HMGCC Co-Creation

Realistic prosthetic facial masks for training exercises

Summary of the challenge

The most realistic face disguises possible are needed by national security to help anonymise faces during exercises in which AI surveillance models are being tested and trained. This makes it possible for any data gathered during exercises to be shared more widely.

HMGCC Co-Creation is inviting organisations to take on the 12-week challenge and develop prosthetic face mask prototypes, using skin like materials which could outdo traditional silicone.

Applicants from those working in engineering biology, healthcare, and the TV and film industries could be interested in taking part in this challenge.

HMGCC Co-Creation will provide funding for time, materials, overheads and other indirect expenses for successful applicants.

Technology themes

Biology, chemistry, healthcare, materials science and engineering, manufacturing, model prototyping, physical forensics.

Key information

Budget per single organisation, up to	**£60,000**
Project duration	**12 weeks**
Competition opens	**Monday 15 September 2025**
Competition closes	**Thursday 16 October 2025 at 5pm**

Context of the challenge

National security agencies use surveillance products to track activities and individuals suspected of malicious activity. Increasingly AI is being used to flag activity of interest. Before deploying new systems, they must be thoroughly tested.

The use of AI models which learn and improve from the collected data raises privacy and ethical concerns, even during training exercises using volunteers. To address this issue, organisations are turning to a simple yet effective solution: anonymising individuals by using prosthetic facial masks. This approach also enables agencies to share training data with partners. However, to make this solution effective the masks must be highly realistic to ensure accurate AI model development.

The gap

Whilst silicone based prosthetic face masks can be effective, post-processing work to help them appear realistic, for example with skin tones, scar details and addition of hair, can be significant. This labour-intensive process demands significant skill and artistry.

Advances in camera technology, which can detect even slight imperfections, also mean that silicone masks are becoming increasingly outdated.

To overcome this challenge, new materials are needed that can mimic the look and feel of human skin. By developing more realistic alternatives, it's possible to create prosthetic masks that are virtually indistinguishable from real faces and therefore can work more effectively in AI training.

Example use case

Bavin is developing a cutting-edge surveillance system with enhanced sensors and including an AI model trained to spot suspicious activity. This advanced system will be legally deployed in a limited number of important operations.

Before it is used, the system has to be tested to check it can identify certain activities in a crowd of people. The goal is to test the limits of the system by simulating difficult conditions such as varying lighting, obscuring faces and using challenging camera angles...

Lizzy, the training exercise manager, needs a large pool of participants to make the test realistic. She also wants to share information gathered with international allies, so she must ensure that the participants' identities remain anonymous. To achieve this Lizzy previously used silicone masks but, as Bavin's advanced surveillance system is highly sensitive and requires high quality training data, they aren't realistic enough.

Lizzy is using new and advanced prosthetic masks using synthetic skin. With a large number of participants and limited budgets, the masks must be relatively low cost,

easy to apply without the use of specialist make-up artists and be reusable for the next training exercise.

Project scope

Applicants should aim to deliver a demonstrator in this 12-week project to at least technology readiness level (TRL) 6. Developments in areas such as engineering biology, healthcare, and the TV and film industries are encouraged to apply. Essential and desirable requirements are listed below along with constraints and what is not required.

Essential requirements:

- Synthetic skin-like material that looks identical to real skin.
- Ability to add colour to the material to reflect different ethnicities.
- Ability to insert hair.
- When set, the synthetic skin needs to stretch and be malleable like real skin, to allow for movement.
- Material must be mouldable to different shapes. Possibly supplied as a sheet or a liquid.
- Durable and easily transported.
- Non-toxic.
- Must be stable at -20°C to 60°C.

Desirable:

- Can offer different thicknesses of skin, which could be used for different applications. For example, thickness of synthetic skin around the eyes may be thinner than the cheeks.
- Ability to 3D print.
- Bespoke colours, shades and textures could be applied.
- Robust enough for six months use before replacement.
- Breathable material.
- Able to replicate different layers of skin (epidermis, dermis and hypodermis).

Not required:

- Silicone only based material.

Dates

Competition opens	Monday 15 September 2025
Clarifying questions deadline	Tuesday 30 September 2025 at 5pm
Clarifying questions published	Tuesday 7 October 2025
Competition closes	Thursday 16 October 2025 at 5pm
Applicant notified	Friday 31 October 2025
Pitch day in Milton Keynes	Thursday 6 November 2025
Pitch Day outcome	Monday 10 November 2025
Commercial onboarding begins*	Tuesday 11 November 2025
Target project kick-off	December 2025

*Please note, the successful solution provider will be expected to have availability for a one 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?

This information may be exempt under the Freedom of Information Act 2000 (FOIA) and may be exempt under other UK information legislation. Refer any FOIA queries to the originating department.

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

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

Please send applications directly to cocreation@hmgcc.gov.uk, including the challenge title with a note of where this challenge was first viewed.

All information you provide to us as part of your proposal 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.

This information may be exempt under the Freedom of Information Act 2000 (FOIA) and may be exempt under other UK information legislation. Refer any FOIA queries to the originating department.

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.
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.

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.

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.