Cofinanțat de
Uniunea Europeană

Research Outcomes, Technology Transfer and Societal Impact in the Romanian Hub for Artificial Intelligence

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HUB ROMÂN DE INTELIGENȚĂ ARTIFICIALĂ

ROMANIAN INTERNATIONAL CONFERENCE FOR EDUCATION AND RESEARCH
4-5 November 2026

What is HRIA?

A national ecosystem connecting excellence in AI research with the needs of industry and society

- TOP-TIER SCIENTIFIC RESEARCH
- TRANSFER OF RESEARCH RESULTS TO INDUSTRY AND SOCIETY
- DEVELOPMENT OF NEW PRODUCTS AND SERVICES
- GENERATION OF A NUCLEUS OF KNOWLEDGE AND DEVELOPMENT IN ARTIFICIAL INTELLIGENCE INTEGRATED INTO THE EUROPEAN RESEARCH ARI

PROGRAM FOR SMART GROWTH, DIGITALIZATION AND FINANCIAL INSTRUMENTS 2021–2027 (PoCIDIF)
Priority 1. Supporting and promoting an attractive and competitive RDI system in Romania

Call PCIDIF/484/PCIDIF_P1/OP1/RSO1.1/PCIDIF_A2 – Support for 2 projects in the field of advanced technologies and the creation of innovation and technology transfer hubs in priority areas, Cod SMIS 2021- 351416

Duration: 2025–2029

Cod SMIS 2021- 351416

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Why HRIA? From distributed competencies to an AI ecosystem

LEAD Universitatea Națională de Știință și Tehnologie POLITEHNICA București

P1 Universitatea Tehnică din Cluj-Napoca

P2 Universitatea de Vest din Timișoara

P3 Universitatea Tehnică „Gheorghe Asachi" din Iași

P4 Universitatea Politehnica din Timișoara

P5 Universitatea din București

P6 Universitatea „Babeș-Bolyai" din Cluj-Napoca

P7 Beia Consult International SRL

P8 Centrul IT pentru Știință și Tehnologie SRL

P9 GreenSoft SRL

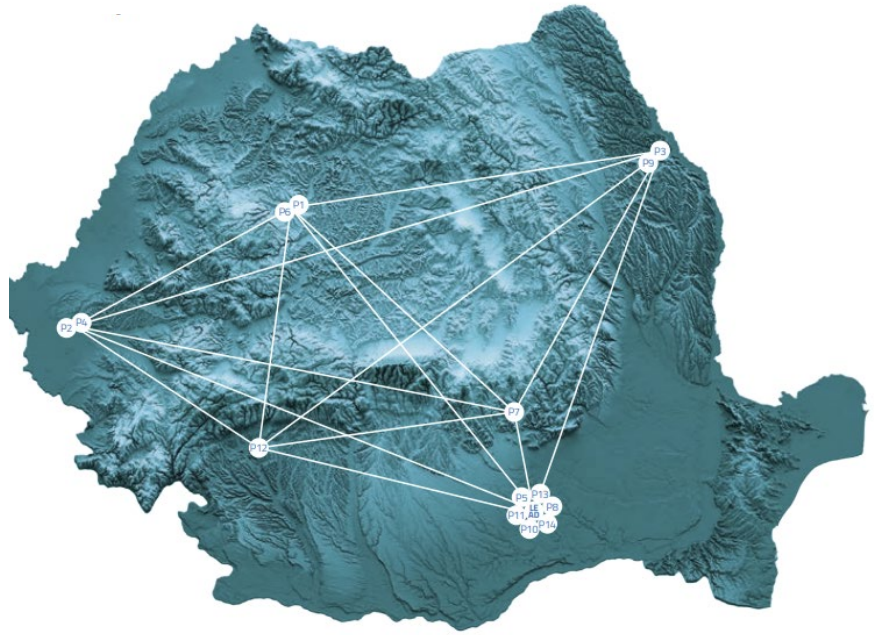
P10 Neural Grader SRL

P11 Safetech Innovations SA

P12 SoftTehnica SRL

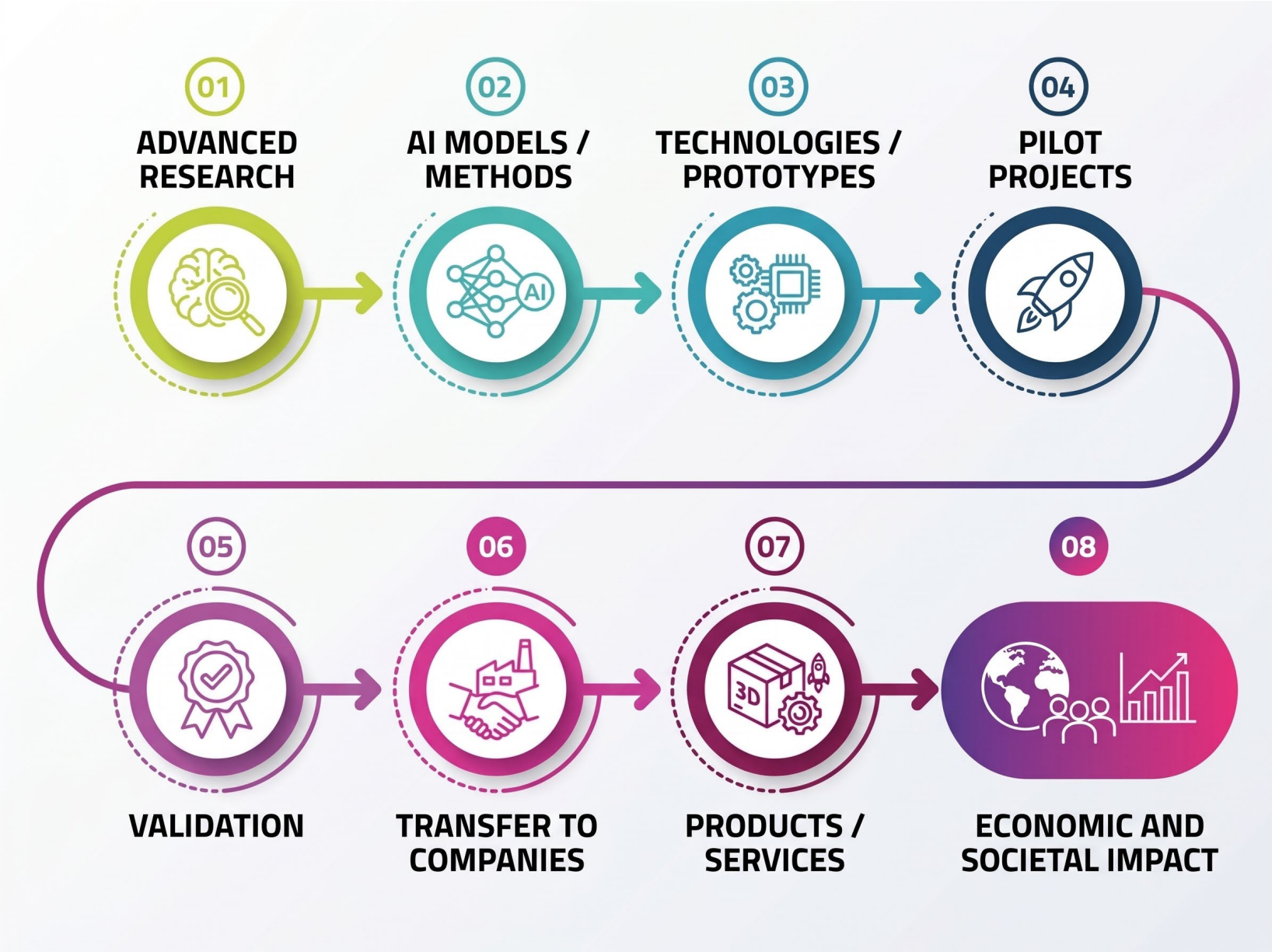
P13 Technology Systems and Services International SRL

