

# ASSETS<sup>+</sup>

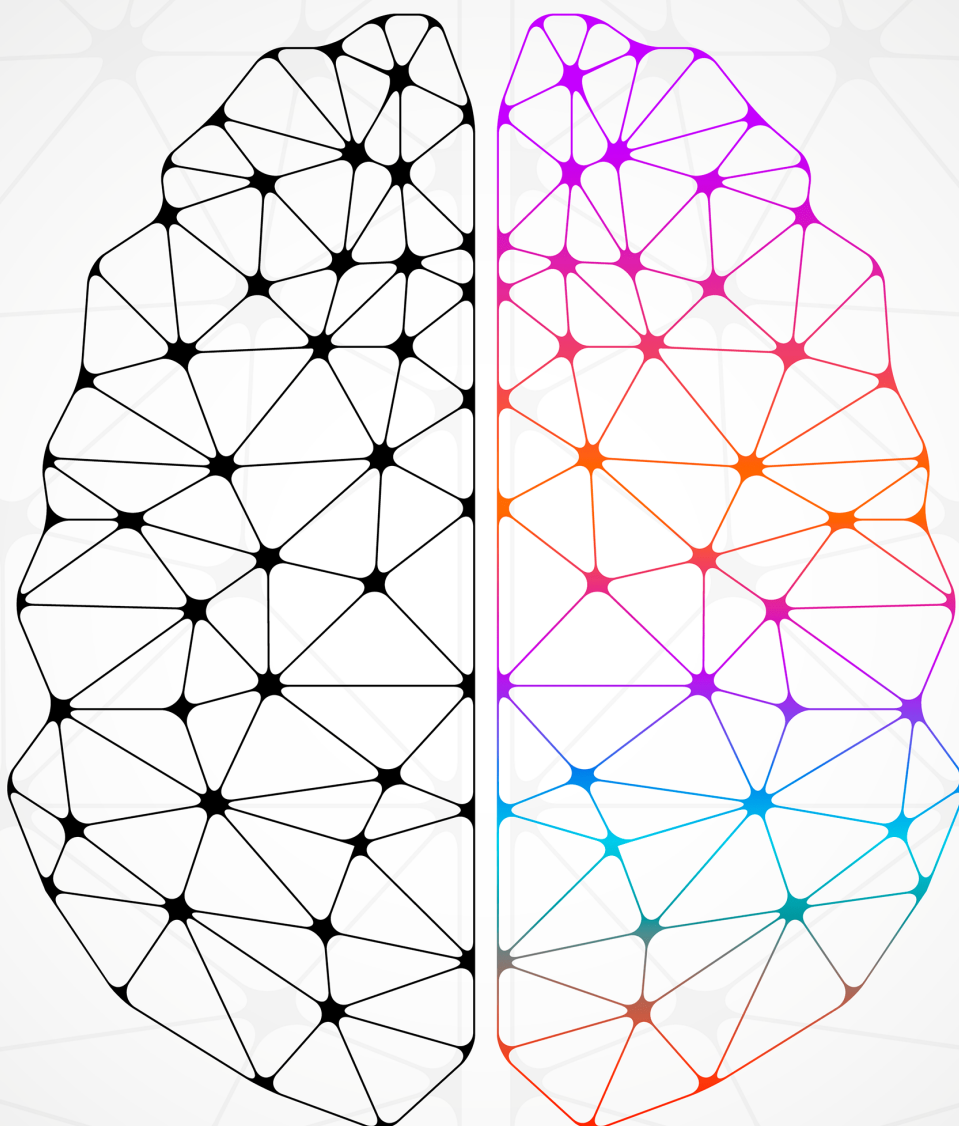
Alliance for Strategic Skills addressing Emerging Technologies in Defence

## Alliance for Strategic Skills addressing Emerging Technologies in Defence

Working to build a sustainable human resources  
supply chain for the European Defence Industry



Co-funded by the  
Erasmus+ Programme  
of the European Union



Currently, more than three-quarters of companies in the European Union report difficulties in finding workers with the necessary skills, while only 37% of adults participate in regular training. The Defence sector is no exception to this trend. The rapid pace of technological evolution is drastically changing the labour market.

