



# Get to know our ULTIMATE partners



**Łukasiewicz**  
PIAP

**Lukasiewicz Research Network – Industrial Research Institute for Automation and Measurements PIAP is a leading Polish research Institute, developing unique solutions in the field of industrial automation, ICT, security and defence technologies, mobile robotics and measuring devices.**

- **High quality solutions for over 50 years**

Łukasiewicz – PIAP provides Polish entities and foreign partners with the latest technologies in robotics, automation, measurement techniques and 3D printing, as well as Space technologies. They offer ULTIMATE a wide, interdisciplinary experience in the fields of: information technology, **industrial and mobile robotics**, industrial automation, security and defence, telemetry and telecommunication, **artificial intelligence** and measuring devices. Based on this experience, Łukasiewicz-PIAP participates in both R&D and commercial product and service development.

- **Manufacturing workstation with mobile robots**

Collaborative robotics are able to handle different parts in a workspace shared with humans. ULTIMATE Use Case will explore how to achieve **reliability and efficiency of robotic support through AI enhanced manufacturing** as the robot operation is oriented towards handling the material and parts needed by the worker without any damage nor losing time and waste increasing.

Łukasiewicz – PIAP is doing small batch productions of specialised mechanical and electrical components that are often modified in the design process for specific customer.

The manufacturing operations are usually simple: screwing, folding, mechanical assembly of parts and linking components and are done in given order by qualified staff.

Due to the specific small batch production the work is organised within 3 workstations and workflow is assigned to each of them, including division of tasks between the robots and humans.

- **A European Partner**

The Institute is also very active in **realisation and coordination of international and national multi-partner projects** and has a well-established cooperation within EC, NATO, EDA and ESA research programmes. Since April 2019 the Institute has been a part of **Łukasiewicz Research Network - the third largest research network in Europe** and a unique project of great commercial potential, providing attractive, comprehensive and competitive business solutions in the fields of automation, chemicals, biomedicine, ICT, materials, and advanced manufacturing.

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The **ULTIMATE Hybrid AI functionalities** are expected to provide the following improvements for the manufacturing process:

- Increased safety for human operator by allowing a precise risk analysis of the robotic system: detection and precise tracking of human operators – allowing to replan / stop / slow down the robot movement when human is approaching (human detection).
- Better human understanding of robotic actions and increased collaboration between the robot and human, for example during part handover (human detection, human action understanding).
- Better efficiency of the shopfloor.

The solution will be implemented based on freely available large image datasets for **training of human detector AI algorithms**.

State-of-the-Art human movement models will be used for Hybrid AI approach.

The robotic functionality is provided through ongoing H2020 projects APRIL and VOJEXT and will be integrated by Łukasiewicz – PIAP.



### OSB Team

Part of the Department for Intelligent Defence and Security Systems, its mission is to conduct the R&D and engineering activities, develop competencies and provide new technologies and solutions in the field of **cyber-physical systems** for application

in various areas, including manufacturing, inspection and maintenance, security and defence, logistics and Space. Team's research interests include also **social and ethical aspects of Human-Robot Interaction**.

### ULTIMATE Events

● 2<sup>nd</sup> of March 2023: 1st Clustering Event of Verifiable robustness, energy efficiency and transparency for Trustworthy AI (AI, Data and Robotics) projects.

● 16<sup>th</sup> of March 2023: ULTIMATE Website Launched - <https://ultimate-project.eu/>

### Next

● 19-30<sup>th</sup> June 2023 at KTH in Stockholm - PhD Summer School on Physics Informed Neural Networks

# ULTIMATE



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