



Łukasiewicz
PIAP

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

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Łukasiewicz-PIAP

Łukasiewicz –PIAP: **RTO**, system integrator, mobile robots producer, 300 workers.

Technology Centre (Robotics, Automation, CPS, embeddedAI)
Digital Innovation HUB. EDIH. **Inside, ADRA** member.
Industry 4.0 National Contact Point





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

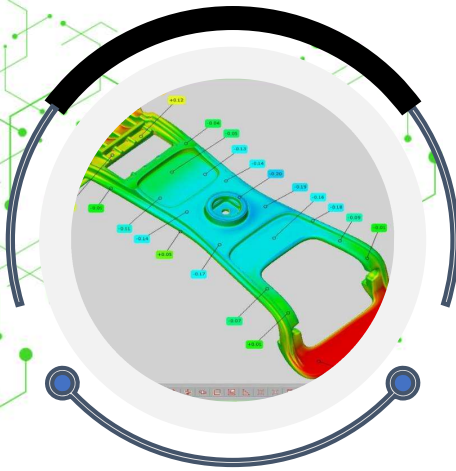
HORIZON-CL4-202X-DIGITAL-EMERGING

HORIZON-CL4-202X-HUMAN

Research interest for CL4 2025

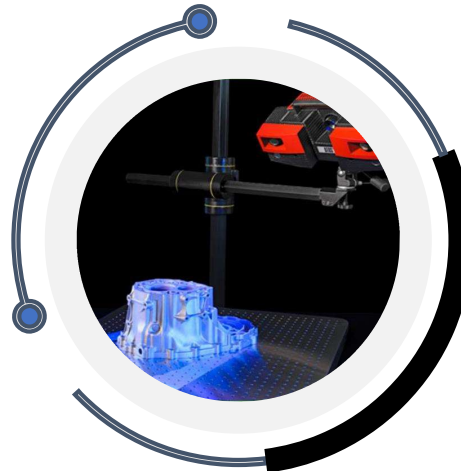
- **Remanufacturing** of both components and products towards full circularity:
 - Production lines upgrade with **advanced machinery, robots**, etc.
 - **Additive manufacturing** for remanufacturing
- **Manufacture as a Service (MAAS)** - Sustainable and Agile Manufacturing with AI control. Manufacturing 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".
- ***We are looking for partners and Coordinators to the 2025 Calls.***

Offer for other industries



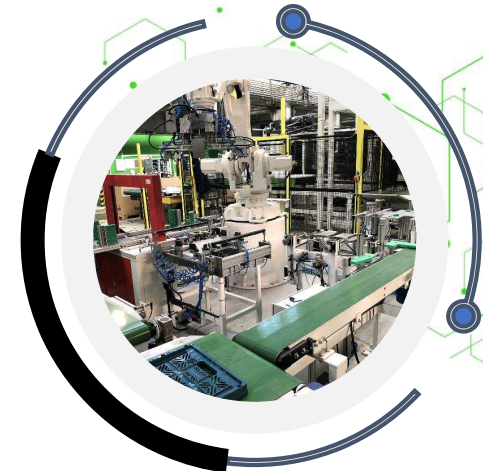
3D Scanning

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.

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

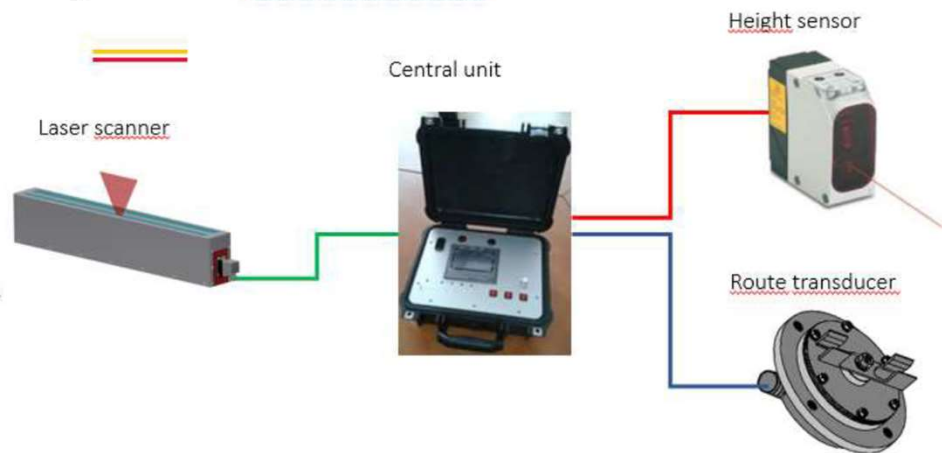
Inputs: Zasilanie, Wejście, Wyjście, Przetwornik drogi

