The Future of Space Security Research

... + Maritime Security
+ Critical Infrastructure Protection

Harm Greidanus

Defence & Dual-Use Technologies 2018, Sevilla, 3-4 Oct 2018
The Joint Research Centre (JRC)
The science and knowledge service of the European Commission supporting EU policies with independent evidence throughout the whole policy cycle.
Contents

1. Landscape Study Space & Security
2. Support to Space & Security R&D Planning
3. Maritime Security Civ-Mil R&D
4. Critical Infrastructure Protection

Context:

Better coordination of R&D between civil and defence
1. Landscape Study Space & Security

Increasing relevance at EU level of

• Security
• Defence
• Space

Newly proposed EU Space Program 2021-2027

1. Earth observation (Copernicus)
2. Navigation (Galileo, EGNOS)
3. Space Situational Awareness (object tracking, space weather)
4. GOVSATCOM

+ Access to space; Support to start-ups; Security
Landscape study contents

An overview of current
• Regulations, policies, strategies
• Stakeholders
• Capabilities
• R&D projects
→ Gaps → R&D

EU level + 8 States
• FR, GE, IT, UK, ES, BE, SW, NO

Carried out under contract by Eridanis (FR) (Jan-Sep 2018)
OECD: The Space Economy at a Glance 2014

2.2. Civil space budgets in GBAORD, 2013

Space budget 2013 in USD

Source: OECD Main Science and Technology Indicators Database.

