



Łukasiewicz
PIAP

***ŁUKASIEWICZ-PIAP - Research and Development
Center for Automation and Robotization***

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Łukasiewicz-PIAP

RTO, system integrator, **mobile robots producer**, 300 workers.

Technology Centre: Robotics, Automation, CPS, IoT,
Edge computing

3D Scanning/Printing/Fast delivery of spare parts

Digital Innovation HUB. ADRA, INSIDE member.
EIT-ManufacturingHub Poland



Workshop Name



Competencies

1. Our main activities:

- **Automated and robotized** work centres and production lines.
- New generations of **control systems** and drives for modernized production installations.
- Industrial measurement systems.
- **3D** printing and scanning.
- Stations for visual inspection, monitoring and telemetry systems.
- Intelligent systems and **mobile robots** for special applications.
- Specialized test equipment installations for recycling of cars and household appliances.
- 2. Our expertise and skills we may bring to the project(s):

HORIZON-CL4-202X-TWIN-TRANSITION: MAAS/ Made in Europe Partnership

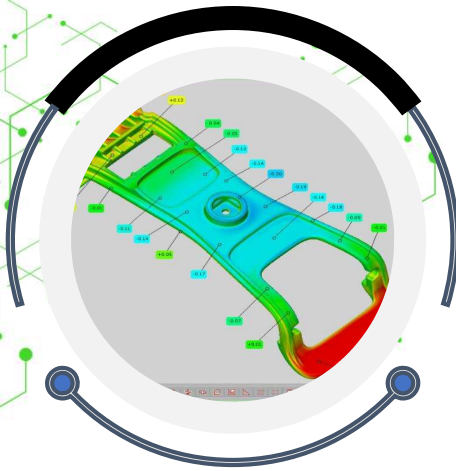
HORIZON-CL4-202X-DIGITAL-EMERGING

HORIZON-CL4-202X-HUMAN

Research interest for CL4-6 2026

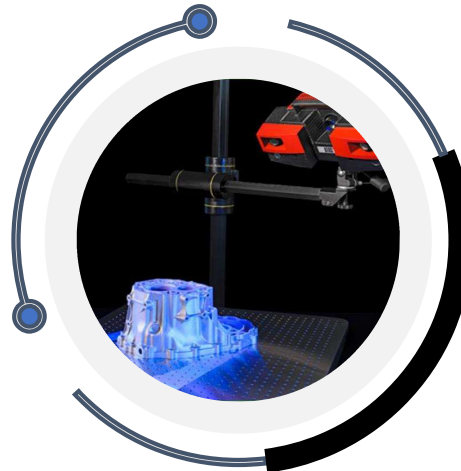
- **Remanufacturing** - **AI based Robotized repair and circular valorisation of laptops** and electronic devices. Implementation of AI-supported models for elements of laptops, image recognition and identification. **Machine learning algorithms** covering convolutional neural networks (**CNN**, e.g., **YOLO - You Only Look Once**) and Deep Neural Networks (**DNNs**), including attention mechanisms
- **Manufacture as a Service (MAAS)** - Sustainable and Agile Manufacturing with AI control. Manufacturing through the incorporation of AI-enabled concepts and tools
- **Circularity** (recycling and recovery of materials) - **Circular Economy** technology for efficient recovery of high-value materials by robotized disassembly of electronics waste.
 - Helping industry to respond to customers' demand for personalised products & services implementing **Smart specialization strategy**: National Smart Specialization "Automation and Robotics of technological processes".
- **intralogistics with our AMR/AGV** - cloud based real-time data acquisition from AMR and **AI based data analysis on inventory, operations**, and other relevant factors, providing valuable insights for decision-making to enhance Flexibility and Adaptability