P14 Terrasigna SRL

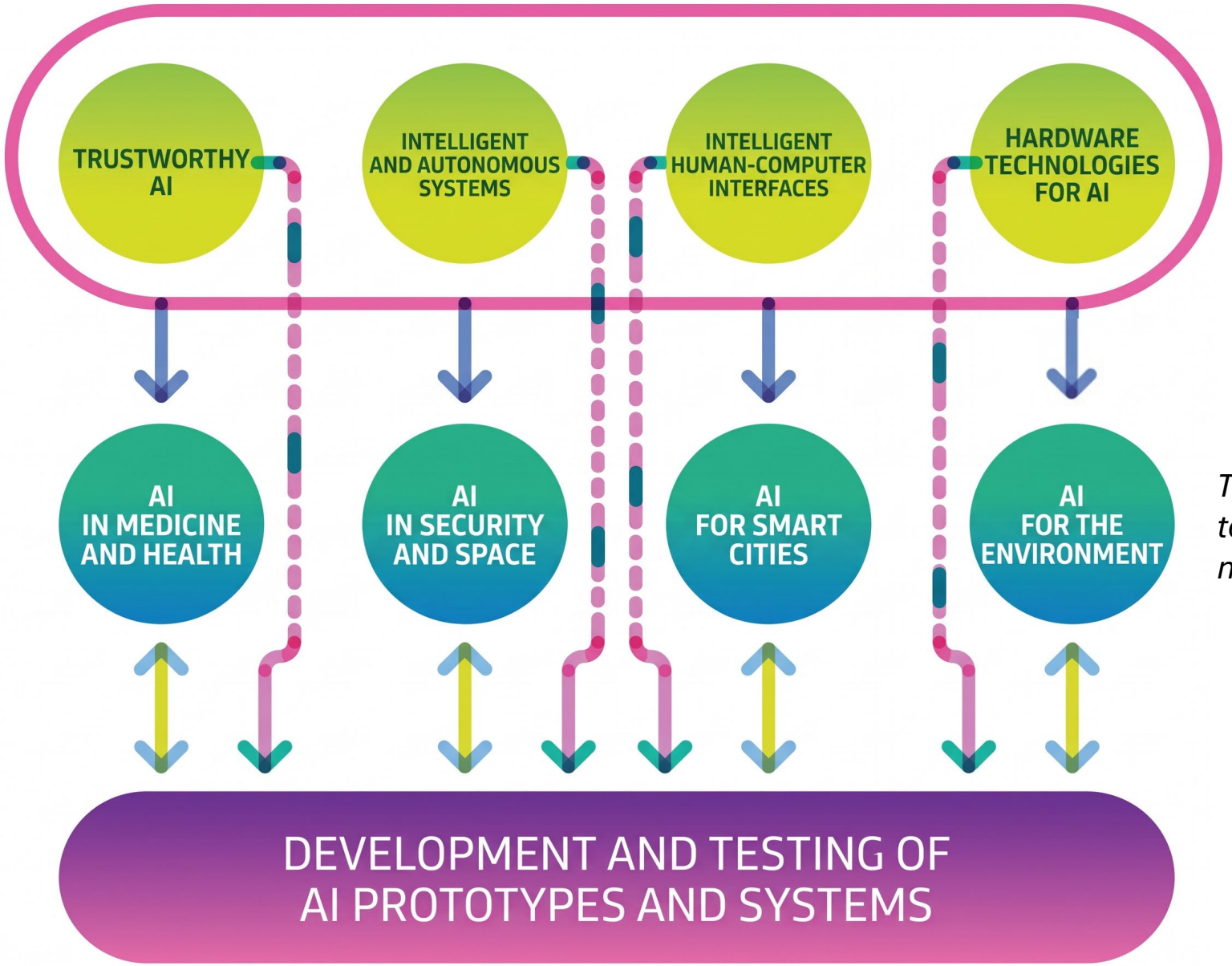


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How does it work?



HRIA technology portfolio

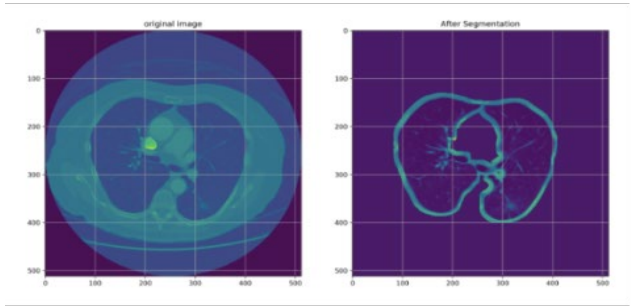


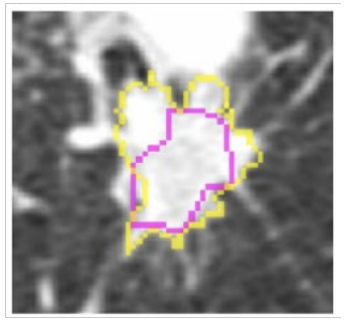
The same fundamental AI technologies are used across multiple domains

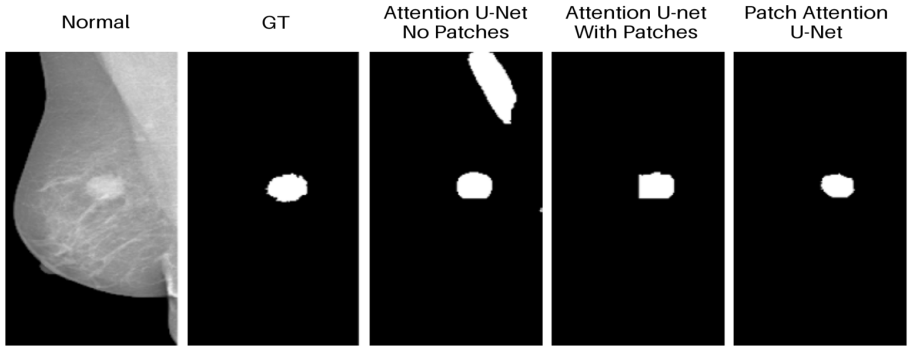
AI for health: from data to decisions and intervention

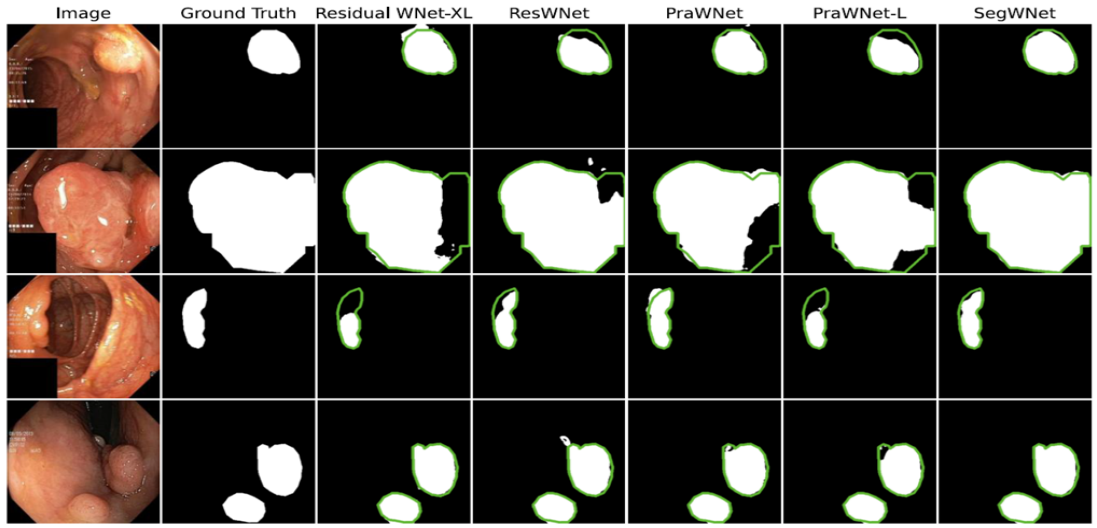
AI-assisted diagnosis

- **Collaborative and explainable analysis** of medical images
- Segmentation and classification for **breast, colorectal and lung cancer**
- A structured architecture that preserves semantic consistency while jointly exploiting local detail, global context, and uncertainty-aware refinement





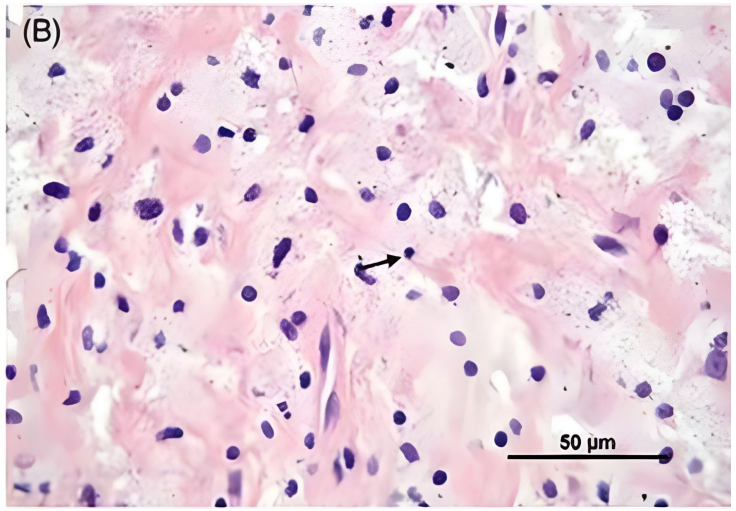




AI for health: from data to decisions and intervention

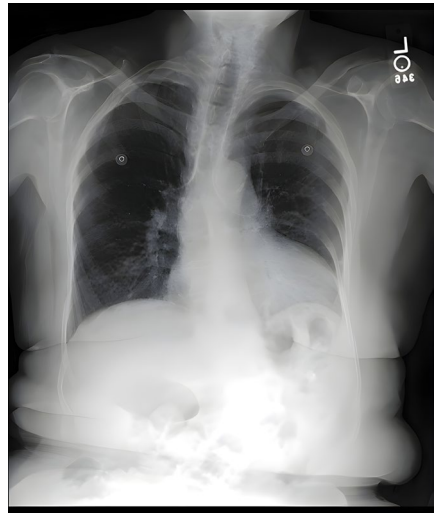
Interpreting different types of medical data

