

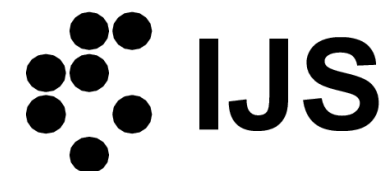
Control technologies

Miha Glavan



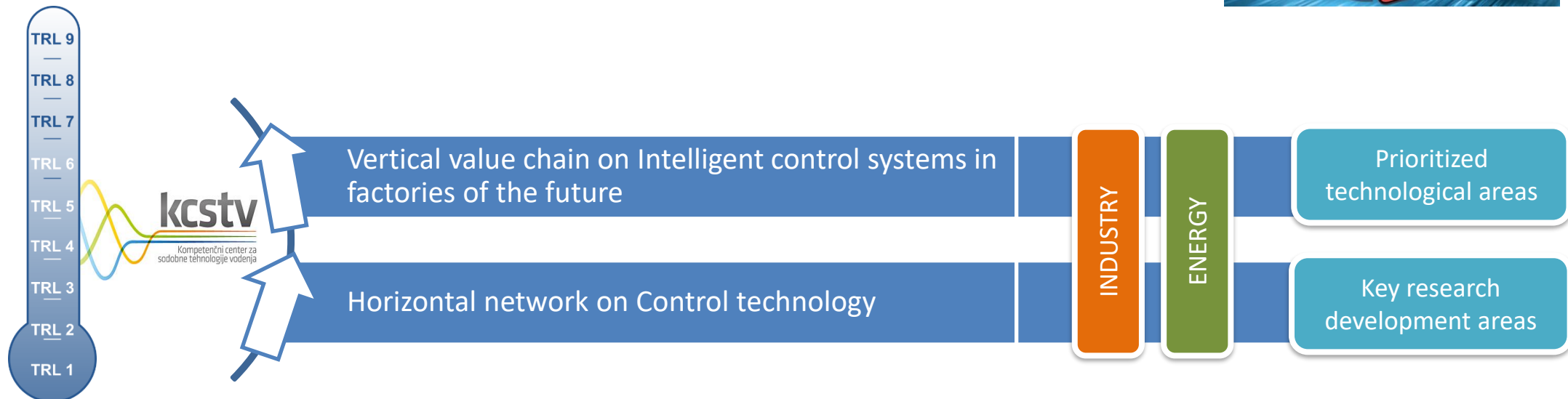
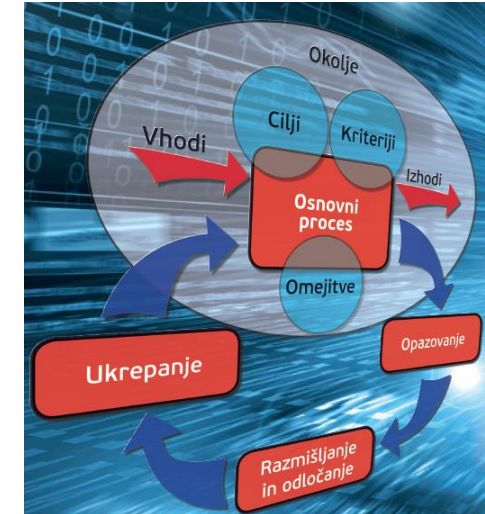
TECOS

Gospodarska
zbornica
Slovenije 



Field of control technology

Control technology (**automation, cybernetics, informatics**) is distinctive infrastructural **enabling technology** that is included in practically all modern devices, machines, processes and systems with the task of ensuring their **functionality, reliability, safety and operational efficiency**.



Key research development directions



New building blocks for
Integration physical and digital
world in factories of the future

- New generation of **sensors & communication interfaces**
- Development of autonomous software **agents self-learning abilities**
- Production **data spaces** and **secure data sharing**



Development of new procedures
for real-time monitoring and
management of production
processes

- New approaches **to extract hidden information** from measured data, identification of mathematical models
- Focus on: (i) **production models** for a specific product segment, (ii) agents for **insight into unmeasurable** (hidden) process states, and (iii) **predictive control and optimization**



Control technologies in green
energy solutions

- **Electrification** of technological processes
- Use of **hydrogen technologies** for storage, conversion, distribution and energy supply
- Development of **energy management** procedures including RES, energy conversion & distribution

Prioritized technological areas

Artificial intelligence for control and optimization of

systems

- Production **automatization**
- **Quality** and process control
- Optimization of **energy efficiency**
- **Adaptive** manufacturing
- **Workforce** management

Digital twins in technical processes

- **Reorganization** and **optimization** of production processes
- **Internal logistics** and **scheduling**
- **Connectivity** with the live data/process

Energetics in complex systems

- **Techno-economic optimization** of energy building blocks
- Industrial participation in **grid balancing**
- **Hydrogen prosumer** and renewables

Predictive maintenance

- **Detecting changes** in equipment function
- Monitoring the **condition** of equipment/machinery
- Estimation of **indicators** of **equipment** wear and tear
- Supporting **maintenance planning**

Industrial IoT

- New **IIoT solutions** for data collection, analysis and distribution
- Data collection, **AI integration**, remote management and **improved control** of processes

Integrated MES

- Flexible **data integration** and data management
- Improved **functional integration** with other production IT systems
- Development of **new MES/MOM functionalities** (quality, scheduling, maintenance, ...)

Autonomous mobile systems*

- **autonomous logistics** in spatially limited areas
- **internal logistics** and
- autonomous **adaptation of production lines**
- environmental monitoring

*joint topic with robotics

Internationalization activities



EFFRA & MiE

Involved as EFFRA member, represented in MiE members board and WGs



A.SPIRE & Processes4Planet

Involved in transversal Digital working group, Energy working group and Process optimization working group.



Hydrogen EUROPE & CLEAN Hydrogen Partnership

Involved in the area of green hydrogen.



Vanguard Initiative

Member of AI Pilot and in the process of joining to a new hydrogen pilot.

Other

UNIDO AIIM Global Alliance, CIRP



Tehnološki park 18, 1000 Ljubljana, Slovenia

W: www.kcstv.si E: info@kcstv.si