Offer for other industries



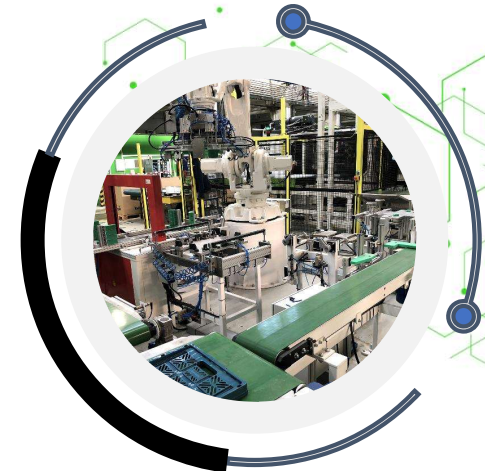
3D Scanning

ultra-fast reproduction of worn components



3D Printing

manufacturing spare parts made of heavy-duty bio-compatible materials



Fast delivery of spare parts

conveyors, feeders, process lines, instruments

DIGITAL TWIN

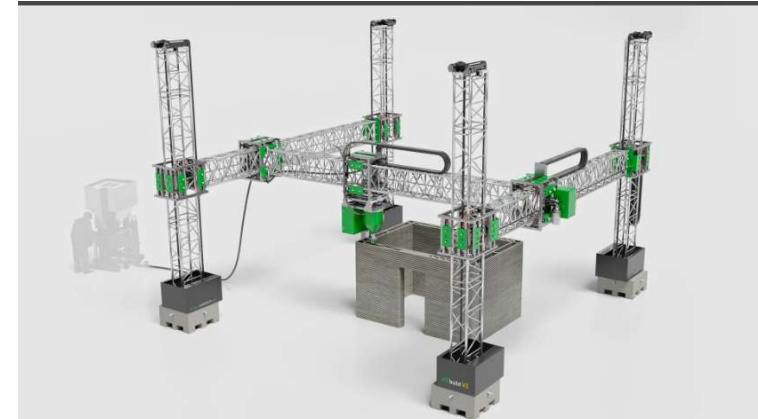
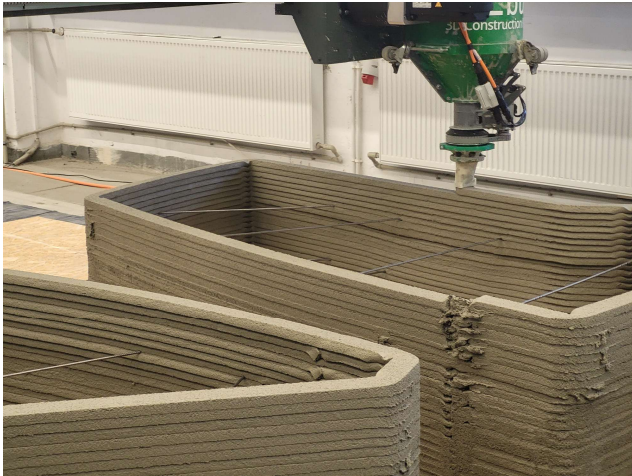
CPS for remote programming an industrial station for Wire Arc Additive Manufacturing (WAAM).



Technology of a digital twin in **virtual reality**.

Increases the **safety** of employees and enable remote cooperation with robots.