- **Robust interpretation of multimodal medical data** using VLMs
- **Using RL for knowledge transfer**
- Evidence that **aggressive filtering hurts Medical VQA**
- **Quality-Aware Training (QAL/QAP)** that learns also from noisy samples instead of simply discarding them



Light microscopy image of typical cells found in the periprosthetic tissue of both groups. Macrophages with some plasma cells (black arrow). H&E ; Scale bar, 50 µm.
Tags:

- Language: English
- Has references: False
- Ambiguous answer: False
- Answer not in image: False
- Missing cues: False
- Multiple panels: False
- Schematic image: False
- Measurement quantity: True
- Relative quantity: False
- Image count references: False
- Unclear spatial references: False



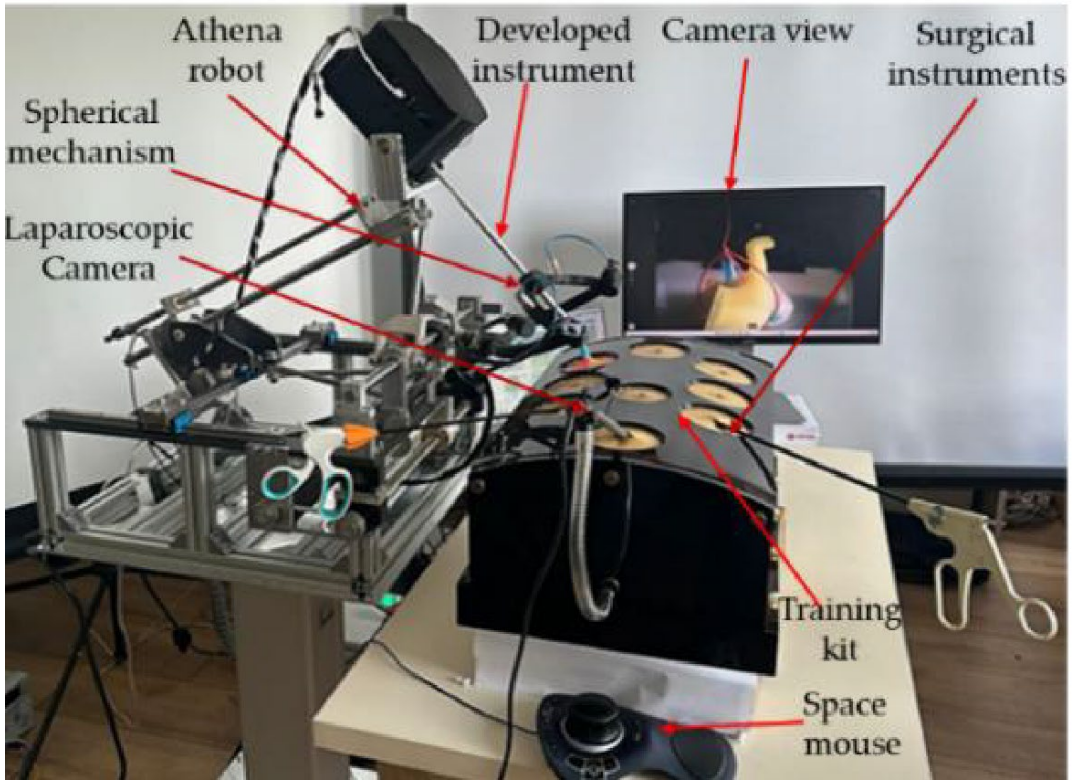
Question: Are there indications of any technical assessments within the cardiac silhouette?
Answer: Yes
Tags:

- Language: English
- Has references: False
- Ambiguous answer: False
- Answer not in image: False
- Missing cues: False
- Multiple panels: False
- Schematic image: False
- Measurement quantity: False
- Relative quantity: False
- Image count references: False
- Unclear spatial references: False

AI for health: from data to decisions and intervention

Medical robotics

Experimental platform for pancreatic robotic surgery by integrating the ATHENA parallel robot with a flexible laparoscopic instrument, teleoperated control, and a Digital Twin framework based on virtual reality



AI for health: from data to decisions and intervention



Neurological rehabilitation

- **Brain-computer interface** that translates brain signals into real-time feedback for motor recovery of patients after stroke
- **Intelligent virtual therapist** for neuromotor rehabilitation – 20 new neuromotor and cognitive **exergames** – Patient-oriented system: dynamic adaptation, assistance, monitoring, recommendation, intelligent virtual companion



One exergame

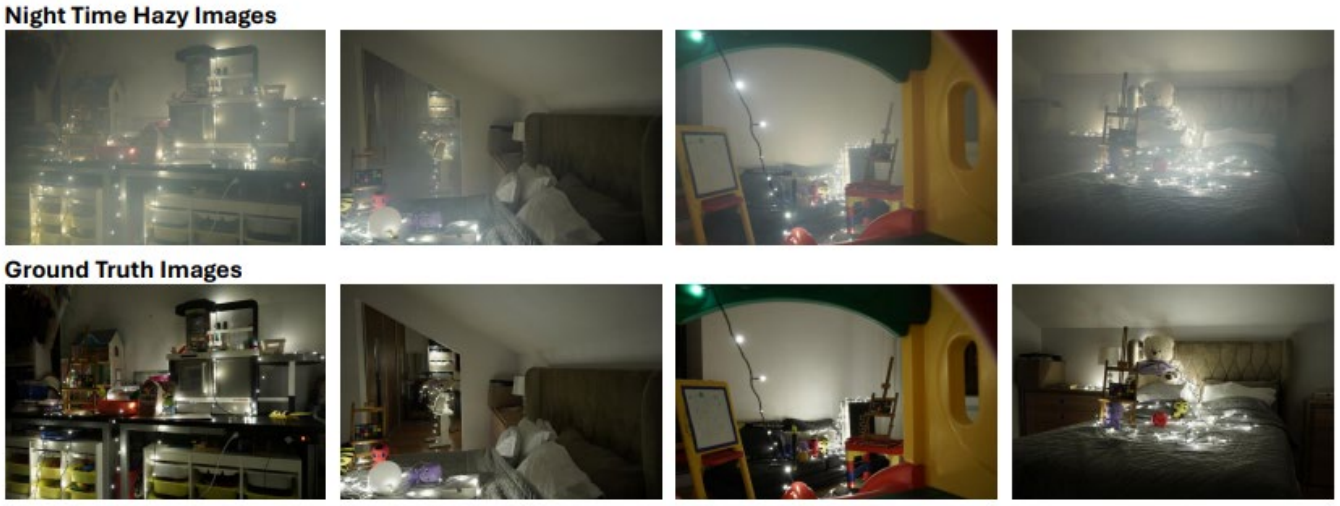


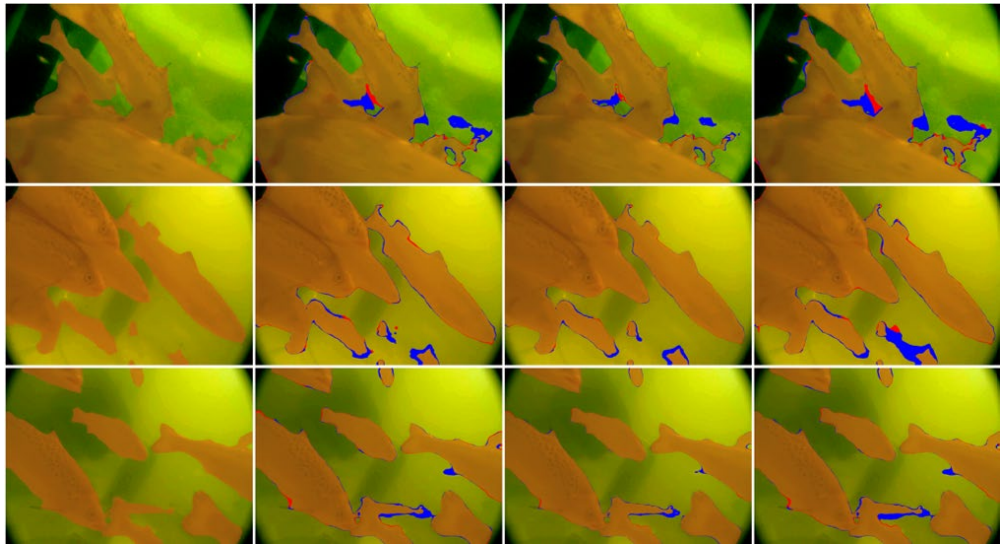
AI for autonomous systems

Autonomous perception in difficult real-world conditions

- Image dehazing under rain, night fog and dust

- Fish segmentation in challenging underwater video sequences with low visibility



