

NSTIx Op-Tech Co-Creation Space

Challenge Form: Intelligent surveillance trigger

Pre-competition collaboration building events	Competition Release Date	Proposal Deadline	Expected Start Date	Duration	Indicative Budget
From Tuesday 15th August 2023	Monday 2 nd October 2023	Wednesday 1st November 2023	Monday January 8 th 2024	12 weeks	£60k (ex VAT) per solution provider and up to £180k (ex VAT) per consortia.

Responding to NSTIx OpTech Co-Creation

The National Security Technology and Innovation Exchange (NSTIx) is a government-led science, technology and innovation partnership that enables coherent and agile delivery of innovative national security outcomes through a co-ordinated and systematic approach to research and capability development.

NSTIx has established a government-led network of themed Co-Creation Spaces (CCS). The CCS' combine the respective power of specialist public and private sector partners in research, capability development and end user requirements. This supports the development of effective, user-driven technology at pace in areas that are critical to national security. For more information, please see the 'NSTIx Leaflet' in digital form (<https://www.gov.uk/government/publications/nstix-information-leaflet>).

Op Tech Co-Creation (OCCS) has engaged with a network of key Community Collaborators, to accelerate and leverage access to their existing networks of industry and academic Solution Providers.

By responding to this Challenge (details provided in 'Solution Provider Proposals – 'our ask' section) and participating in Co-Creation there is an exciting opportunity for collaboration between National Security, Community Collaborators and Solution Providers.

What is the current state for this Challenge?

Unmanned Aerial Vehicles (UAVs) offer National Security organisations the capability to provide surveillance from a stand-off position. These are typically mounted with electro optic sensors to track a person's movements. This requires an operator to pilot the UAV and a further person to process the live imagery ensuring full surveillance coverage.

There exist "follow me drones" (<https://dronesourced.com/drone-buyers-guide/best-drone-that-follows-you-follow-me/>), but this does not fulfil the use case in our complicated scenario where staying discreet is necessary, so altitudes may be high, and the angle of imagery is not always favourable so a person's face may not always be in view. Coupled with use cases in city location so buildings may obscure line of sight, movement from other people and vehicles increasing complexity, and the person under surveillance entering and exiting buildings. Currently, processing the live imagery / information is resource intensive and is open to human error, therefore it is highly desirable to integrate a level of intelligence or machine learning into a system that can provide a trigger when a person of interest comes into view.

The resulting surveillance trigger might be used to notify a human in the loop to verify this information, enable the UAV to continue its own surveillance task or to inform other teams to initiate other activities.

What is the gap?

To inform future capability development of novel approaches to overcome the challenge of providing an intelligent surveillance trigger of a positive identification of a person of interest. Ideally this would lead to significantly reduced human interaction, noting human machine teaming will always be required for key decision making.

The surveillance trigger could be based off a database of information, for example facial recognition, a person's gait, or other novel identification methods. The benefits of intelligent and unsupervised learning could also be utilised to improve reliability.

This Challenge

This Challenge will last for 12 weeks with an indicative budget of £60k (ex VAT) per solution provider. We are keen to encourage consortiums to form and provide joint proposal, as such a higher budget of up to £180k (ex VAT) will be available for consortia, with a total portfolio ceiling budget up to £540k (ex VAT).

The focus of the proposal should be on the unsupervised processing of surveillance information for a machine to intelligently provide a trigger or notification that a human in the loop or a UAV can act upon. The vehicle of delivery (i.e., UAV) is not the focus, though the technology developed will likely but not necessarily be used with a commercial UAV, so interoperability should be considered for future phases of work.

To further steer, several options could be considered:

- Positive identification could come from traditional image processing or deep learning techniques.
- Broader person identification techniques beyond facial recognition or other datasets beyond imagery.
- Utilising AI/ML algorithms to positively identify a person from available data sources.
- Edge processing to provide real-time information without the need to be cloud connected.
- The proposal should consider what data sets would be necessary to activate the trigger (be it captured imagery footage, open-source, synthetic etc). As this project is open to innovative methods.
- Thought should be given to future ethical and legal compliance implications.
- We will not be able to provide datasets, please consider in your proposal what training data could be used.

