



CIIRC CTU 10 Years Anniversary

Vladimír Mařík

30.5.2023

Important First Steps

17 June
2008



- The youngest institute of the CTU
- Focus on interdisciplinary research in Industry 4.0, AI, energy distribution and health-care
- Established in July 2013, fully operational since May 2017 (opening of new building)



Dr. Ondřej Velek
Director



Center of Research Excellence:

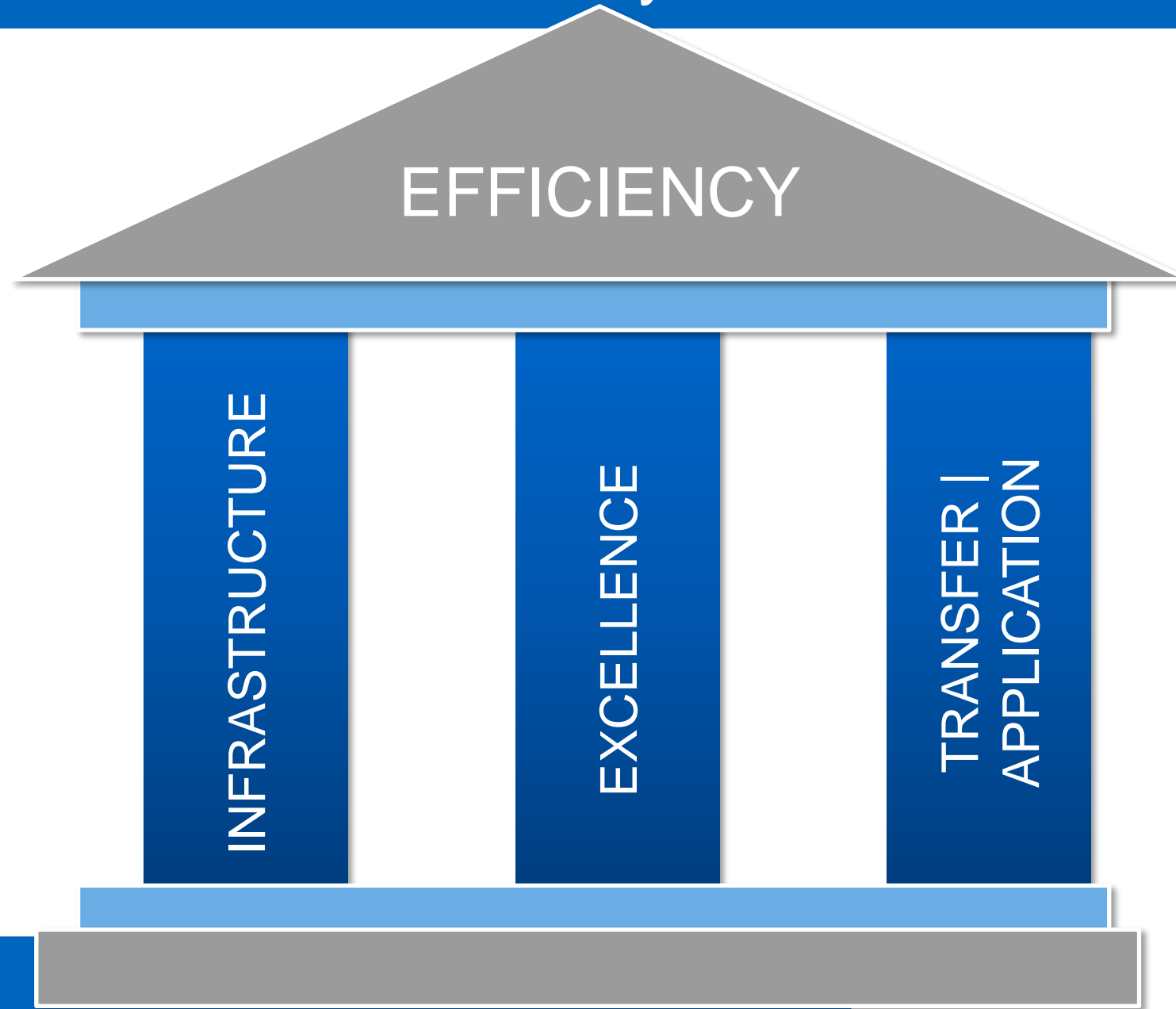
Linking excellence with applicability and applications of results