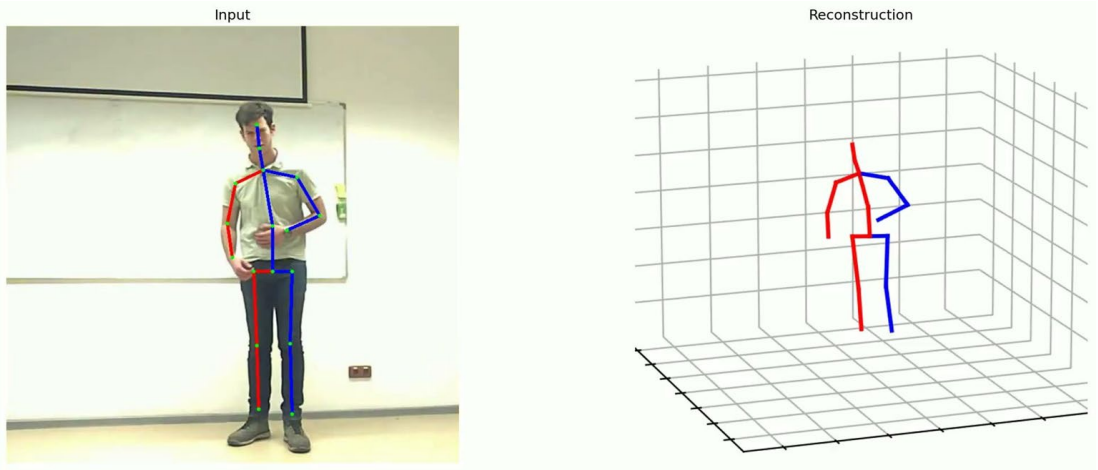


AI for autonomous systems

Activity tracking

- **Skeleton-based gait analysis and recognition** through self-supervised learning
- **XAI for for skeleton-based activity recognition** – used also for improved data representation
- Use of **semantic information into 3D point prediction**

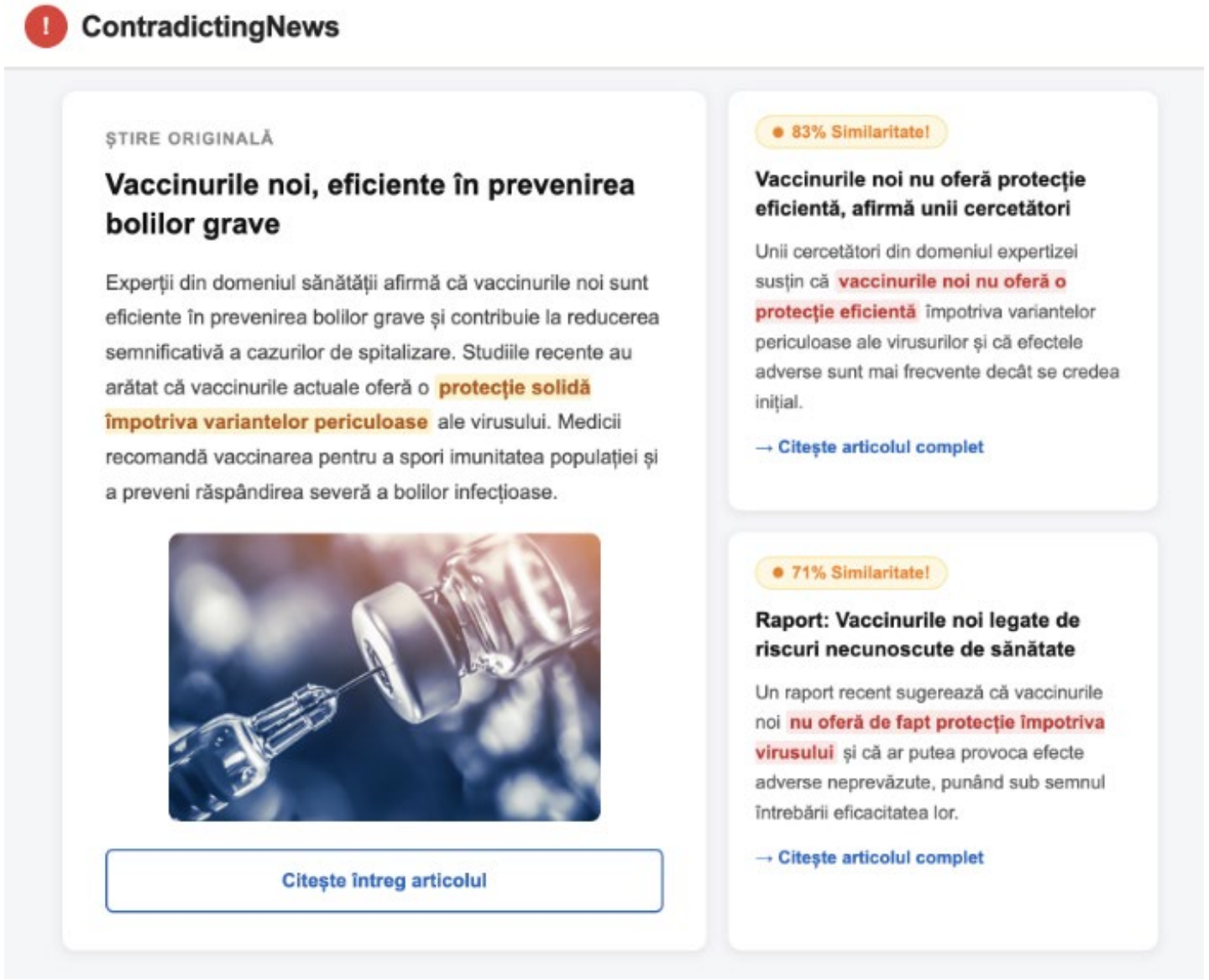




AI for combating disinformation

- **Contradictory news**

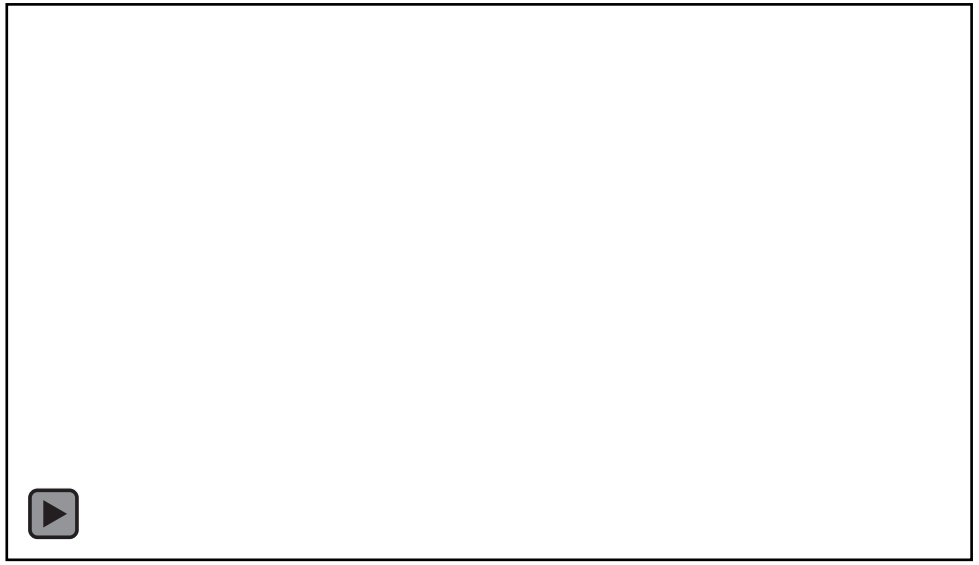
Identifying news items on the same topic but with contradictory content

