Ideation and Presentation

Introduction

This is the place where you can work on real life problems and challenges and gain knowledge of the current state-of-the art technologies. These problems require a lot of effort to solve and would take significant amount of your time. These can serve as long term projects. You only have to **present your idea** of solving a problem in form of a Power Point Presentation during the event. The ideas that the judges find **worth pursuing** will be **funded** in the future for completion of the projects.

Problem Statement

Following are some ideas that are collected from ongoing challenges and are taken from fields that are as wide as possible. Besides these problems one can submit his/her on innovative solution to any other problem that is not mentioned in this list.

1. ### GPS Anti Jam Device (StartupIndia):
   https://www.startupindia.gov.in/content/sih/en/ams-application/challenge.html?applicationId=5c2b0e78e4b0bd844e953beb

   Military organisations depend heavily on GPS technology for accurate navigation positioning and communication. GPS signals are susceptible to interference and intentional jamming affecting their reliability.

   Specifications Required

   Design and development of GPS anti Jam and anti-spoofing device to mitigate GPS degradation in a jamming environment which is capable of integration with existing aerial and ground-based platforms in use

2. ### Wireless Energy Meter (SSIP Gujrat):
   http://ssipgujarat.in/gih/problem_statement.php

   Today, government or private organizations need to personally visit the industries for checking the energy ratings. This is quite difficult to visit and audit the energy ratings. As day-by-day industries are growing, it would be more difficult to audit personally. There may be case of corruption in the audit of energy measurement. To cure these problems wireless energy meter can be installed to accurate and time to time measurement.

3. ### Driving Licence Controlled Smart Vehicle (SSIP Gujrat):
   http://ssipgujarat.in/gih/problem_statement.php

   Challenge description witd context As per rto rule, driving a vehicle without license is an offense and manually it is very difficult to check everyone who is not holding license and driving vehicle. Every year around 5,00,000 accidents happen, leaving some 1,50,000 people dead. "more people have died in road accidents than in all the wars india has fought," and it

is really scary to drive on the roads when nobody observes traffic rules. Access to the vehicle must be prevented for the person who is not holding driving license.

Exact Problem Road accidents due to ineligible drivers can be reduced and safety can be increased by preventing unauthorised access to vehicle from a person who is not having license and other than actual user of that vehicle. RTO can have simplified process of traffic problem. Unfortunately, if accident happens, RTO as well as police can easily detect identity of a person by biometric data available with license and linked at central server of RTO.

4. DEEP LEARNING FOR CYBER SECURITY (DRDO):
http://122.252.233.36/kalamdb/portal/kalam-details.html

With the increasing in-depth integration of the Internet and social life, the Internet is changing how people learn and work; it also exposes us to increasingly serious security threats. How to identify various network attacks, particularly not previously seen attacks, is a key issue to be solved urgently.

Machine Learning/Deep Learning (ML/DL) based techniques can be explored to increase the detection rate of known intrusions and to reduce false positive rate of unknown attacks. Deep learning-based techniques can be investigated and employed to achieve protection from zero-day attacks.

5. HEAMOSTATIC AGENTS (DRDO):
Hemostasis is defined as "the stoppage of bleeding, hemorrhage, or blood flow through a blood vessel or body part." Hemostatic agents improve hemostasis by improving primary hemostasis, stimulating fibrin formation, or inhibiting fibrinolysis.

In medical emergency conditions, bleeding needs to be stopped immediately by utilizing hemostatic agents. These agents are very much required to save lives of injured soldiers on the battlefield.

Ideal Characteristics of Hemostatic Agents

- Being capable of stopping large-vessel arterial and venous bleeding in less than 2 minutes of application, and the ability to be delivered through a pool of blood when applied
- Being ready to use with no requirement for on-scene mixing or pre-application preparation;
- Being simple to use by the wounded victim, a 'buddy' or a medic, with minimal training;
- Having lightweight and durable properties
- Having a minimum 2-year shelf-life, in extreme environmental conditions (ideally at a temperature range of −10°C to +55°C);
- Being safe to use with no risk of further injury to tissues or transmission of infection; and
- Being inexpensive.

6. ARTIFICIAL OXYGEN CARRIERS (DRDO):

Artificial oxygen carriers aim at improving oxygen transport and oxygen unloading to the tissue. Artificial oxygen carriers may thus be used as an alternative to allogeneic blood transfusions or to improve tissue oxygenation and function of organs with marginal oxygen supply.

These helps to avoid the risks of disease transmission and immune suppression, address the chronic blood donor shortage.

It is required to develop an Artificial oxygen carrier aimed at improving oxygen transport and oxygen unloading to the tissue with minimal endurance of 6 hours.

7. COGNITIVE SENSORS AND TECHNOLOGIES FOR BORDER/PERIMETER SURVEILLANCE(DRDO):

It is required to realize and deploy an integrated sensor infrastructure with learning capabilities to provide comprehensive surveillance on the Indian borders and perimeters of security sensitive installations, formations and movements. The sensor should have self-power generation and management capability to provide solution in unmanned area for long durations. It should have threat computing, wireless networking and routing capability to appropriately communicate the sensing information to stake holders. Safety and security including self-deactivation/destruction are mandatory features in the proposal.

The sensor should have Learning capability and act accordingly (to identify the expected usage of the detected signal and raise alarms on predefined and/or learned events). The possible areas of sensing are enumerated below. Other possibilities can be looked into:

- Sense frequency spectrum including signal intelligence/communication intelligence features on regular basis as well as based on an event.
- Detection of movement of objects (person, animals, vegetation and vehicles) on regular basis or on event based.
- Detection of presence of chemicals, high energy materials or poisonous gases on regular and event-based occurrence.
- Detection of audio signals including language and generation & routing of alarms on special/unknown /first time pattern of audio threats.
- Detection of presence of body smells on regular /first time basis and alarm accordingly.
- Disturbance of magnetic field due to the entry of metal-based objects in the area of surveillance.
- Detection of change of physical scenario within surveillance area.
- Face, Body structure and posture recognition feature.
- The technology of sensors, networking should be miniature, rugged and have stealth features. Its RCS/visual appearance should amalgam with the ambience.
- The solutions should be based on executable and implementable technologies.

8. OTHER PROJECT

Beside the above-mentioned projects, you can present a solution to any other long-term project.

EVENT RULES AND SPECIFICATIONS

1. RULES

* Team size is restricted up to 10 members.
* Participants shall not be allowed to be part of more than one team.

2. SPECIFICATIONS

* Participants have to come up with ideas to solve the problems.
* The ideas should be presented in a predefined format given to them in form of a Power Point Presentation on the day of the event.
* One or two members of the team must present their idea in front of the jury and must be present during the event.

3. JUDGING CRITERIA

* Quality and feasibility of solution.
* Further criteria will be decided by the judging committee.

FORMAT

The format of the presentation should be as follows.

1. Slide 1 -Title or Problem statement.
2. Slide 2 - Describe your idea/solution.
3. Slide 3 – Describe your Technology stack here.
4. Slide 4 – Describe your use case here.
5. Slide 5 – Describe your Dependencies/Show stopper here.

CONTACT DETAILS

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All decisions taken by the organizing team will be deemed as final, and no more changes will be encouraged, thus holding the full authority to change any of the above rules as per circumstances.