Developing educational content for the workforce of the near future is essential.

Furthermore, many misconceptions surround defence activities; however, this industry consistently operates at the forefront of innovation, offering the most advanced technologies and a highly international and multidisciplinary environment.

The ASSETs+ project aims to dispel the myths and biases associated with the defence sector while designing new courses and challenges that effectively capture students' attention.

# What is ASSETs+

The **Alliance for Strategic Skills addressing Emerging Technologies in Defence** (ASSETs+) was launched in January 2020, for a four-year period.

ASSETs+ is an **Erasmus+ project**, the European Union's programme to support education, training, youth and sport in Europe.

Coordinated by the **University of Pisa** (Italy), the project is built on close collaboration between the Defence Industry, sectoral organizations, Higher Education Institutions, Vocational Education and Training providers and research centres, with 30 partners from 8 countries and a broad ecosystem of stakeholders.

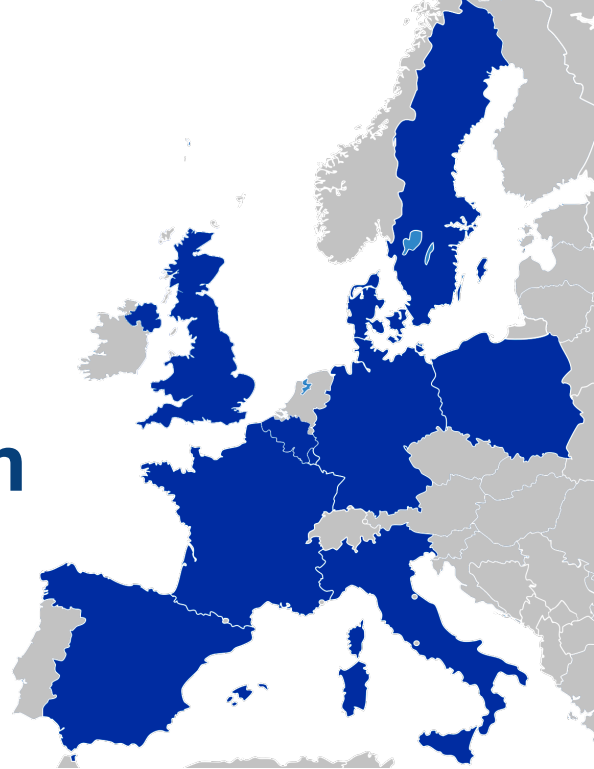


## PACT FOR SKILLS

## ASSETs+ is member of the Pact For Skills

a shared engagement model for skills development in Europe, whose objective is the development of competences and abilities, thus taking on, together with other participating actors, a key role in the action of European social policies.

# 30 Consortium Partners



ASSOCIATED PARTNERS:







# ASSETs+ employs a blended, iterative approach that integrates data-driven analysis with human expertise

ASSETs+ aims to build a sustainable human resources supply chain for the European Defence Industry, that boosts innovation by both attracting highly-skilled young workers and upskilling its employees.

## Core activities of the project:

- Develop a **Defence Technology Roadmap**, mapping key enabling technologies and defence-related applications. This activity entails:
  1. conducting a big data analysis of technical and scientific documents on skills for emerging technologies in defence, which will inform the design of education and training programmes;
  2. organising holistic and future-oriented brainstorming sessions, leveraging the expertise of our partners;
  3. obtaining validation from industry experts to ensure alignment with the sector's needs; and
  4. performing annual iterations to monitor current skillsets and identify emerging ones.
- Create a **Skills Blueprint**, classifying skills and job profiles for Defence technologies.
- Establish a **Body of Knowledge**, featuring an ontology of technologies, skills, knowledge, and jobs for defence.
- Develop a **Strategy for developing human resources in the Defence sector**, including an action plan on skills to enhance EU Defence capabilities.
- Design **education and training programmes**, by incorporating a pedagogical and technical framework for courses on Defence technologies.
- Develop education and training **prototype programmes** to ensure the advancement of human resources for Defence.