EU-level + 8 States
Landscape study output

• Report
• Excel sheets
  • 116 EU policies
  • 152 National policies
  • 227 Stakeholders
  • 221 Capabilities
  • 336 R&D projects
<table>
<thead>
<tr>
<th>Title</th>
<th>Type</th>
<th>Issuer</th>
<th>Date</th>
<th>Reference number</th>
<th>High level description</th>
<th>Web link to full text</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Defence Action Plan</td>
<td>COM</td>
<td>COM</td>
<td>30/11/16</td>
<td>COM(2016) 550</td>
<td>The European Defence Action Plan has specific goals to foster a stronger defence industry in Europe, and to support security-related research and development through a single European programme.</td>
<td><a href="http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2016:550:FIN">http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2016:550:FIN</a></td>
<td>1</td>
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<tr>
<td>Towards Space 4.0 for a United Space in Europe</td>
<td>DEC</td>
<td>COU</td>
<td>02/12/16</td>
<td>None</td>
<td>The decision calls for the realization of a single European space policy by 2020, guided by a long-term strategy and an annual space policy.</td>
<td><a href="http://espace.jrc.ec.europa.eu/docs/for_public_relations_eu_space_cm-16_resolutions_and_observations.pdf">http://espace.jrc.ec.europa.eu/docs/for_public_relations_eu_space_cm-16_resolutions_and_observations.pdf</a></td>
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<tr>
<td>European Council Conclusions on Security and Defence</td>
<td>CCL</td>
<td>EurC</td>
<td>15/12/16</td>
<td>EU(2016) 34/16</td>
<td>The report on the conclusions of the European Council on Security and Defence stresses the need for a comprehensive approach to security issues in Europe.</td>
<td><a href="http://data.consilium.europa.eu/doc/document/ST-38-2010-re.pdf?language=en-pdf">http://data.consilium.europa.eu/doc/document/ST-38-2010-re.pdf?language=en-pdf</a></td>
<td>2</td>
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<tr>
<td>Council conclusions on Security and Defence in the context of the EU</td>
<td>CCL</td>
<td>COU</td>
<td>18/05/17</td>
<td>9178/1</td>
<td>The report on the council conclusions on security and defence in the context of the EU highlights the need for a comprehensive approach to security and defence.</td>
<td><a href="http://www.consilium.europa.eu/media/2013/10/017/2013.Downloads.pdf">http://www.consilium.europa.eu/media/2013/10/017/2013.Downloads.pdf</a></td>
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<tr>
<td>Council Decision establishing Permanent Structured Cooperation (PESCO) and determining the list of participating States</td>
<td>CCL</td>
<td>COM</td>
<td>08/12/17</td>
<td>1400/17</td>
<td>The council decision creates a framework for closer cooperation between 25 European countries in the field of security and defence.</td>
<td><a href="http://www.consilium.europa.eu/media/32980/11462781707.pdf">http://www.consilium.europa.eu/media/32980/11462781707.pdf</a></td>
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<td>Type</td>
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<td>137</td>
<td>Industry for defence and a prosperous Britain: refreshing defence industrial policy</td>
<td>N/A</td>
<td>POL</td>
<td>Ministry of Defence</td>
<td>29/12/2017</td>
<td>None</td>
<td>1</td>
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<tr>
<td>139</td>
<td>Regeringens declaration</td>
<td>The Government’s Statement of Foreign Policy 2018</td>
<td>OTH</td>
<td>Minister for Foreign Affairs, Margot Wallström</td>
<td>14/02/2018</td>
<td>None</td>
<td>1</td>
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<td>140</td>
<td>Code de la défense</td>
<td>Defence Code</td>
<td>LAW</td>
<td>President of the Republic</td>
<td>01/03/2018</td>
<td>None</td>
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<tr>
<td>141</td>
<td>The Swedish Government’s overall EU priorities for 2018</td>
<td>N/A</td>
<td>STR</td>
<td>Prime Minister’s Office</td>
<td>02/03/2018</td>
<td>None</td>
<td>1</td>
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<td>142</td>
<td>Code de la sécurité intérieure</td>
<td>Internal Security Code</td>
<td>LAW</td>
<td>President of the Republic</td>
<td>10/03/2018</td>
<td>None</td>
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<td>143</td>
<td>GBR Space Industry Bill</td>
<td>N/A</td>
<td>LAW</td>
<td>Houses of Parliament</td>
<td>22/03/2018</td>
<td>None</td>
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<td></td>
<td>Geographic</td>
<td>Name</td>
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<td>CAT</td>
<td>High Level Description</td>
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<tr>
<td>128</td>
<td>AUS</td>
<td>Aeronautics and Space Agency</td>
<td>ALR</td>
<td>GOVP</td>
<td>Austrian space agency responsible for coordinating Austrian space exploration-related activities, both national programs and European Space Agency related programs. It was established in 1972 in Vienna</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>129</td>
<td>GBR</td>
<td>SIS Live</td>
<td>SI</td>
<td>INDB</td>
<td>SIS Live is Europe's largest uplink supplier and delivers 80% of the UK's live news contribution feeds. The company also manufactures personal satellite uplinks for use by lone reporters in areas of poor connectivity</td>
<td>272</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>EU</td>
<td>European Maritime Safety Agency</td>
<td>EMSA</td>
<td>GOVP</td>
<td>Provides technical expertise and operational assistance to improve maritime safety, pollution preparedness and response and maritime security. Also offers maritime services such as earth observation</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>131</td>
<td>AUS</td>
<td>Austrian Research Promotion Agency</td>
<td>FFG</td>
<td>GOVP</td>
<td>The Austrian Research Promotion Agency was founded in September 2004 as the central Austrian organisation for promotion of research and innovation. One of their priority is related to Austrian Space Programme</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>HUN</td>
<td>Hungarian Space Office</td>
<td>HSO</td>
<td>GOVP</td>
<td>The focus is utilisation of space technology for further applications including navigation, telecommunication, earth observation and information applications</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>133</td>
<td>DEU</td>
<td>Joint Counter Terrorism Centre</td>
<td>GTAZ</td>
<td>GRPG</td>
