PROJECT PESCO

PErvaSive Communications - RESTART
Spoke 1 on Pervasive and Photonic
Network Technologies and Infrastructures

The Future Pervasive Internet will be an extremely complex environment, where communication and sensing functions will be integrated exploiting a multitude of complementary enabling technologies, and where functionalities will also be embedded into (beyond-edge) users and IoT devices, which will become an integral part of the pervasive network. Addressing this vision, PESCO sets itself at one of the strategic crossroads for the development of beyond-5G and 6G networks, also integrating future generation sensing components in a holistic way. PESCO addresses the complexity of the research challenges posed by this scenario in a comprehensive way, involving a multiplicity of key expertises. Based on a comprehensive architecture, PESCO will deliver the critical components in the fundamental areas of: (i) novel user-centric pervasive Internet paradigms including IoT and users' devices; (ii) integrated sensing and communication technologies; (iii) edge intelligence supporting pervasive environments; (iv) novel sensing paradigms exploiting diverse communication technologies; (v) holistic sensing and communication cognitive approaches taking into account broader environmental aspects, like, for instance, energy efficiency. PESCO implements a multi-faceted performance evaluation approach, composed of a blend of analytical modelling, large-scale simulation and prototyping, to deliver key results in the aforementioned areas. CNIT RaSS Lab activity is focused on the study of the synchronization requirements for radar MIMO system on drone swarm, on the synchronization technique integration and on the experimental test/validation. Detect and track air and sea targets at long range (over the horizon), far beyond currently existing systems, by using the reflections of skywave and surface-wave propagated signals.

Keywords: Radar systems, Radar signal processing.

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Technical Sheet
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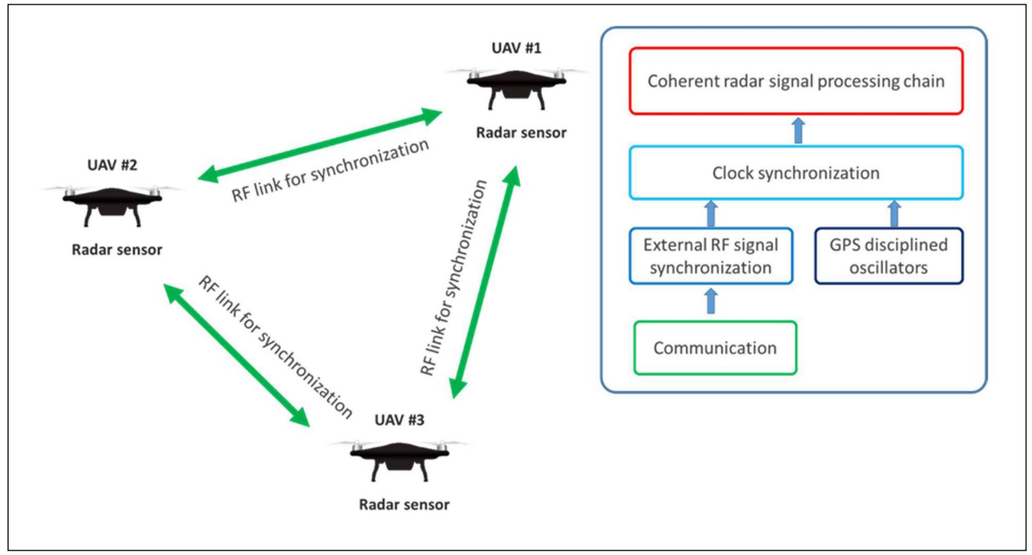
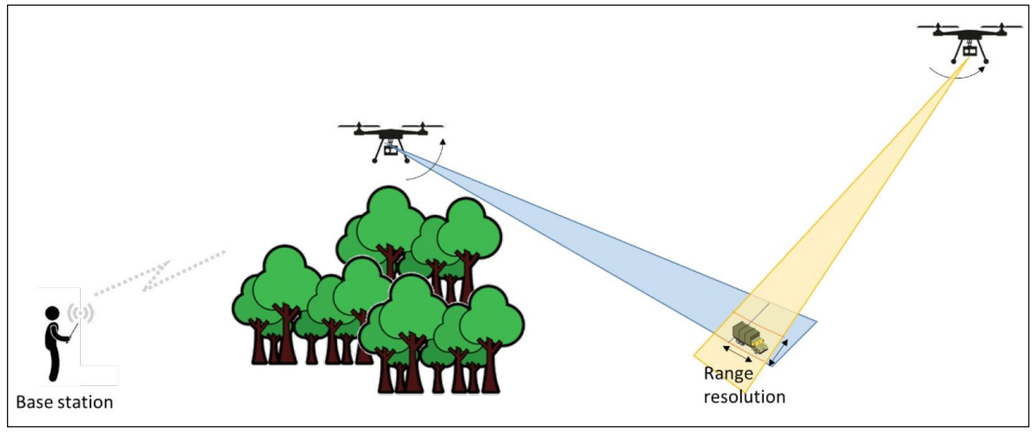
Project duration
January 2023 - December 2025
Involved countries
Italy

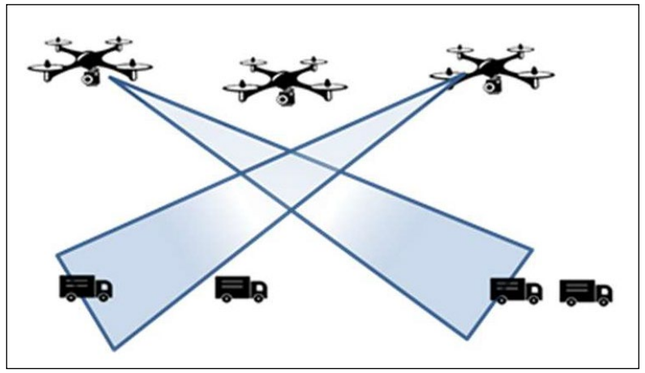
(a) Swarm of drones synchronization conceptual image



(b) Logical architecture of the use case related to the swarm of drones synchronization



(c) Swarm of drones reference scenarios: scenario 1 - detection and localization of moving targets



(d) Swarm of drones reference scenarios: scenario 2 - multistatic radar imaging.