# Technology & skills analysis

The analysis carried out within the context of the ASSETs+ project focuses on three primary technological areas in the defence sector:

- Robotics, Artificial Intelligence, and Autonomous Systems;
- C4ISTAR;
- Cyber Security.

The results are derived from an extensive process of data integration, incorporating information gathered through data-driven analysis, brainstorming sessions, project reviews, and validation from industry experts.

The work was also complemented by additional in-depth analyses on roadmapping. Subsequently, the insights gathered led the team to develop professional profiles related to the defence sector that can be incorporated within the European Classification of competencies and occupations.

Lastly, relevant defence-related projects and initiatives at European, national, and regional levels have been monitored and mapped to provide an overview of skills development activities in the defence sector.

## Data Collection

~300k

technical and scientific documents on technologies and skills related to the Defence sector and the emerging technological domains in analysis

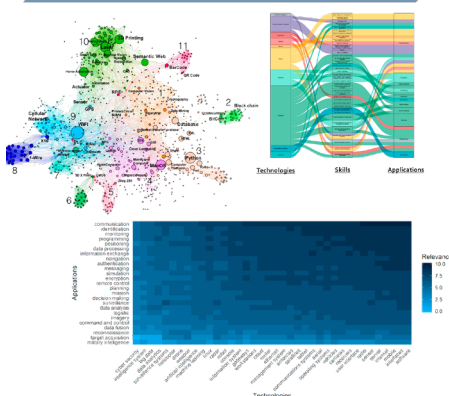


## Information Extraction

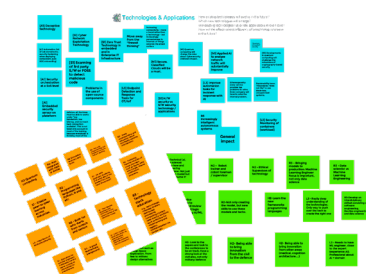
Extraction of key information from the collected documents, including technologies, skills, and applications, using natural language processing and machine learning techniques.



## Knowledge & Relations Analysis



## Foresight with Experts



# Job Profiles, Skills and Technologies Roadmapping

## Capability Driven Approach leveraging on Natural Language Processing & Human-in-the-Loop

## CAPABILITY AREA: Autonomous Systems

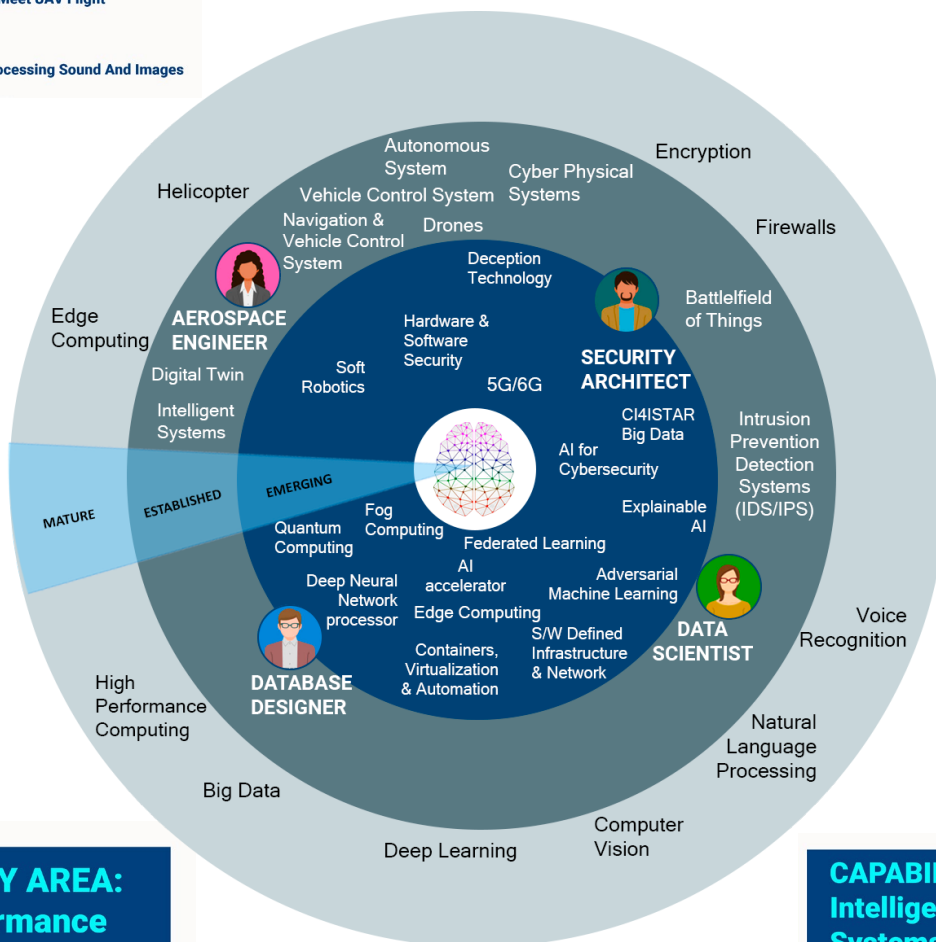
- Aircraft Mechanics
- Apply Reverse Engineering
- Assemble Robots
- Control Systems
- Create A Product's Virtual Model
- Design Smart Grids
- Embedded Systems
- Guidance, Navigation and Control
- Human-Robot Collaboration
- Operate Drones in Civil Engineering
- Perform Aircraft Maintenance
- Perform Smart Grid Feasibility Study
- Robot Programming
- Set Up Automotive Robot
- Systems Engineering including safety and security
- Undertake Procedures to Meet Helicopter Flight Requirements
- Undertake Procedures to Meet UAV Flight Requirements
- Unmanned Air Systems
- Upgrade Firmware
- Using Digital Tools For Processing Sound And Images