<td>Joint co-operation and communication platform used by 40 internal security agencies with the aim of fighting terrorism</td>
<td>229</td>
<td></td>
</tr>
<tr>
<td>134</td>
<td>DEU</td>
<td>Institute for High Frequency Physics and Radar Techniques</td>
<td>FHR</td>
<td>INS</td>
<td>FHR focuses on the fine-tuning of existing radar systems and the development of ground-breaking new radar technology</td>
<td>221</td>
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<tr>
<td>135</td>
<td>EU</td>
<td>DG Climate Action</td>
<td>CLIMA</td>
<td>GOVC</td>
<td>Commission department responsible for EU policy on climate action and leads international climate negotiations for the EU. Established in 1866, the Society has been at the forefront of developments in aerospace and climate science</td>
<td>220</td>
<td></td>
</tr>
<tr>
<td>National</td>
<td>Name</td>
<td>Acronym</td>
<td>Type</td>
<td>High Level Description</td>
<td>Owner</td>
<td>Cat. of Owners</td>
<td>Main Stakeholders Concerned</td>
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<tr>
<td>DEU</td>
<td>TanDEM-X</td>
<td>TanDEM-X</td>
<td>Service</td>
<td>TanDEM-X is the name of TerraSAR-X’s twin satellite, a German Earth observation satellite using SAR (Synthetic Aperture Radar) - a modern radar imaging technology, implemented in a Public-Private Partnership between the German Aerospace Centre (DFRL) and EADS Astrium (now Airbus Defence and Space). It is, in second, almost identical spacecraft to TerraSAR-X. The unique two-satellite constellation will allow the generation of the WorldDEM™, the seamless global digital elevation models of the world with an</td>
<td>DUR</td>
<td>GOV</td>
<td>1</td>
</tr>
<tr>
<td>DEU</td>
<td>SATCOMBv</td>
<td>SATCOMBv</td>
<td>Service</td>
<td>SATCOMBv satellite-based communication system is developed to meet the requirements of the German Armed Forces (Bundeswehr), it consists of two multi-mission military communications satellites, namely COMSAT-1 and COMSAT-2. The multi-mission satellites facilitate reliable and secure communications between the military authorities, government and armed forces deployed globally, from the Americas to Eastern Asia. Their applications include voice, fax, database access, video and multimedia</td>
<td>German Federal Ministry of Defence</td>
<td>GOV</td>
<td>1</td>
</tr>
<tr>
<td>DEU</td>
<td>Tracking &amp; Imaging Radar System</td>
<td>TIRA</td>
<td>Service</td>
<td>TIRA system serves as the central experimental facility for the development and investigation of radar techniques for the detection and reconnaissance of objects in space, and to a certain degree also of air targets. TIRA has a 54-metre parabolical antenna, a monopulse radar operating at 1.330 GHz or 22.5 cm (L-band) and 16.7 GHz or 1.8 cm (Ku-band) wavelengths. The L-band is usually used for tracking debris with a 0.45° beam width, at 1 MW peak power</td>
<td>Fraunhofer</td>
<td>INS</td>
<td>1</td>
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<tr>
<td>DEU</td>
<td>User Interface Earth Observation on the WEB &amp; GeoPortal</td>
<td>EOWEB</td>
<td>Service</td>
<td>It provides access to German Remote Sensing Data Center (DFD) earth observation data. Registered users can search for catalogue data, view browse images, order data, and order future acquisitions</td>
<td>DUR</td>
<td>GOV</td>
<td>1</td>
</tr>
<tr>
<td>Nationality</td>
<td>Title original</td>
<td>Title translation</td>
<td>Acronym</td>
<td>Type</td>
<td>Objectives</td>
<td>Status</td>
<td>Funding source</td>
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<tr>
<td>EU</td>
<td>Through-foliage detection, including in the outermost regions of the EU</td>
<td>Through-foliage detection, including in the outermost regions of the EU</td>
<td>FOLOUT</td>
<td>Demonstrator</td>
<td>foremost regions of the EU. Foilage penetration is an unsolved important part of border surveillance. By solving the problem of unreliable detections in such harsh environments border guards’ workloads are reduced, costs are reduced and, last but not least, lives can be saved. Detecting people through dense foliage in extreme climates with only a penetration technology is prone to high fault rates. FOLOUT will build a system that combines various sensors and technologies and intelligently fuses these into an effective and robust intelligent detection platform. Fusing several sensor signals increases</td>
<td>on-going</td>
<td>H2020</td>
</tr>
<tr>
<td>FRA</td>
<td>Future Advanced Satellite Telecommunications</td>
<td>Future Advanced Satellite Telecommunications</td>
<td>FAST</td>
<td>New Capability</td>
<td>The FAST project amounts to the development of third-generation digital processors to be used on civilian and military telecommunication satellites. FAST processors will become a key component in telecommunication satellites and embody a remarkable leap forward in terms of performance, thanks to a modular design and increased digital processing capabilities in on-board processor bandwidth from a few Gz to a few dozen Gz. These processors will also be flexible, able to switch frequencies and interconnect between the various beams being processed by the payload. These are crucial features when it comes to connecting military users located in different theatres of operations or avoiding interference in communication bands. The FAST processors will be the core of the Syracuse-4 military telecommunication satellites</td>
<td>on-going</td>
<td>CNES</td>
</tr>
<tr>
<td>SWE</td>
<td>SPHINX</td>
<td>SPHINX</td>
<td>SPHINX</td>
<td>Mission</td>
<td>SPHINX mission is to study the hard X-ray polarization of gamma-ray bursts. The scientific goal is to measure the polarization of GRBs (Gamma-Ray Bursts), which builds on the research undertaken within ProSOLite and the Fermi project</td>
<td>on-going</td>
<td>Swedish National Space Board</td>
</tr>
<tr>
<td>SWE</td>
<td>Rynd- och missilfrågor</td>
<td>Space Matters</td>
<td>None</td>
<td>Several</td>
<td>Research into propulsion systems and combustion systems and rockets; laser and radar systems and antennas; synthetic aperture radar and its applications; atmospheric measurements which are supplemented with satellite data for climate studies and mapping; development of radio antennas for satellites; and use of GPS equipment and into the sensitivity of satellite navigation systems to interference</td>
<td>on-going</td>
<td>Swedish Armed Forces</td>
</tr>
</tbody>
</table>
Recurring themes in policies

