

Creating a prototype system (up to TRL 6) for advance and autonomous monitoring of radio emitters used by illegals on the «ALSR external EU border»*.

Challenges and objectives:

Illegals – goods’ smugglers, human traffickers – are actively using latest communication, location tracking IoT sensor and drone technologies for illegal transporting over the «ALSR external EU border»*. Project Radio2S is aiming to develop capability of early detection of potential illegal activities by localizing radio signal transmitting devices (emitters) used by illegals. Existing technologies are limited in full scale border monitoring deployment. And vast radio spectrum provides a potential for illegals to hide while now there is limited accumulated knowledge by AI to identify the natural activities versus acts of illegal trafficking. Radio2S is aiming to address those challenges and the project’s objectives are:

- Enhance radio emitting device identification and localization capabilities;
- Develop innovative and adaptable technological solutions for border monitoring;
- Provide framework for easy deployment of the technologies for practitioners working on EU countries’ external borders;
- Provide enhanced and automated border infringement evidence collection toolset.

Technical goals:

- Provide autonomous emitter detection and localization capability in multiple radio frequency ranges;
- Develop embedded artificial intelligence (AI) technologies to improve RF signal analyzer and passive radar capabilities;
- Modularize multi domain sensor applications into self-contained and scalable components;
- Introduce system integration framework for alarm visualization to «end-users» over C2 system for situation awareness and decision-making support;
- Develop approach and tools of streamline, automatize and lawfully correct way of evidence collection.

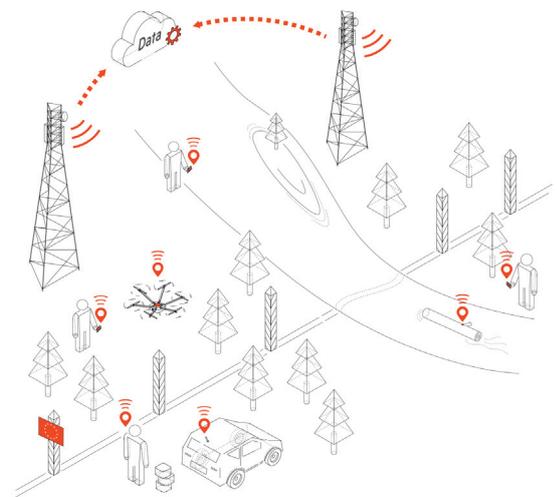
Expected impact:

- Introducing new border monitoring capabilities for the emitter detection and localization;
- Strengthening EU’s security by providing methodology and recommendations of radio frequency scanning on «ALSR external EU border»*;
- Improving toolset for lawfully correct way of evidence collection to support legal proceedings.

Market’s needs:

«Tobacco product contraband causes 11 billion euros of damage to Europe annually»**. From our estimates, about 4% of smuggling of different illegal goods happens on «ALSR external EU border». Additionally, human trafficking is another issue. The border has 12 033 km of the land and 32 719 km of the sea line. Conventionally, border R&D has been focusing on strengthening authorized border crossing areas. But it’s quite evident that with shortage of EU practitioners and vast land border kilometres the challenge also on «ALSR external EU border» needs to be addressed. We believe that Radio2S is the solution needed.

Prototype system nearby external border of EU



Core partners:

- Industry—one (LV), looking for 2;
- Practitioners—one (LV), looking for 5;
- Other—one (LV);
- SME—LV (one), looking for 2;
- Research Institutions—looking for 3;
- Academia—one (EE), looking for 2

Profile required:

- «End-users»—Border guards and law enforcement agencies (EU);
- Radio frequency receiver, active and passive radar manufacturers;
- Spectrum monitoring software, sensor data analysis and data fusion experts and developers;
- Emitter localization scientists/experts;
- Embedded artificial intelligence experts;
- Software component providers for large scale multi-domain IoT sensors.

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* ALSR external EU border—a territory (Air, Land, Sea, River) on EU’s external border without authorized border crossing points;

** <https://bit.ly/3dd8UoB>