HMGCC Co-Creation

Surveillance challenge using edge AI

Summary of the challenge

Surveillance cameras are vital tools for use in national security, but they are often battery powered, power-hungry and run for a long time to capture the right footage.

In this challenge, HMGCC Co-Creation wants to hear from organisations capable of enabling visual surveillance systems to operate with less power – using edge AI. This challenge is based around the idea that edge AI, which deploys AI algorithms directly onto devices, could help intelligently reduce the power needed by enabling use of trigger sensors.

Organisations are being asked to apply if, over a 12-week period, they can develop and demonstrate technology to meet this challenge. HMGCC Co-Creation will provide funding for time, materials, overheads and other indirect expenses.

Key information

Budget per single organisation, up to	**£60,000**
Project duration	**12 weeks**
Competition opens	**Monday 28 April 2025**
Competition closes	**Thursday 29 May 2025 at 5:00pm**

Context of the challenge

Visual surveillance is a common technique for law enforcement, national security and military organisations. In dynamic operational scenarios, there is rarely the opportunity to use mains power, so battery power is often the method used.

A surveillance system typically comprises a high quality and power-hungry visual camera, a battery and a communication system to stream or send back images to a central location.

Surveillance can be a necessary tool in many types of situations and locations, for example urban or remote places, or in hostile environments.

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The gap

One common way of cutting power use in surveillance systems is by using trigger sensors, such as passive infrared (PIR) sensors. Examples are seen in video doorbells. This means the visual sensor, which uses significant power, is only triggered when something needs to be recorded. However, they are prone to being falsely triggered, and effectiveness can reduce in low light conditions.

By incorporating intelligence into a surveillance system, there is an opportunity to use alternative sensors such as audio, radar, low power visual, etc, to only trigger when very specific events occur such as a particular vehicle or person comes into view.

Example use case

Lucy is the chief investigator for two related surveillance operations – one in a rural barn and one in an urban area. These are both linked by the activities of a criminal gang thought to be manufacturing illicit drugs. Lucy's operation is now at the position where she wants to record activities of the lab operators, using visual surveillance, without raising suspicion.

She wants to use a high quality but power-hungry camera. She usually couples this with passive infrared (PIR) sensors so the camera only switches on when movement is detected. However, particularly in the urban environment, the PIR will falsely trigger, reducing battery life and, consequently, operation deployment time.

Lucy decides to deploy some newly acquired technology. She uses her normal camera, battery and communication system, but connects an off-the- shelf low power camera coupled with an edge AI device.

The low power camera is not good enough to accurately identify a person and cannot be used for evidential purposes in court. But the edge device is programmed to use the feed from the low power camera and recognise a subject of interest (SOI). It can then send a message to Lucy as well as turning power on to the camera for images to be captured and sleeps when the SOI (the trigger) is out of view.

With the new device, more than 99% of the visual imagery taken is filtered out and only the crucial information is sent back to Lucy. Not only does this save battery power, but it also saves the time taken to review footage.

Project scope

In this 12-week project, applicants should aim to deliver a demonstration showing the enhanced capabilities of existing surveillance systems by providing separate edge

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analytics modules. This could focus on the analytical software, power efficient edge AI hardware, multi-modal sensors or a systems approach. Organisers of this challenge are particularly interested in edge AI / ML technology, however this challenge is open to other non-AI solutions.

This is open to Technology Readiness Levels (TRL) from 4 – 9. It is recommended that in proposals label both the existing TRL and TRL that would be expected by the end of 12 weeks. This challenge encourages commercialisation by bringing a new or refined product or service to market to which you have the IP to exploit.

Essential requirements:

- Project focus on low-power edge devices.
- Minimised power consumption is crucial.
- Ability to plug and play into existing surveillance systems.
- Consider secure by design. Intelligence on the edge device must be protected against compromise.
- Receive a demonstrator as the final deliverable.

Not required:

- Horizon scanning only.

Consider using existing object detection training datasets, as sharing of data from HMGCC Co-Creation is unlikely.

Dates

Competition opens	Monday 28 April 2025
Clarifying questions deadline	Tuesday 13 May 2025
Clarifying questions published	Friday 16 May 2025
Competition closes	Thursday 29 May 2025 at 5:00pm
Applicant notified	Wednesday 11 June 2025
Pitch day in Milton Keynes	Tuesday 17 June 2025

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Pitch Day outcome	Wednesday 18 June 2025
Commercial onboarding begins*	Friday 27 June 2025
Target project kick-off	July 2025

**Please note, the successful solution provider will be expected to have availability for a 1-hour onboarding call via MS Teams on the date specified to begin the onboarding/contractual process.*

Eligibility

This challenge is open to sole innovators, industry, academic and research organisations of all types and sizes. There is no requirement for security clearances.

Solution providers or direct collaboration from countries listed by the UK government under trade sanctions and/or arms embargoes, are not eligible for HMGCC Co-Creation challenges.

How we evaluate

All proposals, regardless of the application route, will be assessed by the HMGCC Co-Creation team. Proposals will be scored 1–5 on the following criteria:

Scope	Does the proposal fit within the challenge scope, taking into consideration cost and benefit?
Innovation	Is the technical solution credible, will it create new knowledge and IP, or use existing IP?
Deliverables	Will the proposal deliver a full or partial solution, if a partial solution, are there collaborations identified?
Timescale	Will the proposal deliver a minimum viable product within the project duration?
Budget	Are the project finances within the competition scope?
Team	Are the organisation / delivery team credible in this technical area?

