EDA-B PRJ RT 1058

AUTOMATIC TARGET/THREAT RECOGNITION, IDENTIFICATION AND TARGETING FOR LAND SYSTEMS – ATRIT

Participating Members

Consortia/Organization

RHEINMETALL DEFENCE · THALES · PGO · DIEHL Defence · TNO innovation for life · SAFRAN · Fraunhofer FKIE · HENSOLDT Detect and Protect · Fraunhofer IOSB · IABG · ISD S.A. Integrated Systems Development

Automatic targeting is an important application area for Land Systems. In this field, autonomy can support the targeting process for identification, tracking, prioritization and selection of targets and, in some cases, target engagement. Targeting beyond line of sight (BLOS) for artillery or for military operation in urbanized terrain (MOUT), among others, with support of autonomous functions will significantly improve the performance through a better assessment of: the target environment, friend/foe identification, battle damage assessment and reduction of collateral damages.
Target identification capabilities are improving enormously in weapon systems, with some advances in levering computer vision and artificial intelligence, in order to develop autonomous target acquisition technology. These will also be integrated with fire control technology, aimed at providing ground combat vehicles with the capability to acquire, identify, and engage targets at least 3X faster compared to the current manual processes.
However, one of the problems of automatic targeting systems is their high sensibility to variations in the environment and, as soon as the weather conditions deteriorate and the target background becomes cluttered, the false detection rate of automatic targeting software increases significantly. Existing autonomous systems are fitted with rudimentary capabilities to distinguishing simple objects in 'low clutter', relatively predictable and static environments.

Objectives

The objective of ATRIT is to define and design (Phase 1) and develop (Phase 2) a set of demonstrators able to:
» automatically detect and identify land systems' targets/threats, and
» contribute to the combat engagement with automatic allocation of targets.
Therefore, ATRIT proposes to improve force protection as well as to contribute to a more effective and efficient engagement of land forces.
In order achieve the objective, ATRIT will provide a feasibility study and recommendations as a basis for proposing solutions for demonstrators dealing with both automatic threat detection and target allocation. ATRIT will be constituted of a capability-orientated analysis and will commonly define possible tactical threats in order to deduce the corresponding technical and tactical requirements:
» Module 1: Target/threat detection by video-based analysis of human behaviour;
» Module 2: Improved sensor data fusion for defined combat distances based on 360° situational awareness;
» Module 3: Integrating real time sensor information with C4I and comparison with historical data to improve target / threat recognition and identification;
» Module 4: Cross-platform 360° situational awareness, with fast threat recognition, distribution and sensor-to-shooter allocation for vehicles and dismounted soldiers;
» Module 5: Presentation of information covering real-time sensor data, C4I and historical data to support vehicle crew members in effective and fast decision-making.
ATRIT (phase 2) will further develop lab prototypes of Human-Machine Interfaces (HMI) concepts. Selected solutions and approaches will be implemented in a demonstrator for testing and demonstration in a relevant environment.

Work Strands

The project is currently in the preparation phase and planned to start in early 2022. Phase 1 will be executed in 2022-23.
The five modules will be executed concurrently. Modules 1, 2 and 3 will provide the analysis of the problem (e.g. threats, possible sensors, HW/SW-Requirements, including energy and power and common data processing) for the architecture derived in Module 4. Module 5 will show how the data can be displayed to the user.

Way Ahead

ATRIT II (Phase 2) will be executed between 2024 and 2026.
Results from this project will provide great opportunities for the defence industry to define roadmaps useful for improving current product portfolio and for investigating new products and solutions for the next 10-20 years.

Link to TBBs, other CapTechs, and other links

- OSRA TBB 65 - Management and Processing Information from Heterogeneous Sources
- OSRA TBB 71 - Information Process Enhancement by using AI and Big Data
- OSRA TBB 74 - Land Systems Architecture & Integration.
- OSRA TBB 79 – Target / Threat recognition and identification.
- OSRA TBB 110 – Passive imaging systems
- OSRA TBB 111 – Novel optical configurations
- OSRA TBB 114 – Image processing
- OSRA TBB 118 – Data fusion and systems integration
- OSRA TBB 119 – Detection, Tracking and Recognition of Challenging Targets
- OSRA TBB 129 – Artificial Intelligence (AI) and Big Data (BD) for Decision Making Support

GDELS - ASCOD IFV

Contact
Mario Martinho CapTech Land Moderator
mario.martinho@eda.europa.eu

EDA Activities
www.eda.europa.eu/what-we-do/all-activities