AI Eco-System for Manufacturing, but also **Smart Cities**, **Energy 4.0**, and **Health Care**:

- **250+** researchers and **100 Ph.D.** students
- **41 EU** projects, **61** national projects, **25** industrial contracts since 2018
- Budget 2022 – **501 mil. CZK (institutional funding DKRVO less than 3%)**
- Key partners: **DFKI (Prof. Wolfgang Wahlster) & INRIA**
- CTU recognized as **#5 in Computer Vision** and **#6 in Robotics in Europe** (2023)
- Networked inside the country and in Europe: Participation **in 4 of 6 EU Centers of Excellence (Vision, ELISE, TAILOR & EuRobin)**
- The core research facility: **Testbed for Industry 4.0** – a set of machines and algorithms which enable to build experimental flexible production lines and their parts, to develop, implement and verify novel solutions for Industry 4.0 needs

- **Key Project: Flagship RICAIP EU Project** (49 mil. EUR) - Teaming Program - **supports Testbed 4.0:**
4 founding partners: CIIRC, CEITEC BUT Brno, DFKI Saarbruecken, ZEMA Saarbruecken, new partners: Fraunhofer IWU Dresden, TU Ostrava
- **National Center of Competence „Cybernetics and AI“:** 9.0 mil. EUR for 4 years
Dissolved in 12/2022 by the Technology Agency of the CR
- Seat of the **National Center for Industry 4.0 – *No public subsidy***
- **European Digital Innovation Hub for AI (EDIH)** – starts these days
- **TEF – “AI-Matters:” Testing and Experimental Facility** – 1. Assembly meeting hosted by CIIRC last week
- Seat of the Central-European **CLAIRE, ELLIS, GAIA-X** and **IDSA** offices
- Instrumental in establishing the **AICZECHIA association**

Three Pillars of Efficiency



Three Pillars of Efficiency

Excellent Research Teams:
AI&Reasoning, IMPACT & R4I
2017–2023 | 16.5 M EUR total

**Member of the Networks of AI
Excellence Centres: ELISE,
TAILOR, VISION, and euROBIN**

INFRASTRUCTURE

Construction & Equipment

EXCELLENCE

Research Capacity Building
Strengthening European Partnerships

TRANSFER | APPLICATION

Towards Sustainability
Ecosystem Building

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
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CTU-CIIRC Project
2014–2017 | 58.3 M EUR

National Competence Centre:
**Cybernetics and Artificial
Intelligence**
2019–2022
12.2 M EUR total

RICAIP
2019–2026
49.8 M EUR total

EDIH CTU

AI-MATTERS
TEF for Manufacturing
60 M EUR total

ELIAS
11.3 M EUR total

Excellence | 3 Excellent Teams funded for 6 years

- Key researchers are highly respected personalities with excellent international track records.