The outcome of this challenge should be a demonstrator, which could be a lab-based demo, a video showing the capability or a field-based demo, showing the concept of an intelligent surveillance trigger. This should not be UAV mounted at this stage, but consideration should be given to how this may be integrated in the future phases of work. Alongside this we expect a report detailing the developments, findings and future recommendations.

The proposal should also consider future phases of work, which could include a timeline, possible costs, and routes to exploitation leading to operational deployment.

What we don't want

- A UAV.
- High TRL developments (the focus should be on a step change of capability).
- Iteration on facial recognition technology

Pre-competition phase

We wish to have the greatest collaboration between various sectors and disciplines. We think that the following non-exhaustive list of expertise will be vital and key to achieve the best outcome collaboration between these disciplines is vital; AI/ML, deep learning, data science, computer vision, neural nets, novel sensors, future semiconductors, FPGAs, modelling, decision making, engineering.

To encourage cross collaboration between various sectors and disciplines, a pre-competition phase facilitating consortium building will be hosted from **Tuesday 15th August to Friday 29th September**. Within this period an **Online Briefing Call** will be held on **Tuesday 22nd August** to further explain this Challenge and the approach to consortium building. Following this there will be an **online event on the Tuesday 12th of September, a physically held event in London on Tuesday 19th September and a physically held event in the Midlands Tuesday 26th September** to facilitate lightning pitches from industry and academia to explain their expertise and background, followed by open and/or breakout sessions to encourage collaborative discussions. As part of this consortium building, there will also be an online forum held throughout this period to encourage enduring conversations for those unable to attend any of the events.

Failure to attend the Briefing Call or pre-competition events does not exclude solution providers from submitting a proposal by the deadline stated below.

Follow-on project

If this initial funded project demonstrates the concept to be feasible, and the OCCS team agree, there is the potential for multi-year, multi-million-pound funding leading to operational deployment. Therefore, it is encouraged that proposals view to de-risk the hardest components of this Challenge in the first phase with a view to a long-term collaboration.

Solution provider Proposals – ‘our ask’

This Challenge is open to sole innovators and to organisations of all types and sizes. This includes UK registered businesses of any size, research organisations, and research and technology organisations. Consortia are encouraged where a sole lead organisation contracts with the Authority & flows the terms, conditions, IP & payments, to the consortium members.

The Authority will evaluate tenders in accordance with the procurement principles of transparency, equal opportunity and non-discrimination & evaluation criteria provided. The Authority reserve the right to make the final decisions as to which proposals are taken forward to apply for funding in the competition.

Community Partners are welcome to participate in both coordination and delivery of the workstreams to support the solution providers – please contact us to discuss this approach if you are considering a multi-partner approach. We are happy to be guided by Solution Providers proposals regarding the number and duration of these sprints within the **maximum 12-week** period.

Evaluation criteria

Proposals will be scored 1 – 5 on the following criteria:

- Timescale – will the proposal deliver a Minimum Viable Product within the time period defined within this Challenge Form?
- Does the proposal fit within the Challenge scope, taking into consideration cost and benefits?

- Is the organisation / delivery team credible in this technical area?
- Is the technical solution credible?
- Will the proposal deliver a full or partial solution? Has the proposal identified collaborators if a partial solution or is willing to work collaboratively with others?
- Is it innovative?

Next Steps



Confidentiality: All proposals will be subject to commercial confidentiality and a maximum protective marking of OFFICIAL. Please do not submit any materials above this classification.

Technology Readiness Level (TRL): A cross-section of TRLs 1 – 6 will be considered for this Challenge.

Pre-competition phase – Briefing call - An open Briefing Call via MS Teams will be held on **Tuesday 22nd August 10am – 11am**, where members of the OCCS Challenge Team will be available to provide additional context and information on this Challenge, and will discuss approach to consortium building.

