DSTA@71 Innovation Call

Submission deadline: 31 May 2019

1. Countering Drones in Urban Environments

The rapid proliferation of drones is bringing about unprecedented threats to safety and security worldwide, from drones used for terrorism-related activities in the Middle East to drone sightings in airports. The threat is further exacerbated by emerging technologies such as drones that are not controlled by radio frequency links and swarm technologies. Urban settings such as Singapore also face unique challenges such as dense population and cluttered environments, which restrict the applicability and effectiveness of various counter-drone technologies.

Challenge Statement

• To develop a cost-effective and scalable solution for surveillance and/or safe neutralisation of rogue drones in an urban setting.

Deliverables

- To submit a proposal for the solution (either surveillance and/or neutralisation).
- Accepted teams will further develop or refine their solutions for the next 6-12 months. Thereafter, teams will demonstrate their solutions to perform either surveillance and/or neutralisation of rogue drones in unknown scenarios.
- · Selected teams may be invited to participate in actual deployment projects after the challenge.

Technical Evaluation Criteria

- Both the drone threat and counter-drone industry are developing rapidly. The proposed solutions should be novel, potentially game-changing and address one or more key challenges in countering rogue drones in urban settings, such as:
 - · Drones not controlled by RF control link/inputs
 - · Swarm technologies
 - Safe takedown/neutralisation
- Conventional performance parameters, such as (i) cost and scalability, (ii) accuracy and speed, (iii) automation, and (iv) safety/collateral damage will also be taken into account.

Submission Requirements

- Administrative details: date, name of organisation, primary representative, contact details, team name, team members and appointments
- Title of proposal
- Proposal summary
- · Proposal details, including:
 - · How is this solution novel/different from what is available currently?
 - · What are the key challenges it seeks to address?

2. Generating 3D Indoor Models from Open Source Information

Time and situational awareness are of the essence when responding to terrorist incidents. This can be addressed by leveraging open source information for mission planning enroute to an incident site.

Challenge Statement

• To develop a minimum viable software that can generate 3D indoor models of buildings from open source information, for annotation and sharing on tablets.

Deliverables

- To provide a software that:
 - · Rapidly generates a 3D model from open source information (individual floors)
 - · Identifies entry points, layout, floors, staircases, lifts
 - · Has annotation and information sharing functions on Android tablets
 - Works on unknown site other than the reference building that is given at the start of the Innovation Call
- · Stretch goals:
 - · Layering of floors on a 3D model
 - Function to incorporate incident specific information (e.g. damage to east side of building, fire on first floor, etc.) for better situational awareness

Resources

- · Reference building: ION Orchard (all floors)
- Open source information is up to the team but proof of origin should be shown.
- Onsite 3D scanning of the building is not allowed.

Technical Evaluation Criteria

• You will be assessed based on the time taken to generate the model, intuitiveness of model features, ease of annotation and sharing, testing on an unknown site, as well as the stretch goals.

Submission Requirements

- Administrative details: date, name of organisation, primary representative, contact details, team name, team members and appointments
- Title of proposal
- Proposal summary
- Main features
- · Scope and schedule of next level development if awarded



3. Securing USB PKI Token with Storage Capabilities

With an increased emphasis on cybersecurity, public key infrastructure (PKI) authentication is key for secure applications and most commonly implemented in a USB form factor. It is desirable to integrate this PKI token with storage capabilities to streamline the number of USB devices one has to carry on the ground.

Challenge Statement

• To develop a cost-effective solution that can perform both PKI authentication and storage of data in a single USB device.

Deliverables

- To submit a proposal for the solution, including but not limited to the following:
 - Technical specifications
 - Production timeline
 - Plan on how to scale up production
 - Cost of unit product

Technical Evaluation Criteria

• The PKI authentication chip has to fulfill the following technical criteria:

- FIPS 140-2 Level 3
- EAL 5+
- PKCS #11 Version 2.2

• The storage capabilities have to fulfill the following technical criteria:

- · 32GB and above
- USB 3.0

• Other device requirements:

- Windows 10
- Ruggedised for outdoor environment
- Tamper evident casing
- USB form factor

• As a guideline, physical form factor should not exceed 80mm x 25mm x 15mm.

Submission Requirements

- Administrative details: date, name of organisation, primary representative, contact details, team name, team members and appointments
- Title of proposal
- Proposal summary
- Proposal details

For enquiries, please contact 71@dsta.gov.sg.

Selected teams may apply for Gov-PACT grants with Enterprise Singapore for further product development or testing, subject to eligibility and feasibility of the proposal.

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