Artificial Intelligence and Reasoning | 6 mil. EUR

AI&Reasoning

Josef Urban

ERC Grant Recipient



Intelligent Machine Perception | 5.2 mil. EUR

IMPACT

Josef Šivic

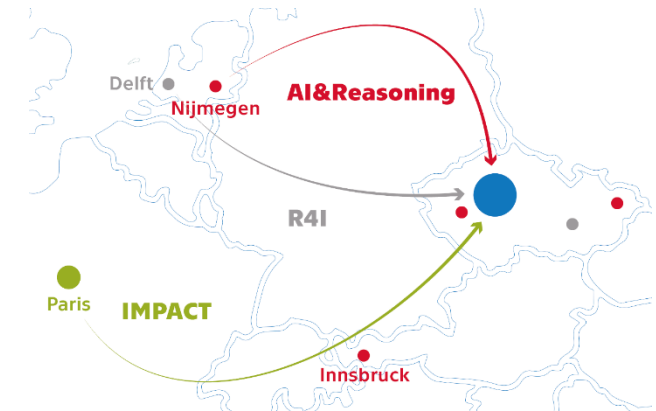
Double ERC Grant Recipient



Robotics for Industry 4.0 | 7 mil. EUR

R4I

Robert Babuška



Excellence | Researchers

These researchers attracted others to come



Tomáš Mikolov



Torsten Sattler



Mikoláš Janota (ERC CZ grant)

Excellent researchers from our “own resources”



Vladimír Kučera



Tomáš Vyhlídal



Tomáš Pajdla

Infrastructure | Testbed for Industry 4.0

- State-of-the-art experimental environment for distributed industrial production
- Inseparable part of the **RICAIP Centre**
- R&D – Innovation – Education
- **Technology:**

Reconfigurable assembly line with 6 robotic stations; 30+ robots, Flexible conveying system; Collaborative robots, Machining robots, Hybrid additive and subtractive Manufacturing, 3D printers (HP MJF, PolyJet...), Automatic warehouse, 5G, Robotic vision lab & more



Pavel Burget



Petr Kolář



Tilman Becker

Infrastructure | Besides the Testbed for Industry 4.0

Robotic and Computer Vision Center (Václav Hlaváč)

Mobile Robotics Lab (Libor Přeučil)

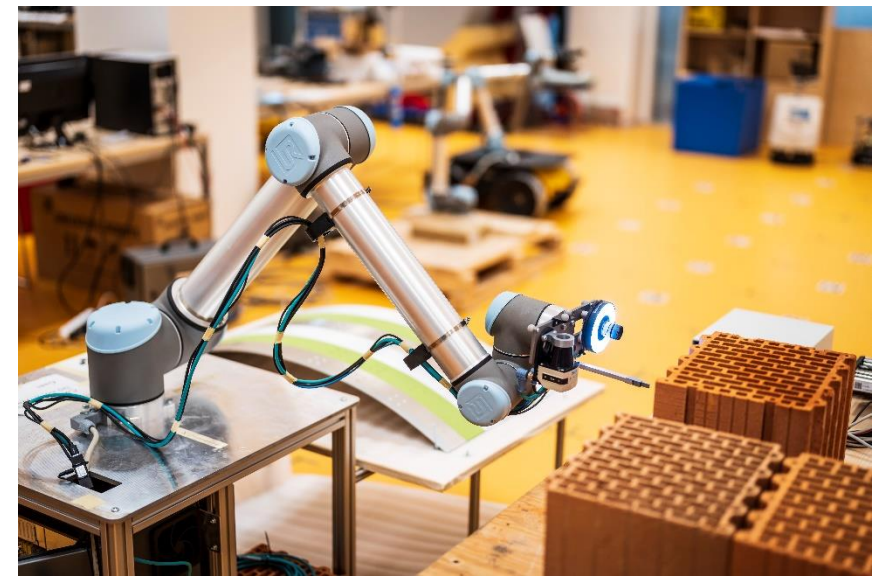
Autonomous Systems Lab (Zdeněk Hanzálek)

Smart Home and Assistive Technologies (Lenka Lhotská, Olga Štěpánková)