Briefing call link: Click [here](#)

Teams Meeting ID: 321 946 702 266 Passcode: TQZYpu

Pre-competition phase – Collaboration Events: There will be an online event on the **Tuesday 12th of September**, a physically held event in **London on Tuesday 19th September** and a physically held event in the **Midlands Tuesday 26th September** to facilitate lightning pitches from industry and academia to explain their expertise and background, followed by open and/or breakout sessions to encourage collaborative discussions. A calendar invite for this call with dial-in details will be sent nearer the time.

To **register your attendance**, please contact Paul.larcey@iuk.ktn-uk.org stating which event you would like to register for.

Failure to attend the Briefing Call or pre-competition events does not exclude solution providers from submitting a proposal by the deadline stated below.

Frequently Asked Questions – responses (FAQ): Clarification questions can be submitted to cocreation@hmgcc.gov.uk via email before the deadline. All enquiries from the Briefing Call and via email will be collated, and responses sent to all parties in an FAQ document by **Monday 16th October**.

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Pricing: Solution Providers are invited to submit **Fixed Price** proposals for the **12 week** engagement. When preparing pricing please provide pricing against 3 monthly payment points in line with the sprint-profile of your project.

Deadline: The deadline for proposals to be submitted is close of business on **Wednesday 1st November**. Please note that shortlisted Collaborators may be invited to pitch prior to contract award.

Selection and notification of finalists: The OCCS Challenge Team will select a shortlist of successful proposals by the **Thursday 9th November** and invited to a pitch day.

Pitch day: The OCCS Challenge Team pitch day will be on either **Thursday 16th or Friday 17th November**. An option to attend face to face or online may be made.

Format: Final responses for this challenge are to be provided directly via the [KTN Innovation Exchange](#) portal. Please complete a Request For Quote form available via the KTN Exchange Portal, and provide any appropriate supporting documents.

Feedback: All applicants will be provided with written feedback via the Community Collaborator once both technical and commercial assessments have been concluded. We will endeavour to provide feedback within 2 weeks of the competition deadline.

Commercial Engagement: The OCCS challenge team will select Solution Providers for this Challenge on the technical and commercial merit of the proposal received, commercial contracts and funding will be engaged through Cranfield University. Intellectual Property deliverables will be engaged with the OCCS under the terms attached.

Project start date: The target project start date of contracted solution providers is the Monday 8th January 2024 with an end date of Friday 29th March 2024.

Commercial Considerations – regardless of the commercial route selected the following terms apply

Please note that by submitting a proposal in response to this challenge you are agreeing to the terms and conditions of contract as issued and are thereby making a formal offer of contract, from which the Authority shall have the right to accept in part or in full should your proposal be deemed acceptable.

#	Category	Consideration
1	IP	Intellectual Property (IP) will be managed in accordance with the attached Terms & Conditions.
2	NDA	It is the responsibility of the Community Collaborator to propagate and adhere to the agreed Non-Disclosure Agreements (NDAs).
3	IT Systems	The Community Collaborator and/or Solution Provider IT system will be used as the collaboration platform for developing solutions to this challenge (including for example MS Teams, SharePoint, plus any required development and test environments). Systems must be capable of holding documents marked at OFFICIAL.
4	Data	All data will be managed in accordance with UK Data Protection legislation. This includes commercial & project documentation, and any data utilised in developing, testing and implementing the solution for this challenge.

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5	Scope	Solution providers for this challenge may be from the UK or 5EYES geographies. Other geographies will be considered on a case-by-case basis.
6	Clearance	All work will be classified at no higher than OFFICIAL. It is desirable for resources working on the project from Community Member organisations to have BPSS or SC (or equivalent) clearance, however this is not essential at this stage. Collaborators are asked to please state the clearance levels of their proposed Project Team within their submitted proposals.

*Onboarding of a company onto our commercial Terms & Conditions can take up to an additional 4 weeks.