EU POLICY & REGULATION
116 relevant documents

SPACE
- Maximise space benefits for society
- Reinforce synergies between civil and defence
- Improve dual-use operational capacity
- Enhance existing EU capabilities in space for security and defence
- Further use and integration of space assets for security
- Advanced EU space programs and meet user needs
- Holistic approach to space sector
- Investment in launch capabilities
- Support space innovation and entrepreneurship
- Encourage the use of space services and standardisation measures
- Strengthen the conflict prevention objective of space capabilities

SECURITY
- Maintain and reinforce Europe’s autonomy
- Strengthen Europe’s role as global actor and promote international cooperation
- Further use and integration of space assets for security
- Promote the autonomy and security of EU space-based services
- Ensure the protection and resilience of critical European space infrastructures
- Enhance existing EU capabilities in space for security and defence
- Support space innovation and entrepreneurship
- Encourage the use of space services and standardisation measures
- Invest in launch capabilities
- Holistic approach to space sector
- Advance EU space programs and meet user needs

Support space innovation and entrepreneurship
Reminder: Copernicus
EU’s Earth Observation program

• Satellites: data
  • EU’s own Sentinels 1-6
  • Buy data from non-EU satellites + non-space data

• Services: derived products
  • Land, Marine, Atmosphere, Climate, Emergencies
  • Security
    • Maritime
    • Border
    • External action

web: copernicus.eu
<table>
<thead>
<tr>
<th>Requirements relevant to Copernicus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate Monitor.</strong></td>
</tr>
<tr>
<td>#Long-term observations for climate change mitigation and adaptation</td>
</tr>
<tr>
<td>#Development of downstream environmental applications and forecasts</td>
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<tr>
<td><strong>Border &amp; Land Surv.</strong></td>
</tr>
<tr>
<td>#Surveillance of all borders</td>
</tr>
<tr>
<td>#Monitoring of goods</td>
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<tr>
<td>#Monitoring of assets</td>
</tr>
<tr>
<td><strong>HUM Aid Support</strong></td>
</tr>
<tr>
<td>#Monitor hazards &amp; critical events 24/7</td>
</tr>
<tr>
<td>#Collect &amp; analyse real-time information on emergency &amp; crisis</td>
</tr>
<tr>
<td>#Support for deployment planning</td>
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<tr>
<td>#Humanitarian telemedicine</td>
</tr>
<tr>
<td><strong>Civil Protection</strong></td>
</tr>
<tr>
<td>#Support for deployment of civil protection teams/ module</td>
</tr>
<tr>
<td>#Support for rapid and effective response &amp; rescue operations</td>
</tr>
<tr>
<td>#Support for risk assessment and mapping</td>
</tr>
<tr>
<td><strong>Maritime Surveillance</strong></td>
</tr>
<tr>
<td>#Surveillance for maritime safety</td>
</tr>
<tr>
<td>#Surveillance &amp; mitigation of illegal sea activities</td>
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<tr>
<td>#Monitoring and control of fisheries</td>
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<tr>
<td><strong>Military Ops Support</strong></td>
</tr>
<tr>
<td>#Increase situational awareness including early warning</td>
</tr>
<tr>
<td>#Support for land and sea warfare</td>
</tr>
<tr>
<td>#Support military planning</td>
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<tr>
<td><strong>Space INF Protection</strong></td>
</tr>
<tr>
<td>#Increase physical protection and resilience</td>
</tr>
<tr>
<td>#Ensure ensuring continuously ensuring availability of services</td>
</tr>
<tr>
<td><strong>Law Enforc. Support</strong></td>
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<tr>
<td>#Surveillance against international drug &amp; organised crime</td>
</tr>
<tr>
<td>#Support for policing tasks (e.g. safety checks, traffic controls)</td>
</tr>
<tr>
<td>#Support for penal law enforcement and crime investigation</td>
</tr>
<tr>
<td>#Support for public order &amp; offender management</td>
</tr>
</tbody>
</table>
R&D activities relevant for above requirements