Outputs: CAN1, CAN2, COM

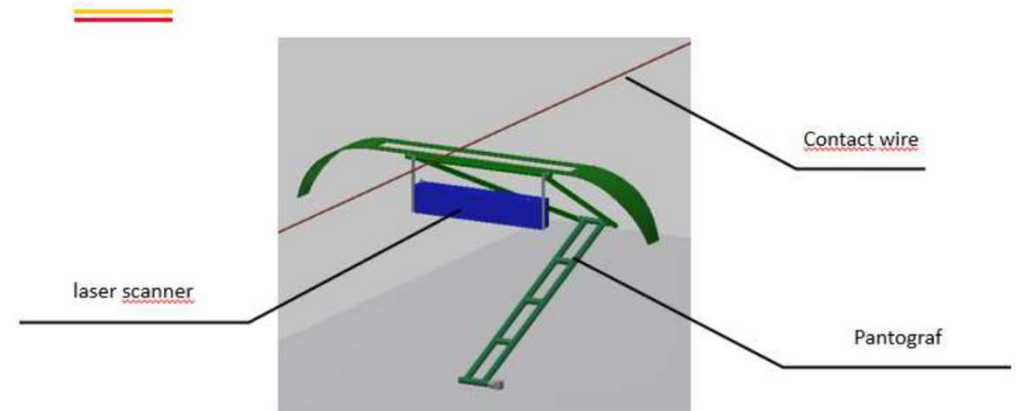
Display: 21 km/h, 14:16:14

Diagnostic & Inspection system of contact wire exhaustion

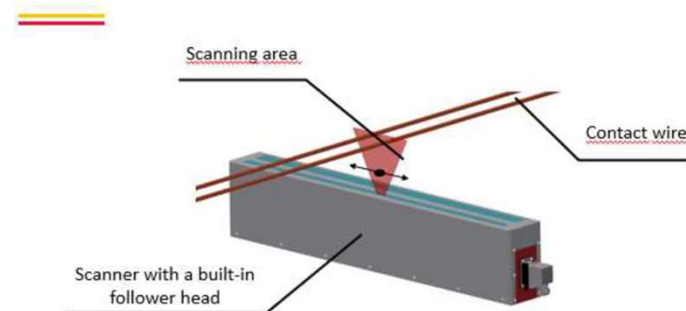
System structure



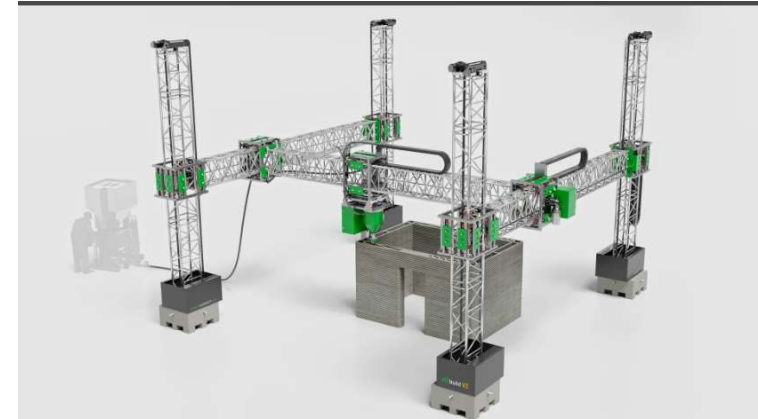
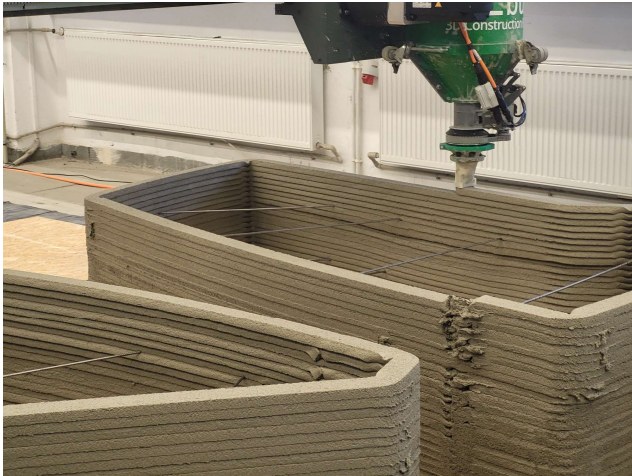
Laser scanner fitting