See the Roadmap  
on our [website](#).



## CAPABILITY AREA: Cybersecurity Systems

- Carry Out Research on Ground Systems
- Cyber Attack Counter-Measures
- Embedded Systems
- ICT Security Legislation
- Implement A Firewall
- Integrate System Components
- Manage Alarm System
- Manage Cloud Data and Storage
- Manage Keys for Data Protection
- Military Code
- Prepare and Apply Security Test Plans
- Secure Network Communications
- Teach Computer Science
- Use Reservoir Surveillance



**CAPABILITY AREA:**  
High Performance  
Computing Systems

- Analyse Big Data
- Artificial Neural Networks
- Computer Programming
- E-Learning Software Infrastructure
- Identify Data Supporting Strategies
- Real-time Computing
- Scientific Research Methodology
- Analyse Large-Scale Data in Healthcare
- Smart City Features

**CAPABILITY AREA:**  
Intelligent Information  
Systems

- Artificial Neural Networks
- Computer Vision
- Computing system architecture
- Control Panel Components
- Coordinate Technical Standards For Global Interoperability
- Design User Interface
- Develop Software Prototype
- Distributed Computing
- Electrical Machines
- Embedded real-time systems
- Guide Learners in Using Assistive Technologies
- Integration Of 5G/6G Services with Cloud Services
- Make Electrical Calculations
- Natural Language Processing
- Open Source Management
- Power Engineering



TRAINING

DEVELOPMENT

SKILLS

# Education & Training

ASSETs+ has designed education & training programmes to provide trainees with new skills related to key technologies that will be expected in the Defence sector in the coming years, most notably:



**ARTIFICIAL  
INTELLIGENCE**



**ROBOTICS**



**C4ISTAR**



**CYBERSECURITY**

The ASSETs+ courses are built on active pedagogical approaches like project-based learning, summer schools, challenges, e-learning.

They are focused on professionals (Defence & AeroSpace) as well as undergraduate and graduate students.

An e-learning program “Train the Trainers” has also been designed, a free and open course that will allow trainers to cover different topics and to address students

from lower to higher education levels by applying a common methodology developed during the ASSETS+ Project and adjusted to the specificities and needs of the Defence sector.

The programme also includes a pedagogical approach and a guided tour of European tools such as ESCO.

See all the courses on our [website](#).