**Much R&D**
- R&D activities tend to focus at EU level
- Earth observation and climate & environment monitoring tend to attract R&D efforts
- Navigation is also well funded

**Some R&D**
- There are several R&D activities focusing on secure and integrated communication, civil protection management, maritime surveillance, geo-intelligence, and SSA

**Little R&D**
- R&D activities for law enforcement, cyber security, space infrastructure protection, border & land surveillance, and humanitarian aid appear limited

336 R&D activities were reviewed
For defence, only publically available R&D efforts could be reviewed
### Key capability gaps as flagged by the Eridanis study

<table>
<thead>
<tr>
<th>Gap</th>
<th>Title</th>
<th>Explanation</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td><strong>Cybersecurity capabilities tailored for space infrastructures</strong></td>
<td>Limited number of existing space and/or cyber security capabilities and R&amp;D activities in Europe directly addressing space infrastructures and the challenges created by the meshing of space and cyberspace</td>
<td>For all connected space infrastructures and services</td>
</tr>
<tr>
<td>G2</td>
<td><strong>Space capabilities for law enforcement and new emerging security domains</strong></td>
<td>Limited number of EU capabilities and R&amp;D activities addressing new emerging security areas, such as law enforcement</td>
<td>Both ground and space segment</td>
</tr>
<tr>
<td>G3</td>
<td><strong>Security by design space enabled capabilities covering the entire space asset life-cycle</strong></td>
<td>Limitation in the security design of existing space infrastructures and their ability to withstand the harmful impact of unexpected negative events</td>
<td>Both ground and space segment</td>
</tr>
<tr>
<td>G4</td>
<td><strong>Space enabled capabilities closely aligned to the different operational requirements of a wide and diverse security communities</strong></td>
<td>Lack of security domain specific applications and services to support the operation of the different stakeholder groups comprising the security communities</td>
<td>Both ground and space segment</td>
</tr>
<tr>
<td>G5</td>
<td><strong>Fully integrated SSA capability at the EU and global level</strong></td>
<td>Lack of a global system or global system of systems for SSA</td>
<td>Space segment</td>
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</table>

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<thead>
<tr>
<th>Gap</th>
<th>Title</th>
<th>Explanation</th>
<th>Relevance</th>
</tr>
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<tbody>
<tr>
<td>G6</td>
<td><strong>Enhanced SST capabilities covering debris management, natural occurring objects and tracking in deep space</strong></td>
<td>Limited SST capabilities addressing debris management, natural occurring objects and tracking in deep space</td>
<td>Space segment</td>
</tr>
<tr>
<td>G7</td>
<td><strong>Capabilities in geo-intelligence and data integration</strong></td>
<td>Limited number of capabilities related to the integration of multiple satellite and other data sources and the intelligence exploitation of all forms of satellite and other imagery for security purpose</td>
<td>Both ground and space segment</td>
</tr>
<tr>
<td>G8</td>
<td><strong>More advanced secure satcom addressing emerging threats and needs</strong></td>
<td>Limited ability of existing satcom capabilities to address the different needs of all the key security stakeholder groups</td>
<td>Both ground and space segment</td>
</tr>
<tr>
<td>G9</td>
<td><strong>Global coverage of Copernicus and Galileo</strong></td>
<td>Still limited coverage offered by Copernicus and Galileo (i.e. anywhere)</td>
<td>Both ground and space segment</td>
</tr>
</tbody>
</table>
2. Support to Space & Security R&D Planning

Considering

• Security applications of space
• Our dependence on space assets → Need to secure them
• Integrated EU Space Program
• Diverse funding opportunities for R&D

→ Better align R&D planning across funding programs and across the parts of the space program
→ Potential dual-use synergies
Space in Horizon Europe (2021-2027)

Horizon Europe will have 3 pillars:

1. **Global Challenges and Industrial Competitiveness**
   - ✔ Dedicated intervention area "Space" in Digital and Industry cluster
   - ✔ Also in other clusters

2. **Open Science**
   - ✔

3. **Open Innovation**
   - ✔
Workshops “The Future of Space Security Research”

EU Space Program
- Copernicus
- Galileo
- EGNOS
- GOVSATCOM
- Space Situational Awareness

Formal programming
- MS Delegates
- FP Calls
- Committees

R&D projects
- FP7, H2020, HE
- National Pre-Action Defence Research, European Defence Fund
- EU other (DGs, Agencies, Regional, ...)