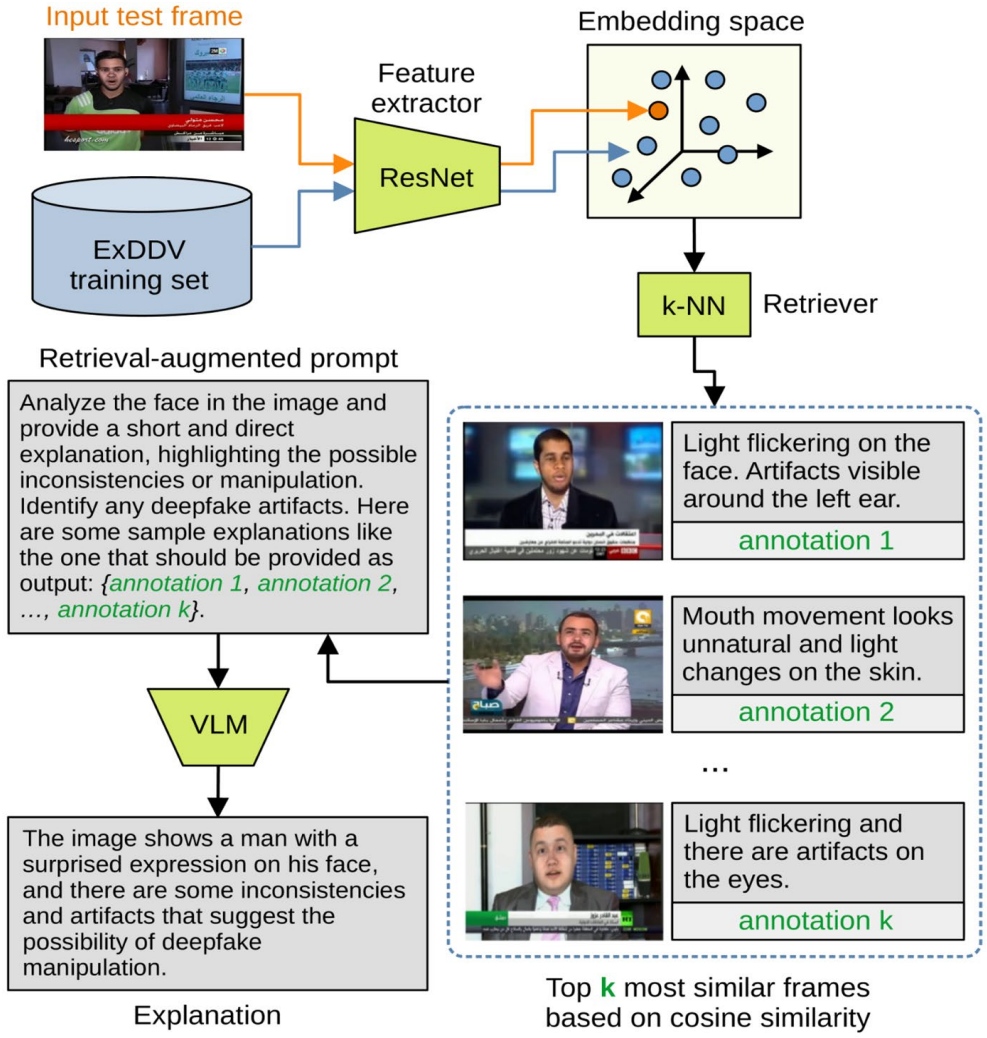


AI for combating disinformation

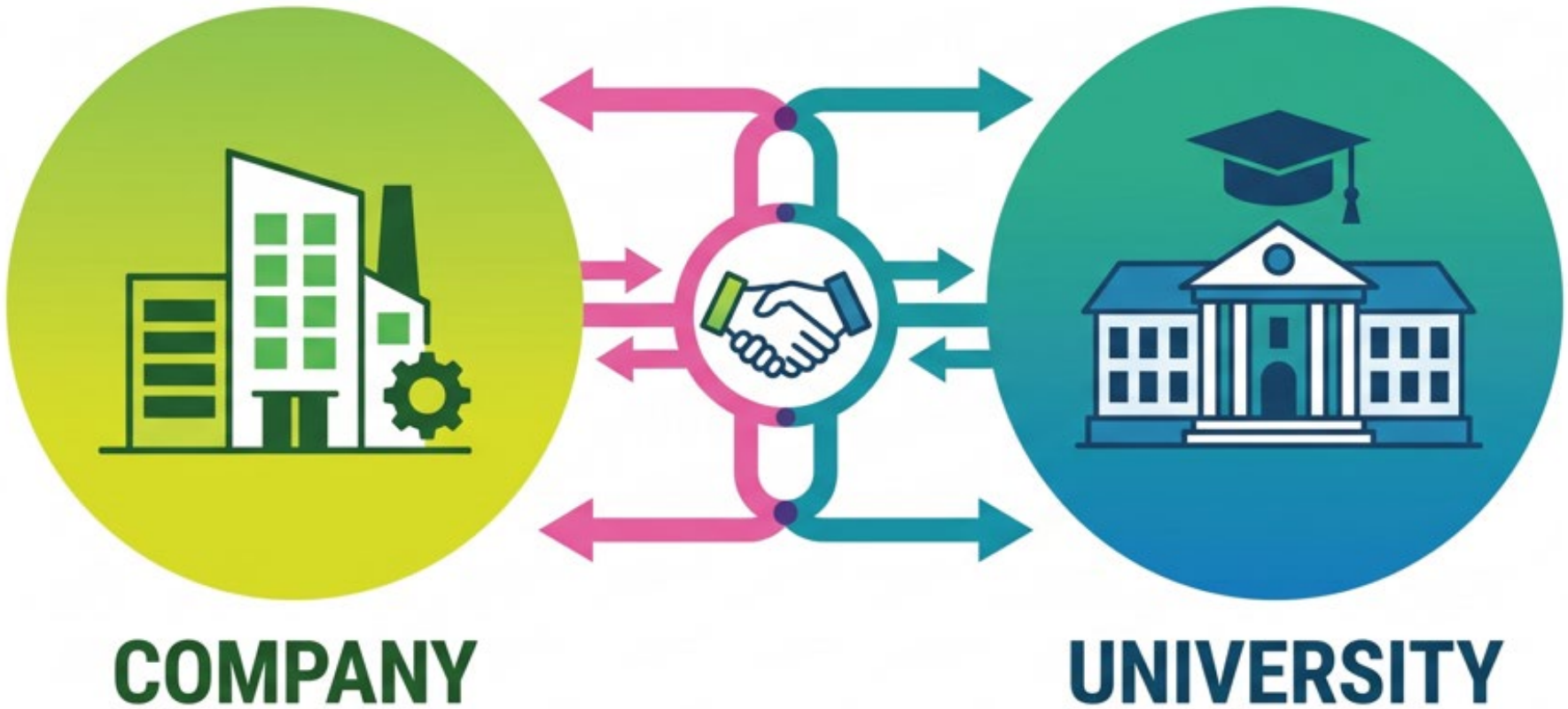
Identifying forged video recordings

- **Explainability in identifying forged video recordings**
- **Learning real-world spatio-temporal relationships for identification of forged videos**