35

**courses  
implemented  
(2020-2023)**



over **1300**  
participants



From over **23**  
different countries





# ASSETs+ European Defence Challenge

**A great opportunity for students  
to boost their careers and open  
new horizons**

The ASSETs+ **European Defence Challenge** is an open competition to attract young talent to the Defence industry and to encourage them to initiate a career in defence-related technologies.

The topic is based on the emerging technologies and most in-demand skills, from a more technical and vertical perspective, to a more transversal one.

- **I EDITION 2020-2021:**

Which technologies and technology bricks are particularly relevant for Europe's sovereignty in defence and security?

- **II EDITION 2021-2022:**

Remote everything? To what extent can unmanned assets interact with humans in the field for defence operations?

- **III EDITION 2022-2023:**

Security – threats identification and defence strategies.

- **IV EDITION 2023:**

Leading through Complexity: Effective Management in Defence Environment.

**4 EDITIONS**

(2020-2024)



**577** students registered  
**416** participants



**24** countries



**126** institutions



**29** education & training seminars,  
webinars with Defence experts, public events



**44%**



**56%**



**55%** undergraduated

**45%** graduated

**AGE** **~23**

**7%** below 20



# Winners

## I EDITION

### FIRST POSITION

Emre Kursat & Miguel Garrido, College of Europe



### SECOND POSITION

Matěj Pastír & Radka Fléglová, Charles University



### THIRD POSITION

Marinette Gaillon & Auriane Georges, Science Po Lille



## II EDITION

### FIRST POSITION

Andreas Wouters & Nathan Prakopetz, Royal Military Academy Brussels



### FINALISTS

Susanna Hein & Emilien Maquaire, Sciences Po Lille



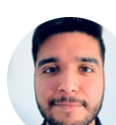
### FINALISTS

Anaëlle Salamo, Sciences Po Lille & Sinan Bekka, University of Edinburgh



### YOUNG STUDENT AWARD

Carlos Daniel Farias, University of Cadiz & Carlos Thurn, from Nordakademie



## III EDITION

### FIRST POSITION

Antoine Lebret & Sarah Joron, Sciences Po Lille



### SECOND POSITION

Stefan Ursu & Jan Beuchel, RWTH Aachen University



### THIRD POSITION

Antonio Ferrándiz & Jesús Eguino, Centro Universitario de la Guardia Civil – UC3M



### YOUNG STUDENT AWARD

Abigail Machaj & Alicja Siekanowicz, Rzeszów University of Technology



## IV EDITION

### FIRST POSITION

Camille Haaby, Bordeaux Institute of Technology, & Camille Stephan, Sciences Po Strasbourg



### SECOND POSITION

EX AEQUO  
Borre Van de walle & Lucie Vandemaele, KU Leuven



### SECOND POSITION

EX AEQUO  
Filip Kubik & Marcin Krysiak, Rzeszow University of Technology



### THIRD POSITION

Gian Marco Comparini & Pietro del Debbio, University of Pisa



# Join the ASSETs+ Network and become part of our ecosystem!

## Are you a Defence-related organisation or expert?

ASSETs+ primarily targets defence-related companies and defence industry representatives, individual experts and other stakeholders who have an interest in developing skills and competences in four main technologies: Artificial Intelligence, Robotics, C4ISTAR and Cybersecurity.

## Why should you join the ASSETs+ network?

- Enlarge your network in a prestigious context and enhance visibility
- Opportunity to participate in pilot implementations
- Attend the ASSETs+ courses free of charge
- Implement the ASSETs+ courses in your institution
- Develop new courses using the ASSETs+ methodology
- Help define the new ASSETs+ Sectoral Skills Strategy for the Defence sector
- Make connections and create meaningful information exchanges around the skills agenda of the Defence sector

## What is required of you?

- Voluntary involvement
- Engagement free of charge
- Optional participation in the online surveys, workshops and review of outcomes



**How to become part of the ASSETs+ ecosystem?**  
By simply filling out a 5 minute registration form  
on our [website](#).







@ASSETS\_Plus



@ASSETS+



ASSETS\_Plus\_EU

[www.assets-plus.eu](http://www.assets-plus.eu)



Co-funded by the  
Erasmus+ Programme  
of the European Union

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, therefore the Commission cannot be held responsible for any use which may be made of the information contained therein.