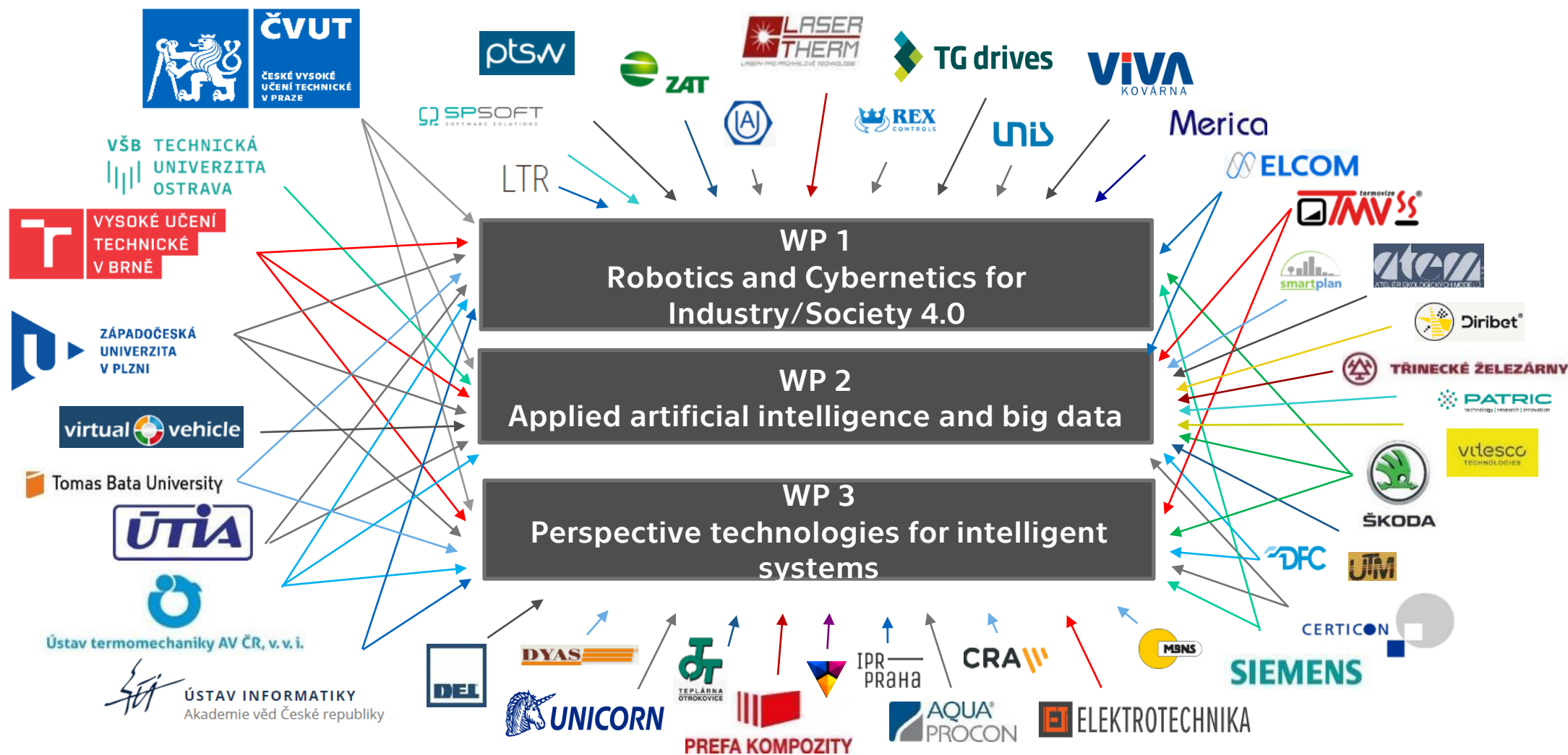
Center for the Cities of the Future (Michal Postránecký)

ŠKODA Auto Lab (Petr Bouchner)

Joint Research Labs with Eaton (Zdeněk Hanzálek) &
Rockwell Automation (Petr Kadera)



Transfer | National Competence Center *Dissolved in 12/2022*



T A Tento projekt je spolufinancován se státní
podporou Technologické agentury ČR v rámci
Programu Národní Centra kompetence.
Č R www.tacr.cz
Výzkum užitečný pro společnost.

