>
Application Part 1: Concept White Paper	Up to 10	\$10,000
Finals	Up to 3	1 st Place: \$70,000; 2 nd Place:\$50,000; 3 rd Place: \$30,000
	Total	\$250,000

Proposed Schedule (Subject to Adjustments):

Date	Activity
25 March – 12 May 2021	Application Part 1: Concept white paper submission period
1 July 2021	Finalists announced
Early September 2021	Finalists pitch at I-HUB Imperial College London, UK
Early September 2021	Winners announced

Disclaimers

Registered participants shall be required to assume any and all risks and waive claims against the Federal Government and its related entities, except in the case of willful misconduct, for any injury, death, damage, or loss of property, revenue, or profits, whether direct, indirect, or consequential, arising from their participation in this prize competition, whether the injury, death, damage, or loss arises through negligence or otherwise.

Intellectual Property

The Army is a strong proponent of deliberate intellectual property (IP) rights and management by the private sector and the DoD.

For the xTechGlobal AI Challenge:

- The Federal Government may not gain an interest in IP developed by a participant without the written consent of the participant;
- Nothing in this xTechGlobal prize competition shall diminish the Government's rights in patents, technical data, technical information, computer software, computer databases, and computer software documentation that the Government had prior to this xTechGlobal prize competition, or is entitled to, under any other Government agreement or contract, or is otherwise entitled to under law; and
- The Federal Government may negotiate a license for the use of IP developed by a registered participant in the prize competition.

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<https://www.xtechsearch.army.mil/>

Point of Contact

The xTech Program Office

Office of the Deputy Assistant Secretary of the Army, Research and Technology

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