

CEA LIST

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Targeted topics

SU-BES02-2018-2019-2020	Technologies to enhance border and external security Sub-topic 3: [2019] Security on-board passenger ships Sub-topic 4: [2019] Detecting threats in the stream of commerce without disrupting business	RIA IA
SU-DRS04-2019-2020	Chemical, biological, radiological and nuclear (CBRN) cluster	RIA IA

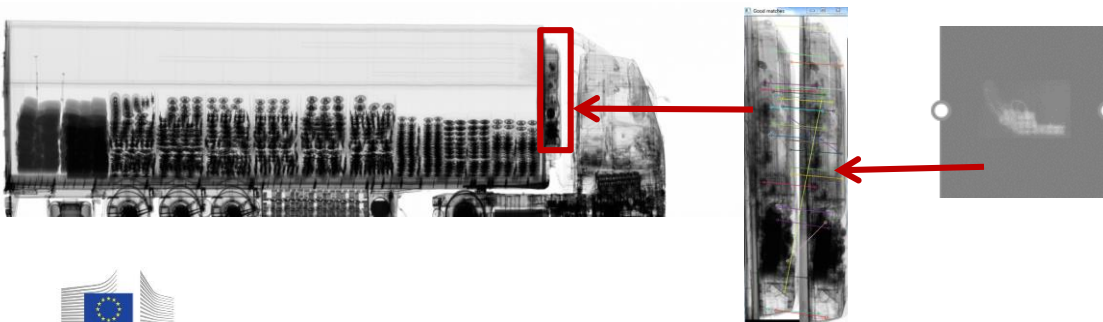
- *CEA LIST transfers scientific knowledge and innovation « from research to industry ». Security is one major industrial application.*
- *CEA LIST recent projects on Security calls:*
 - ✓ ACXIS, Research on Automated Comparison of X-ray Images for cargo Scanning
 - ✓ CBORD, Effective Contrainer Inspection at Border Control Points
 - ✓ BODEGA, Proactive Enhancement of Human Performance in Border Control
 - ✓ VESSEDIA, Verification Engineering of Safety and SEcurity critical dynamic Industrial Applications
 - ✓ KONFIDO, Secure and Trusted Paradigm for Interoperable eHealth Services.
- *DISC-Department Simulation, Imaging and Inspection*
 - ***Simulation and Imaging** based on developed CIVA platform widely used in Non-Destructive Testing for energy (nuclear, renewables), transport (air, rail, naval) and civil engineering.*
 - *Instrumentation (**X-Ray imaging**, UT, ECT)*
 - *New **Methods** (equipment and algorithms) **for automated monitoring and analyses.***

• SU-BES02-2018-2019-2020: Technologies to enhance border and external security

Proposals should target the automation and integration of existing technologies for the purpose of identifying the largest possible amount of threat materials and ensuring the full supervision of the logistic flow of goods.

Proposal:

- Multi-view scanners replacing 2D Scanners for goods (container and hand luggage)
 - Advance algorithm capable of reconstructing CT images from limited number of projections;
 - Fast reconstruction algorithms;
 - Statistical detection of flaws;
 - Simulation of database of reference threats, with their 3D envelopes;
 - Different level and focus implemented in the Machine learning methods for the risk assessment and decision making according to a previous risk evaluation;
- 3D scanners for hand luggage
 - Same steps as for multi-view scanners envisaged.
 - A specific focus on new threats (e.g. laptops and additive manufacturing technologies)



Example of automatic weapon detection in a fridge module of a container in ACXIS project.

- ✓ Algorithms to support border guard
- ✓ Reference database created
- ✓ Training software platform