National Competence Center NCC CAI, TN01000024

Ecosystem | National Centre for Industry 4.0



NATIONAL CENTRE
FOR INDUSTRY 4.0

Main Partners:

Academic Partners



Industrial Partners



SKODA

SIEMENS



National Partners



SDRUŽENÍ
AUTOMOBILOVÉHO
PRŮMYSLU



JIC



CONFEDERATION OF INDUSTRY
OF THE CZECH REPUBLIC



STŘEDOČESKÉ
INOVAČNÍ
CENTRUM

Partners:



THE
FUTURE
TECHNOLOGY

Deloitte.

ICUK

KUKA



Univerzita Tomáše Bati



Univerzita
obraný



Vysoká škola
logistiky
o.p.s.



ZÁPADOČESKÁ
UNIVERZITA
V PLZNI

Associated Partners:



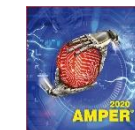
EVIDEN

JHV

Leuze



SICK
Sensor Intelligence.



CZECH
SIGHT



AUTOMA



CONTROL
ENGINEERING



Roklen 24



13

Collaborating Partners:

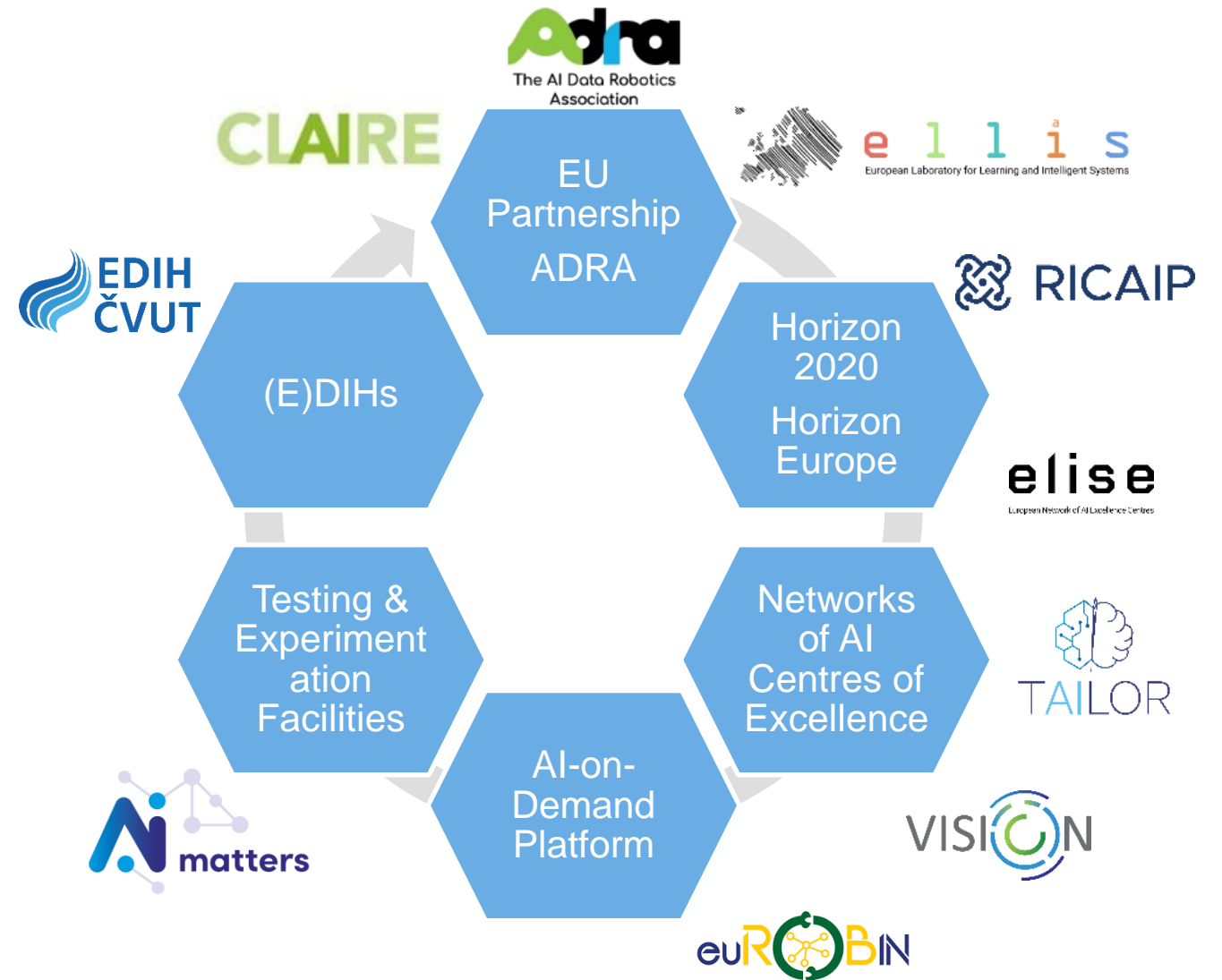
Members:

ACTUM Digital
ABRA Software
ČEZ DISTRIBUCE.
Continental Automotive
ELVIRA
Factoree.online
Festo
Lenze

K2 Machine
Novicom
OptiSolutions
PATRIC
Pocket Virtuality
Radalytica
Zebra Technologies
24 Vision

Aligned for the future: The European ecosystem of excellence in AI & Robotics

- In line with the “**Support from the lab to the market**” vision of the European Commission.
- CIIRC CTU is engaged across **the full range of supported areas**.
- CIIRC CTU’s engagement in projects and activities already provide a broad basis for securing a **strategic position in the European ecosystem of excellence in AI & Robotics** and delivering on this vision.
- CIIRC CTU participates in “**ELIAS: European Lighthouse of AI for Sustainability**”



Selected Results

- **Winner - Alexa Prize in Chatbot competition** (J. Šedivý 2022)
- Winner in **World competitions in Reasoning** (J. Urban, 2019-22)
- **Tomáš Pajdla** – 3 prestigious **best paper awards** in 4 years
- **Enhancement of efficiency** of pressing processes at **ŠKODA AUTO** using virtual reality
- **Production scheduling system for Airbus Industries** (used in 42 assembling lines)
- **Speeding-up production lines at LEGO**
- Integration of 5 robots in the welding cell saving 15% energy (in cooperation with **Blumenbecker**) – 6 applications for SMEs
- **Anti-covid half-mask** developed and prepared for manufacturing in a SME – **national and European awards**



- Strategy: **Excellence & Applications**
- Implementing Vision: **Networking accross the country and in Europe**
- **BUT: All the 3 Pillars of CIIRC activities have been strongly hit recently:**
- **Infrastructure Pillar:** CIIRC was dedicated to the idea to build **Large Research Infrastructure** (jointly with CEITEC BUT Brno & TU Ostrava) – **Ministry MŠMT decided NO NEW infrastructures for 6 years will be funded**
- **Transfer | Application Pillar:** National Center of Competence “Cybernetics & AI” resolved suddenly after spending 0,5 bil. CZK – Technology Agency of the CR **decided after non-transparent evaluation process**
- **Excellence Pillar:** The OP VVV projects are ending this month, **the expected continuation in the form of 2 OP JAK (Future AI & Robotics) - the Ministry MŠMT postponed the decision to early 2024 – the time gap in funding will impact not only us and might be killing for some really excellent teams!**

- We are facing a new challenge:
 - Switch from National Sources: Research & Transfer will be funded from EU, and especially by foreign sources (incl. India and Bhutan), they are eager to use our high-quality resources!
- Question remains:
 - How the Czech Republic wants to accomplish the society and industry transformation **without exploring the recently built Czech research capacities in AI and Industry 4.0** in Prague, Brno and Ostrava....?

Optimistic expectation at the end:

Czech Republic and the AI community will find the way!



Thank you for your attention!

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