3D Construction Printing as a Service



1/22/2025

<venue>

Sample Projects



Technical Stairs, Embankment – E&K



Foundation Footings with Optimized Shape and as Lost Formwork

Model of a Technical Building



Concrete Planters - Non-Planar Printing; Color Printing



Figure 1: Trapezoidal nozzle



Figure 2: Rectangular nozzle



Figure 3: Elliptical nozzle



Figure 4: Smoothed nozzle



Figure 5: Print texture

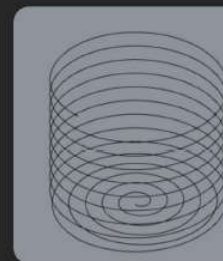


Figure 1: Printing path



Figure 2: Printing path with a visible change in extrusion parameters

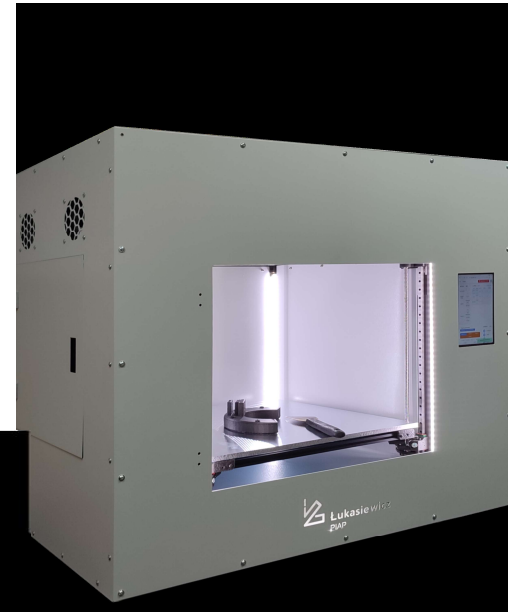
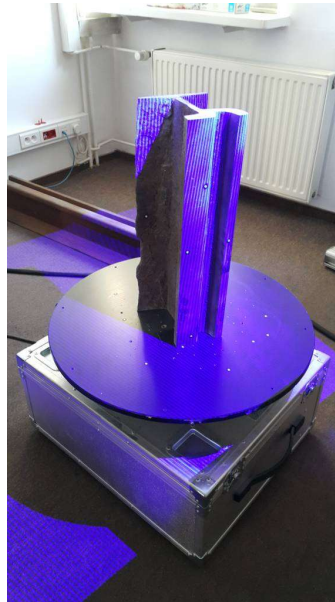
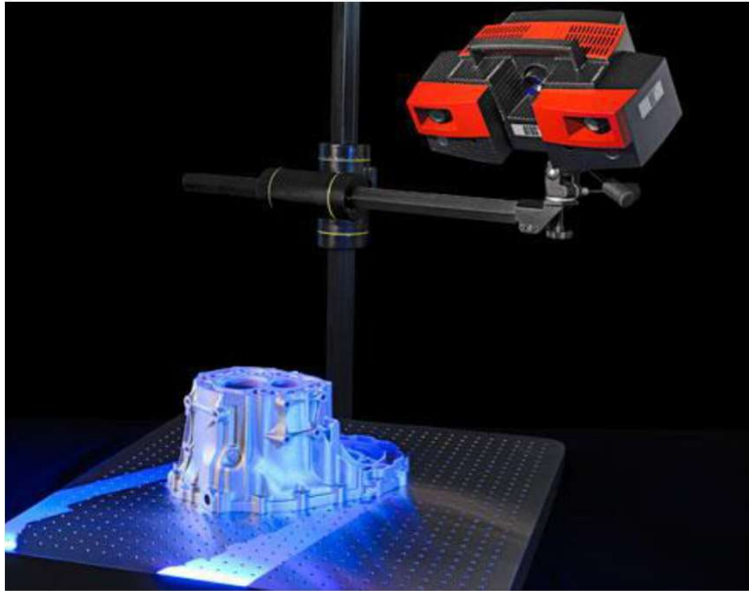


Figure 3: Final print

Foamed Polystyrene Extruder - FPE



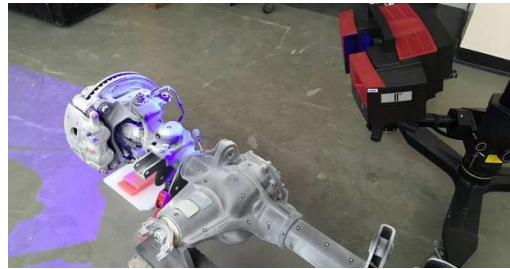
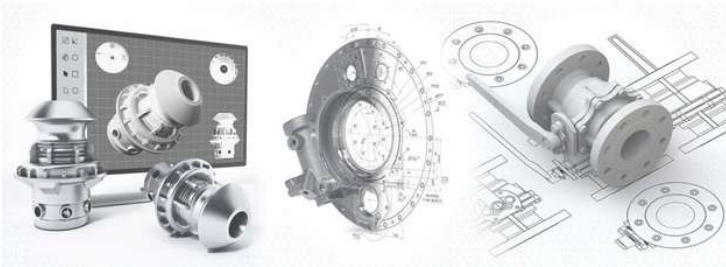
Production of parts using **industrial 3D printing** from any kind of materials - from polymers to metals and their alloys



Industrial Inspection System

Designing prototypes dedicated for target manufacturing technology.

Quality control in relation to CAD.