COMPANY-UNIVERSITY COOPERATION

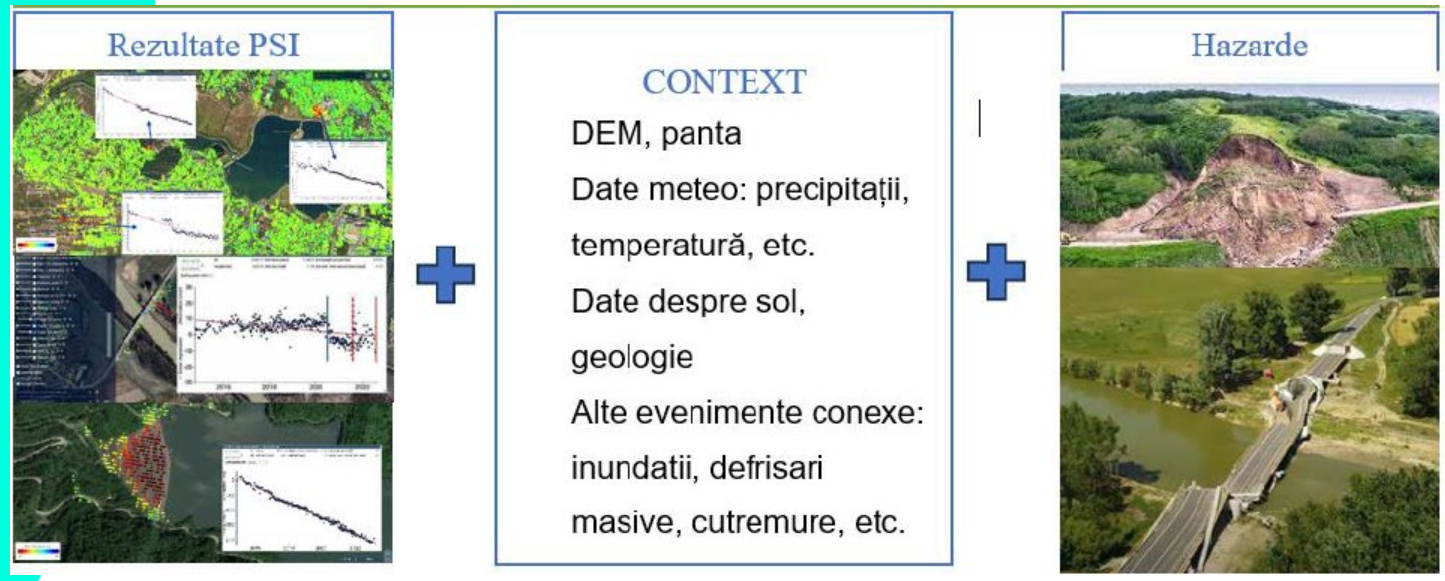


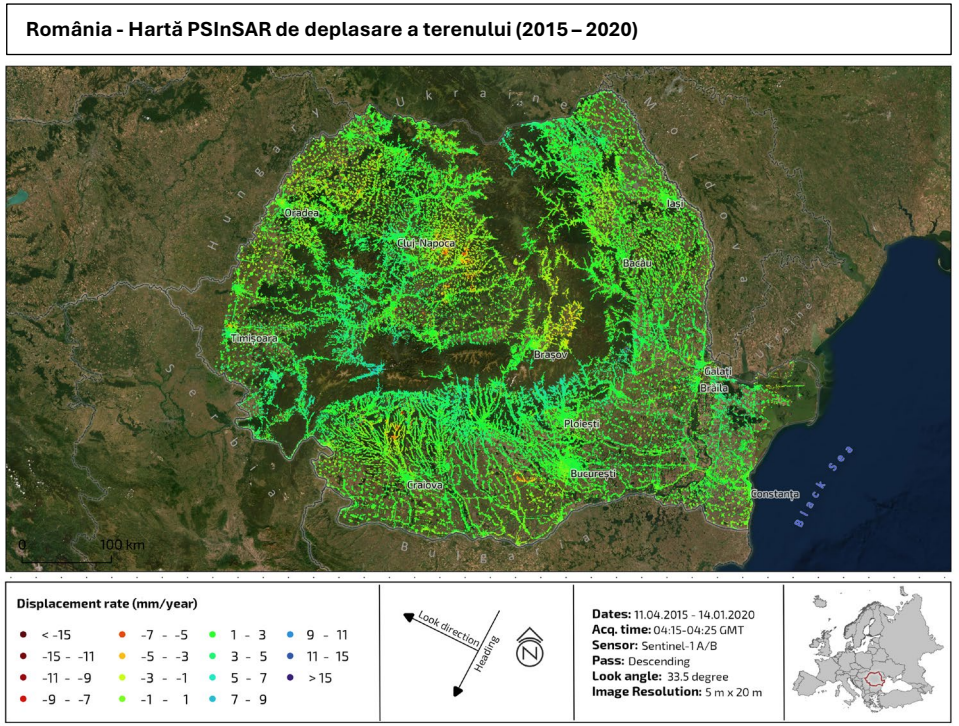
AI for infrastructures

Intelligent software system for satellite monitoring of ground and infrastructure stability

Early detection of **areas / infrastructures at risk of instability:**

- landslides
- road and railway infrastructure
- urban areas
- dams



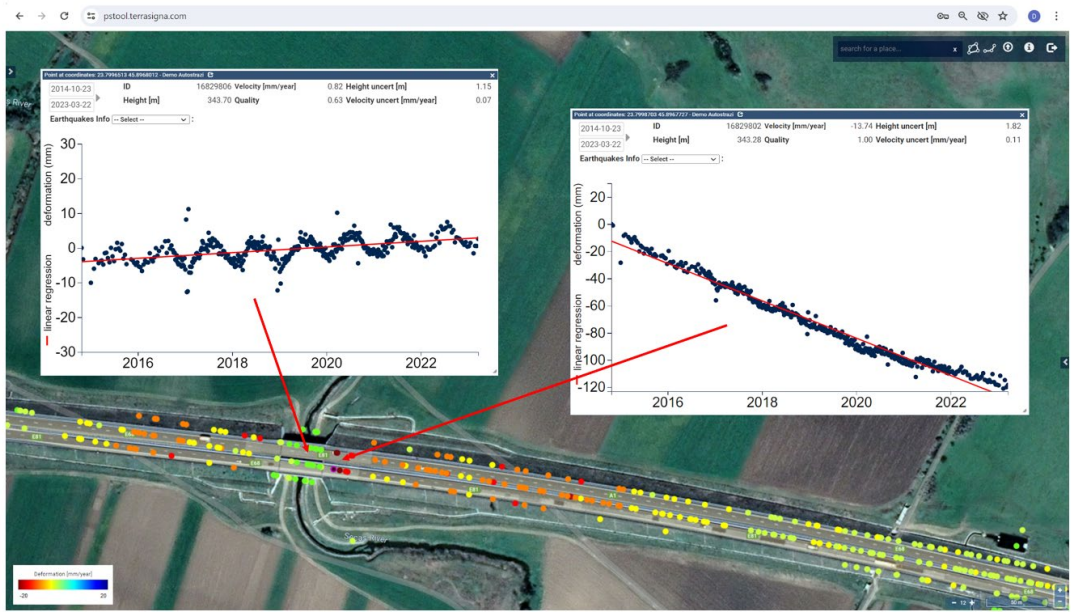


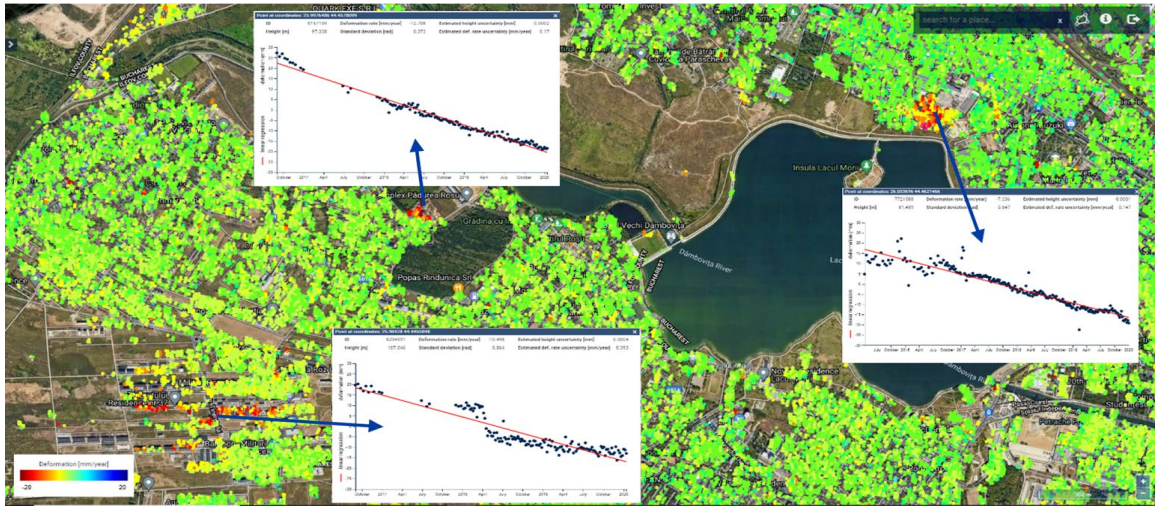
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TERRASIGNA™

Analyzing **PSInSAR** (Persistent Scatterer Interferometric Synthetic Aperture Radar) – **Challenges:**

- Irregular distribution in space and time
- Building training datasets
- Inherent noise
- Handling massive data volumes: wide-coverage maps (e.g. EGMS), which contain tens of millions of points