Laser skanner



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

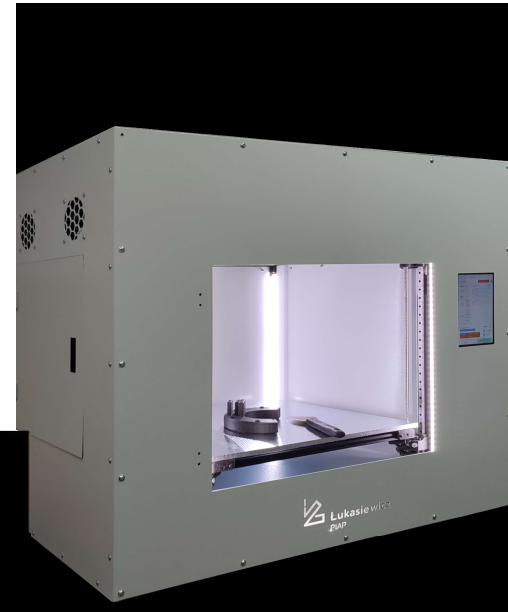
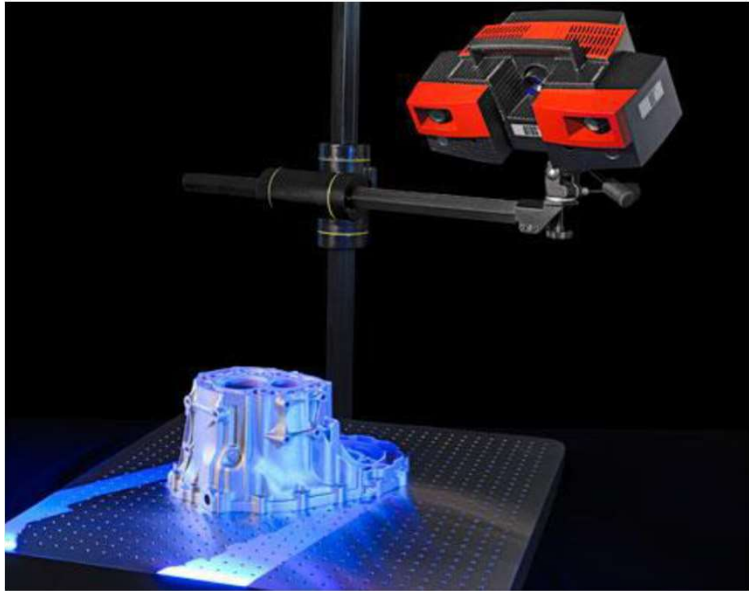
Figure 2: Printing path with a visible change in extrusion parameters

Figure 3: Final print

Foamed Polystyrene Extruder - FPE



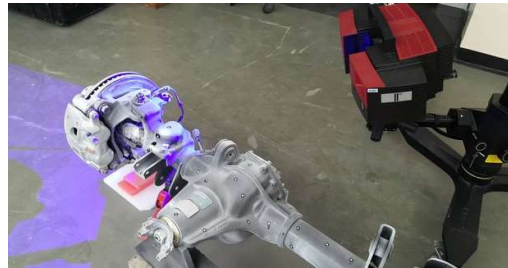
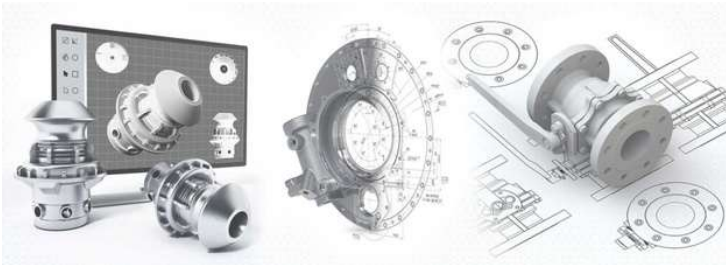
Production of parts using **industrial 3D printing** from any kind of materials - from polymers to metals and their alloys



Industrial Inspection System

Designing prototypes dedicated for target manufacturing technology.

Quality control in relation to CAD.



Robotics applications for manufacturing SMEs

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