Invitation to present

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Successful applicants will be invited to a pitch day, giving them a chance to meet the HMGCC Co-Creation team and pitch the proposal during a 20-minute presentation, followed by questions.

After the pitch day, a final funding decision will be made. For unsuccessful applicants, feedback will be given in a timely manner.

Clarifying questions

Clarifying questions or general requests for assistance can be submitted directly to cocreation@hmgcc.gov.uk before the deadline with the challenge title as the subject. These clarifying questions may be technical, procedural, or commercial in subject, or anything else where assistance is required. Please note that answered questions will be published to facilitate a fair and open competition.

Routes to apply

HMGCC Co-Creation is working with a multiple and diverse set of community collaborators to broadcast and host challenges. Please follow this link for the full list of community collaborators.

If possible, please submit applications via a community collaborator.

If the community collaborator does not host an application route, please send applications directly to cocreation@hmgcc.gov.uk including the challenge title with a note of the collaborator network where this challenge was first viewed.

All information you provide to us as part of your proposal, whether submitted directly or via a collaborator platform, will be handled in confidence.

How to apply

Applications **must** be no more than six pages or six slides in length. HMGCC Co-Creation reserve the right to stop reading after 6 pages if this limit is breached. The page/slide limit excludes title pages, references, personnel CVs and organisational profiles.

There is no prescribed application format, however, please ensure your application includes the following:

Applicant details	Contact name, organisation details and registration number.
Scope	Describe how the project aligns to the challenge scope.

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Innovation	Describe the innovation and technology intended to be delivered in the project, along with new IP that will be generated or existing IP that can be used.
Deliverables	Describe the project outcomes and their impacts.
Timescale	Detail how a minimum viable product will be achieved within the project duration.
Budget	Provide project finances against deliverables within the project duration.
Team	Key personnel CVs and expertise, organisational profile if applicable.

Co-Creation terms and conditions

Proposals must be compliant with the HMGCC Co-Creation terms and conditions; by submitting your proposal you are confirming your organisation's unqualified acceptance of Co-Creation terms and conditions.

Commercial contracts and funding of successful applications will be engaged via our commercial collaborator, Cranfield University.

HMGCC Co-Creation supporting information

HMGCC works with the national security community, UK government, academia, private sector partners and international allies to bring engineering ingenuity to the national security mission, creating tools and technologies that drive us ahead and help to protect the nation.

HMGCC Co-Creation is a partnership between HMGCC and Dstl (Defence Science and Technology Laboratory), created to deliver a new, bold and innovative way of working with the wider UK science and technology community. We bring together the best in class across industry, academia, and government, to work collaboratively on national security engineering challenges and accelerate innovation.

HMGCC Co-Creation aims to work collaboratively with the successful solution providers by utilising in-house delivery managers working Agile by default. This process will involve access to HMGCC Co-Creation's technical expertise and facilities to bring a product to market more effectively than traditional customer-supplier relationships.

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FAQs

1. **Who owns the intellectual property?**

   As per the HMGCC Co-Creation terms and conditions, project IP shall belong exclusively to the solution provider, granting the Authority a non-exclusive, royalty free licence.

2. **Who are the end customers?**

   National security users include a wide range of different UK government departments which varies from challenge to challenge. This is a modest market and so we would encourage solution providers to consider dual use and commercial exploitation.

3. **What funding is eligible?**

   This is not grant funding, so HMGCC Co-Creation funds all time, materials, overheads and indirect costs.

4. **How many projects are funded for each challenge?**

   On average we fund two solution providers per challenge, but it does come down to the merit and strength of the received proposals.

5. **Do you expect to get a full product by the end of the funding?**

   It changes from challenge to challenge, but it's unlikely. We typically see this initial funding as a feasibility or prototyping activity.

6. **Is there the possibility for follow-on funding beyond project timescale?**

   Yes it is possible, if the solution delivered by the end of the project is judged by the HMGCC Co-Creation team as feasible, viable and desirable, then phase 2 funding may be made available.

7. **Can we collaborate with other organisations to form a consortium?**

   Yes, in fact this is encouraged, and additional funding may be made available. Please see the maximum budget of the individual challenge.

8. **I can't attend the online briefing event, can I still access this?**

   If a briefing event is held, which varies challenge to challenge, then yes. Either the recording or the transcript will be made available to view at your leisure after it has been broadcasted. This will be made available via the HMGCC Co-Creation community collaborators.

9. **Do we need security clearances to work with HMGCC Co-Creation?**

   Our preference is work to be conducted at OFFICIAL, we may however, request the project team undertake BPSS checks or equivalent.

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10. We think we have already solved this challenge, can we still apply?

That would be welcomed. If your product fits our needs, then we would like to hear about it.

11. Can you explain the Technology Readiness Level (TRL)?

Please see the UKRI definition for further detail.

12. Can I source components from the list of restricted countries, e.g. electronic components?

Yes, that is acceptable under phase 1 - feasibility, as long as it doesn't break UK government trade restrictions and/or arms embargoes.

Further considerations

Solution providers should also consider their business development and supply chains are in-line with the National Security and Investment Act and the National Protective Security Authority's (NPSA) and National Cyber Security Centre's (NCSC) Trusted Research and Secure Innovation guidance. NPSA and NCSC's Secure Innovation Action Plan provides businesses with bespoke guidance on how to protect their business from security threats, and NPSA and NCSC's Core Security Measures for Early-Stage Technology Businesses provides a list of suggested protective security measures aimed at helping early-stage technology businesses protect their intellectual property, information, and data.

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