AI for industry: from prototype to production line

Lumber3D for wood industry

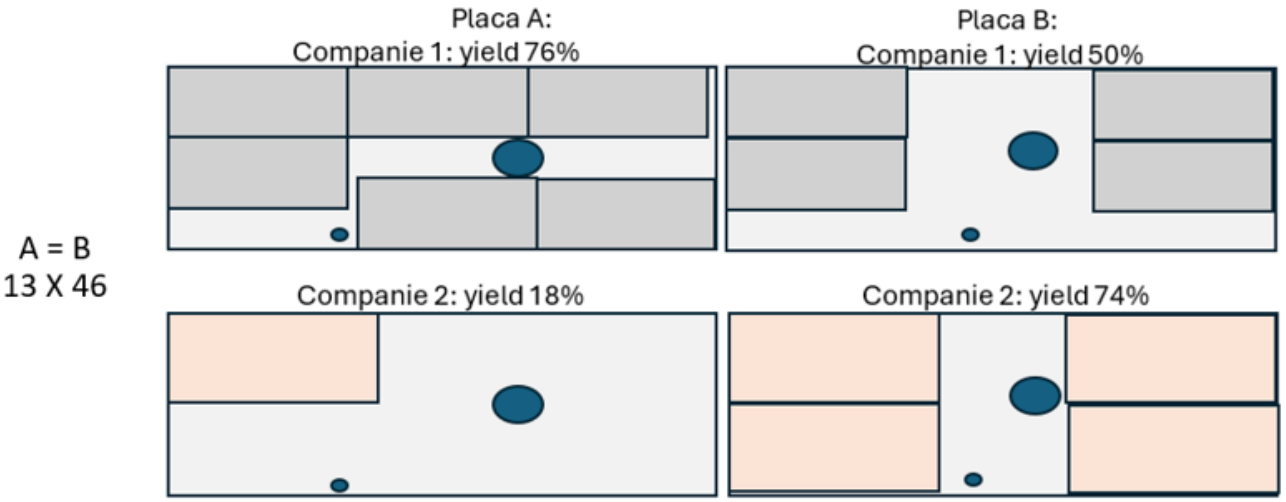
Quality control and processing optimization

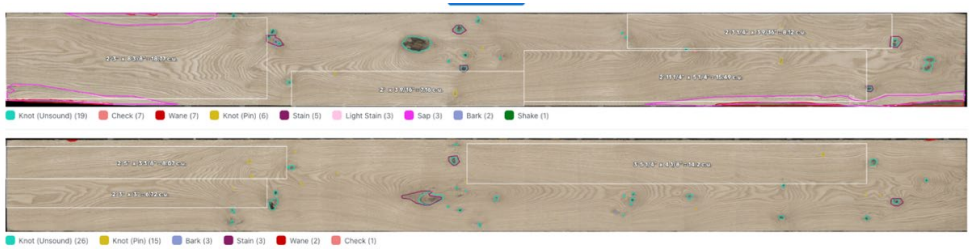






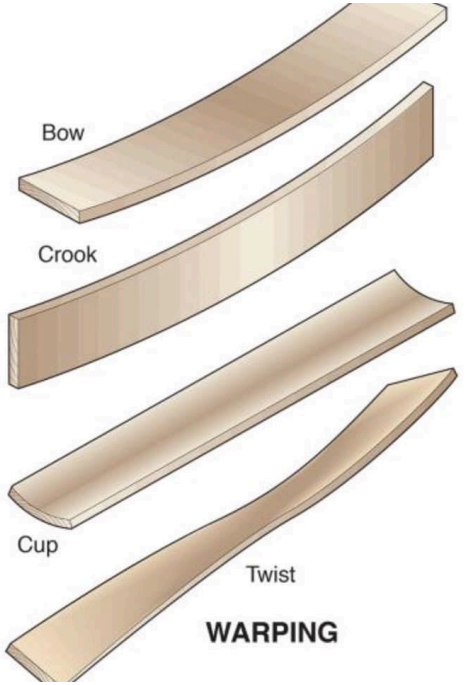
Lumber3D





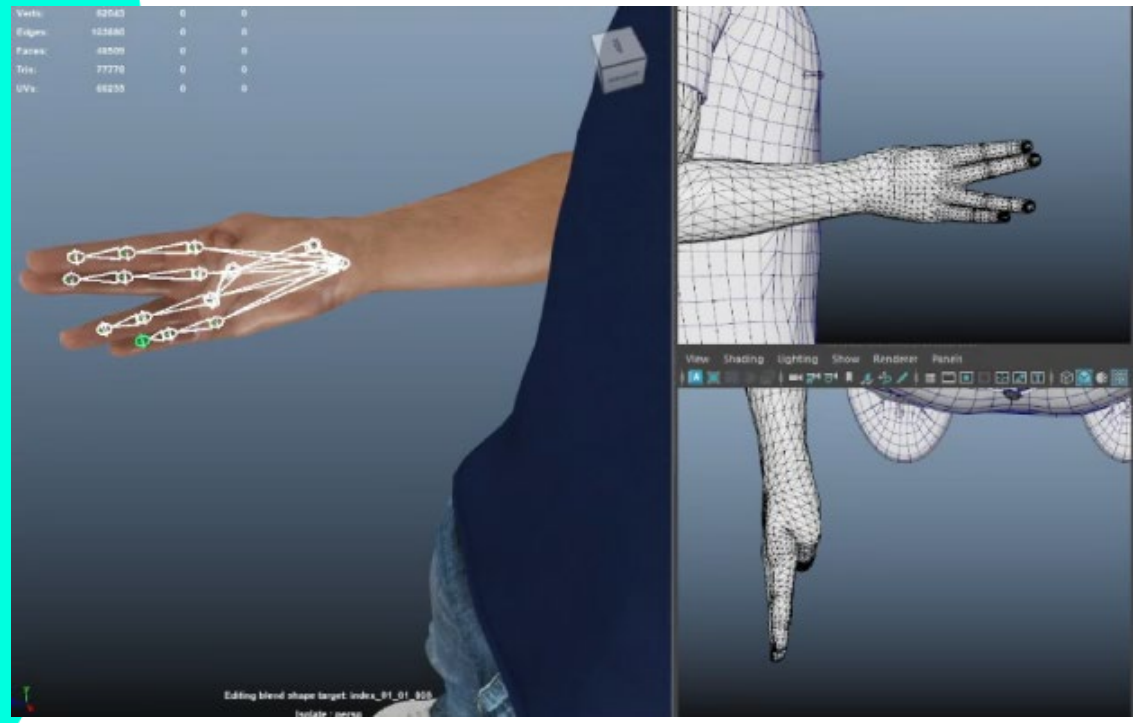
Challenge: boards of variable sizes and shapes, in rapid motion, with vibrations, dust, sawdust and subtle textures, which are very hard to track robustly

- Thickness measurement
- Shape modeling
- Transverse deformation (cup)
- Longitudinal deformation (bow)
- Torsion (twist)
- Wavy (crook)
- Precise cutting to reduce losses