Production to railway

ELECTRONIC TACHOGRAPH
TC-XXXP for railway vehicles
— with CAN bus

MEASUREMENT AND LOGGING:

- ✓ TRACK VEHICLE SPEED
- ✓ ACTUAL TIME
- ✓ TRAVELLED DISTANCE

LOGGING BINARY SIGNALS
FROM VEHICLE DEVICES AND
MECHANISMS
(E.G. DEAD-MAN'S HANDLE, ATP, CLOSED
DOOR AND OTHER)

GENERATION OF SIGNALS CONCERNING
EXCEEDING SPECIFIED SPEEDS

Tachograf TC-XXXP
PIAP

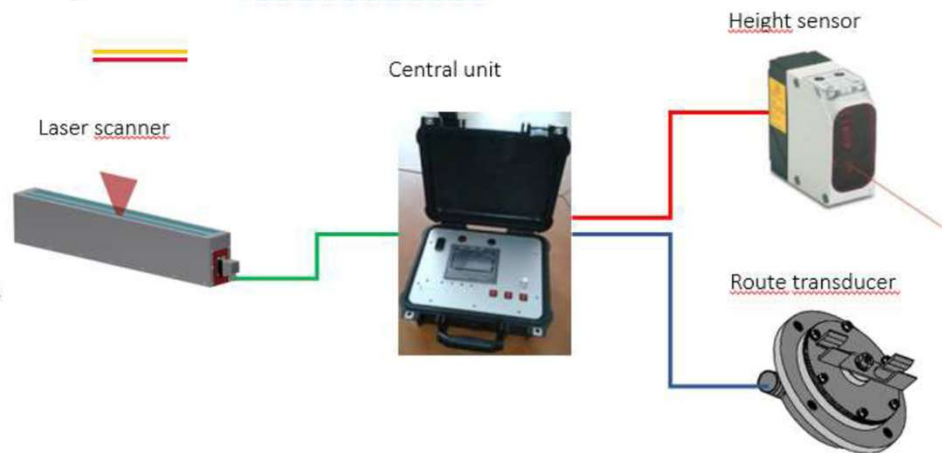
Inputs: Zasilanie, Wejście, Wyjście, Przetwornik drogi

Outputs: CAN1, CAN2, COM

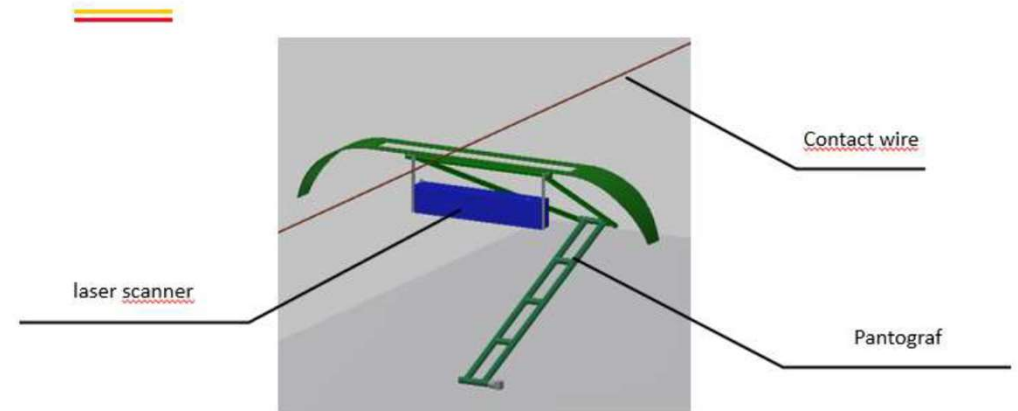
Display: 21 km/h, 14:16:14

Diagnostic & Inspection system of contact wire exhaustion

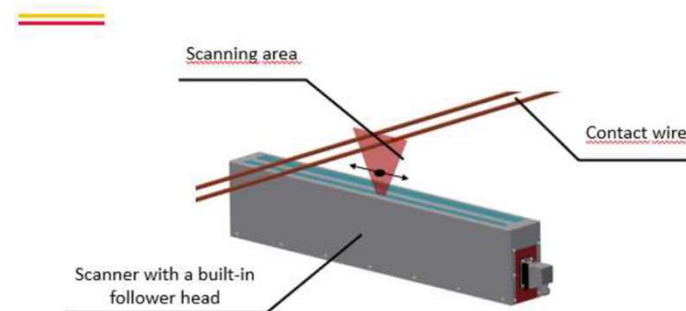
System structure



Laser scanner fitting



Laser skanner



Robotics applications for manufacturing SMEs

- palletising, depalletising,
- welding, bevelling (including plasma bevelling),
- assembly, handling,
- transport between stations,
- packaging,
- weighing out and batching,
- coating, grinding

