PROJECT SARAI

SARAI - SAR
signature simulation of targets

The objective of the project is to develop a simulated operating environment IMINT (Imagery Intelligence). This will be done through the formation of a multilevel deep learning network in order to “understand” the SAR images and time series by learning the functionalities without technical supervision and to carry out specific detection, classification and / or recognition tasks by specializing the technologies developed for the identified scenario. The objective of the activity is to support the execution of the tasks planned for Phase 1 of the SARAI project. In detail, the activity includes the following activities:

Task 1:
- Development, calibration and test of a SAR signature simulator with the following functions:
- Exploitation of 3D CAD geometric models characterizing the target and the surface where the target is located.
- Exploitation of the physical parameters characterizing the target materials (directly or indirectly through the definition of the diffusion and reflection coefficients).
- Modeling of the SAR backscattering mechanism including the geometric configuration and reflection parameters of the material.

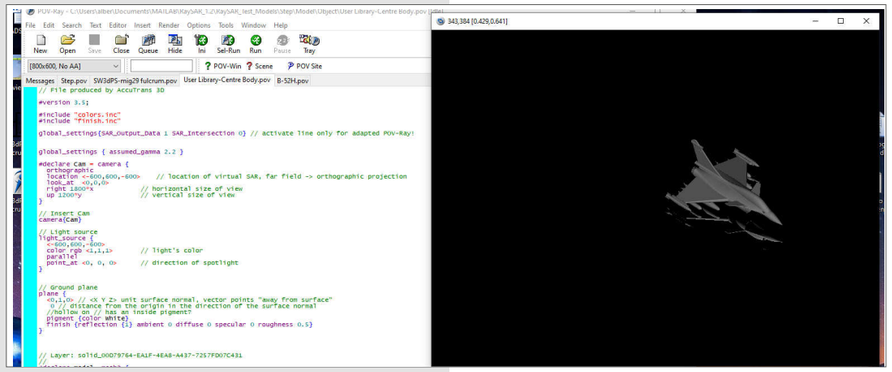
Task 2:
- Identification, selection and collection of 3D geometric models of the targets of interest both open source and from commercial suppliers.

Task 3:
- Management, adaptation and conversion of 3D geometric models as input from the SAR simulator.

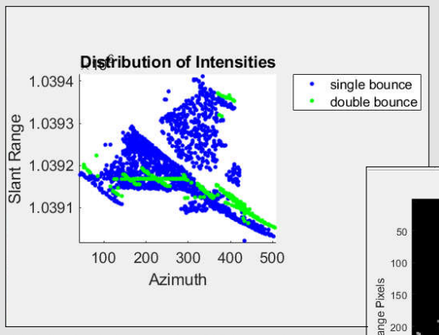
Task 4:
- Generation of SAR signatures

Task 5:
- Contribution to the project documentation relating to the SAR signature simulator.

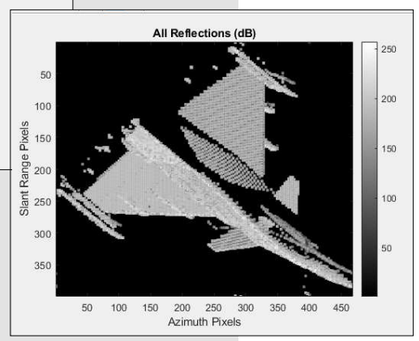
Technical Sheet
Funding institution:
E-GEOS S.p.a
Project partners
E-GEOS S.p.a
Project duration
February 2021 - February 2022
Involved countries
Italy



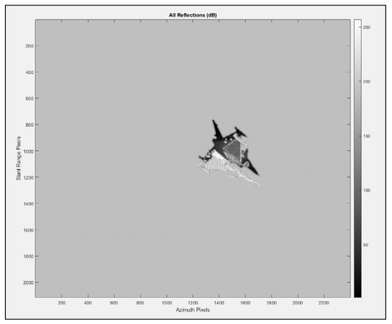
(a) Ray - raytracing simulation environment



(b) Reflection behaviour after SAR image simulation



(c) Simulated intensity of SAR image



(d) Simulation of SAR image in presence of clutter