AI for inclusion and accessibility

SignAll – Facilitating communication in sign language

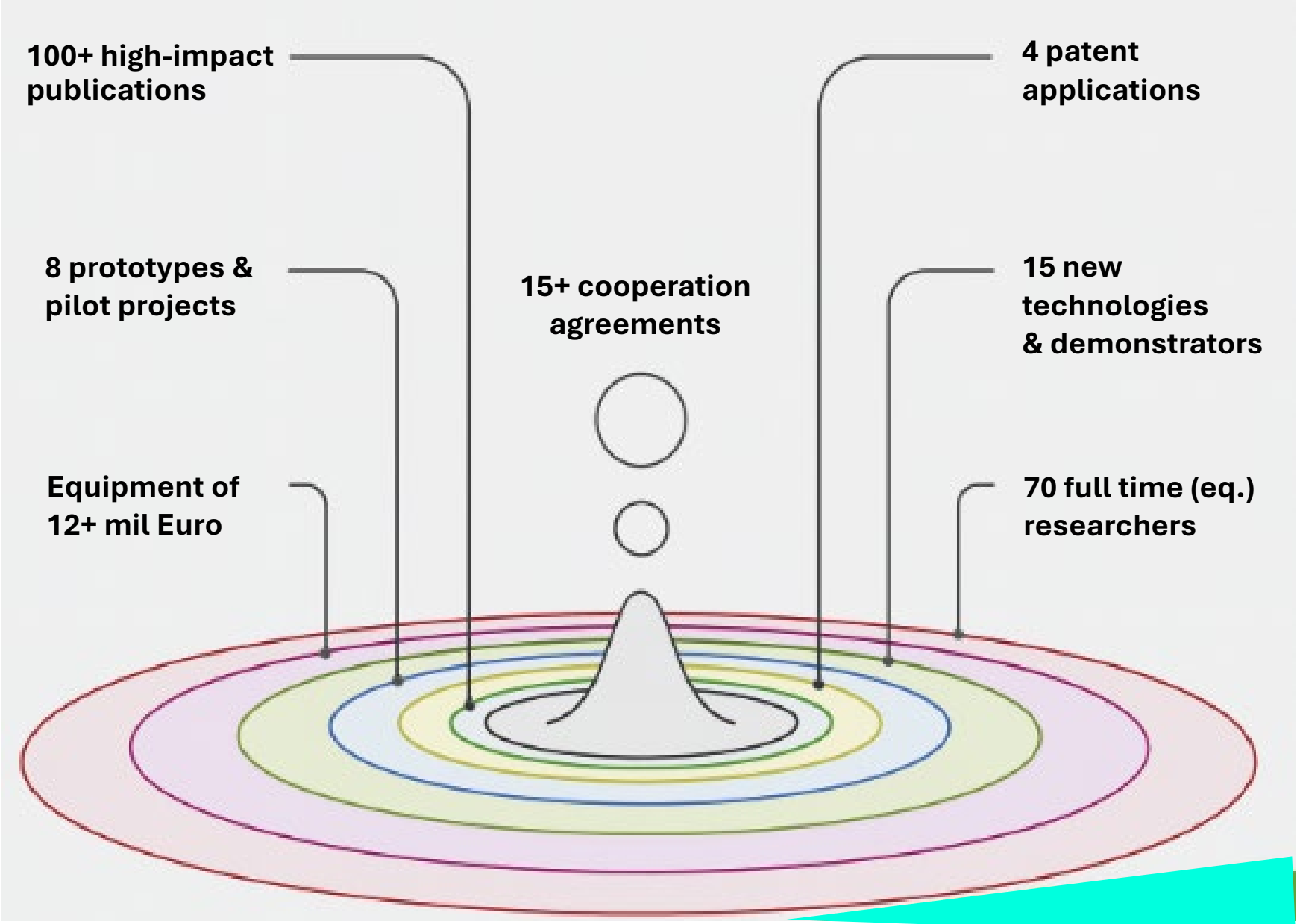






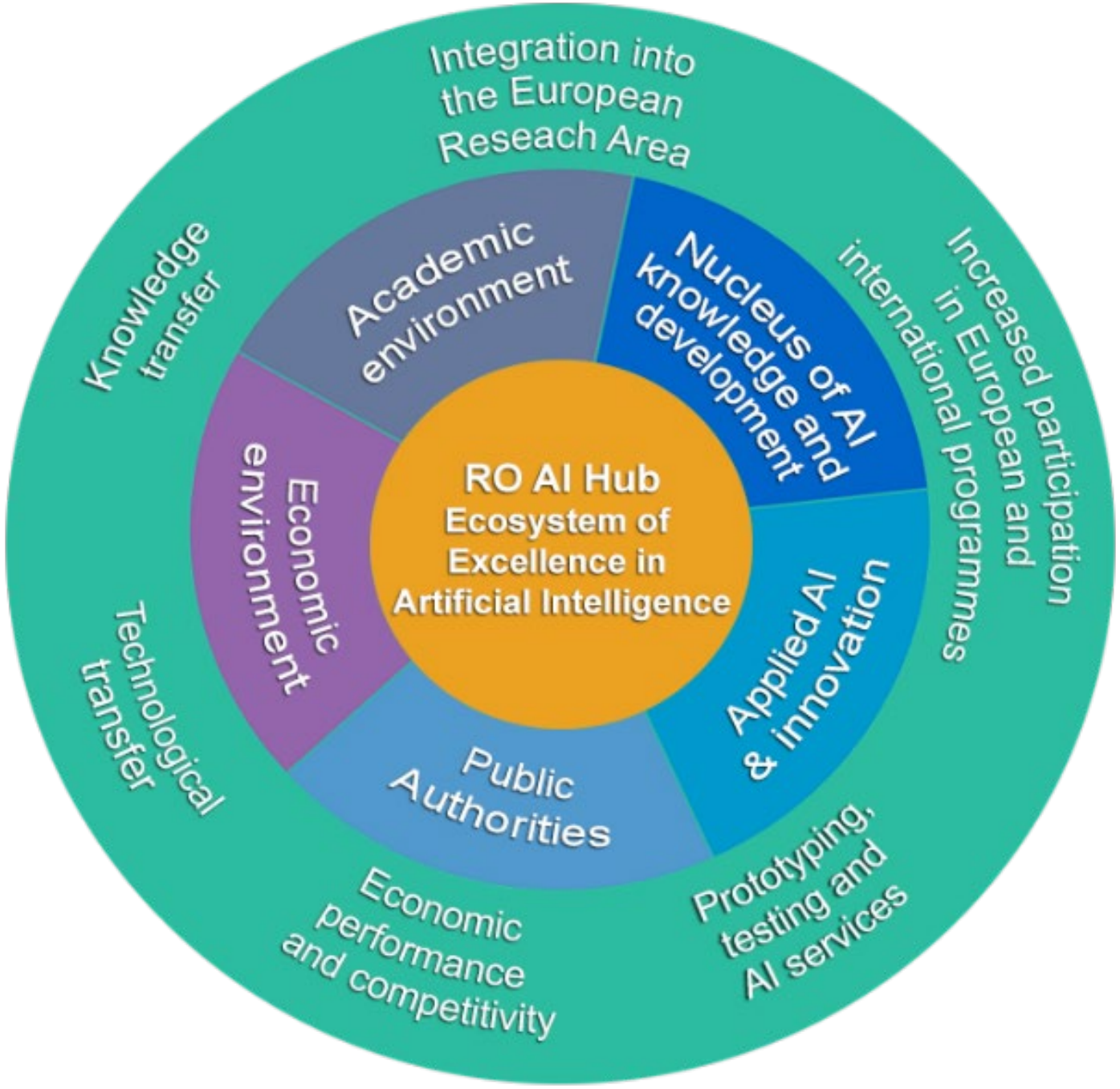
HRIA in numbers: research that delivers results

March 2025 – July 2026



Impact

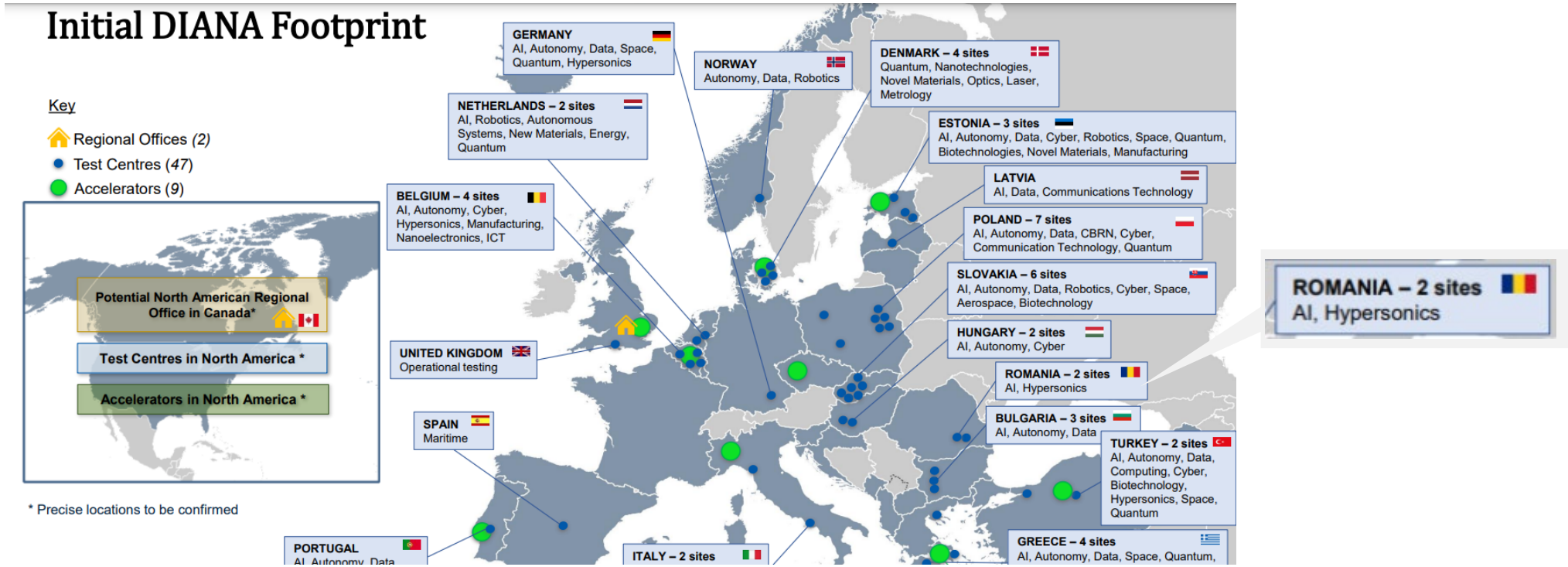
- Create a unique AI excellence ecosystem in Romania, combining large-scale RDI activities with tangible economic impact
- Unite the national AI community, strengthen Romania's presence in Europe and globally, and provide resources for innovation and cross-sectoral development



Leader HRIA

At POLITEHNICA, the project is implemented through the **Center of Excellence in Artificial Intelligence** of the university

The Center is an AI Testing Center within the **DIANA network** (Defence Innovation Accelerator for the North Atlantic).





Thank you!

Project manager

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