Workshops “The Future of Space Security Research”
- General: 22 June 2018
- Copernicus: 23 Oct 2018
- ... TBD ...: 2019

R&D results (on security)

• EU Maritime Security Strategy June 2014
• Action Plan (Dec 2014)
  • One action on a joint civil-military research agenda for maritime security
  ➢ Concluded end 2017 by European Commission, EEAS, European Defence Agency, Member States, Industry
• Supported by Council conclusions 26 June 2018
Why a civil-military research agenda for maritime security? (MRA)

- Civil and military actors find large overlaps in their requirements related to maritime security
  - Navies perform many civilian tasks (non-warfighting)
- Commercial product development overtakes military product development
- We have civil and military R&D funding streams
- Synergies in R&D will lead to cost saving and/or better products

(Still, civil-military has sensitivities)
The structure of the MRA

• Not detailed, but high-level aggregated
• A list of 9 main topics
  • Aimed at useful grouping, not fully non-overlapping
• For each topic:
  • Why
  • State of the art
  • What to do
  • How to implement (suggested actions)
  • 1-2 pages of text
The main topics of the MRA

1. Maritime surveillance – Concepts, systems, sensors, platforms
2. Interoperability, Information sharing and Cybersecurity
3. Environmental compliance, Energy and Life cycle
4. Decision support systems
5. Port and sensitive area protection
6. Autonomous systems, Networking and Communications
7. Sensor allocation and Modelling
8. Maritime security studies
9. Multi-purpose platforms
MRA Main topic
• One example

1. Maritime surveillance – Concepts, systems, sensors, platforms
   • Abnormal behaviour detection with AI methods

2. Interoperability, Information sharing & Cybersecurity
   • (Soft) standards – for data; for RPAS payloads

3. Environmental compliance, Energy & Life cycle
   • Zero-emission / renewable fuel ship

4. Decision support systems
   • Use of AI in decision support systems

5. Port and sensitive area protection
   • Network of heterogeneous distributed sensors for port protection
MRA Main topic
• One example

6. Autonomous systems, Networking & Communications
   • Concepts of operations with autonomous platforms, including integrity, trust & liability

7. Sensor allocation and Modelling
   • Modelling & Simulation of the Systems of Systems used for maritime surveillance – design, operational planning & training

8. Maritime security studies
   • Facilitate access to existing (national) maritime security studies in one place by an indexing effort

9. Multi-purpose platforms
   • Optional engagement capabilities in a modular dual-use platform
The nature and use of the MRA

• Shared awareness, ideas and indications
  • Not all content is agreed by all
  • Not prescriptive
• For use by all stakeholders in ongoing / future planning of security research
  • H2020, HE
  • EDA CapTechs
  • Future EU Defence Research, current Preparatory Action
  • MS research programs
• MRA retained in updated action plan → Future updates
ERNCIP: European Reference Network for Critical Infrastructure Protection

• Large network of experts
• Improve availability of security solutions
• Common European testing standards, methodologies and protocols
The ERNCIP Thematic Groups of experts under the mandate of MS, DG HOME, JRC produce Standards, best practices, guidelines & reference documents also relevant to Dual-use

https://erncip-project.jrc.ec.europa.eu/
ERNCIP thematic groups on CBRNE

- Detection of explosives & weapons at secure locations
  Mitigating the threat of explosives and weapons attacks.

- Chemical and Biological (CB) risks to drinking water
  Early warning system for detection of CB contaminants.

- Detection of indoor airborne CB agents
  Scenarios and next generation of detectors.

- Radiological and nuclear threats to critical infrastructure
  Common standards for data acquisition, and sampling using unmanned vehicles.

➤ Can point to dual-use R&D requirements
Conclusion

- More efficient allocation of R&D budgets between civilian and defence programs
- Opportunities for dual-use R&D projects

*With mechanisms for the areas*
- Space & Security *(Landscape study, Workshop series)*
- Maritime Security *(Civ-Mil Research Agenda)*
- Critical Infrastructure Protection *(ERNCIP network)*
Thank you

Any questions?

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