INNOVATION OBJECTIVE

The applied research / innovation objective of the project is to

strengthen the ability of SZTAKI and the two faculties of BME to transfer the research results to the industry with the support of the participating FhG institutions under the coordination of NKFIH.

Scientific excellence will be achieved by high level research activities in the field of CPPS, generally and in specific subtopics as Research Fields (RFs):

RF1: Planning and management of cooperative and adaptive production and logistics networks.

RF2: Situation-aware, resource efficient and robust production planning and control (including maintenance).

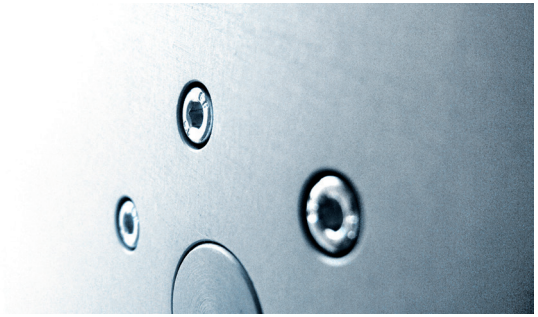
RF3: Extensively monitored, controlled and pluggable machine tools and manufacturing systems.

RF4: Advanced technologies for flexible production systems.

RF5: Collaborative robotics, human-robot symbiosis.

RF6: Robust cooperative and coordinated control in cyber-physical systems.

RF7: Supporting technologies: Cloud-based service and pilot CPS in the field of production and logistics.



Participants:

Nemzeti Kutatási, Fejlesztési és Innovációs Hivatal

National Research, Development and Innovation Office (NKFIH) - Hungary

MTA **SZTAKI**

Institute for Computer Science and Control, Hungarian Academy of Sciences (SZTAKI) - Hungary

MŰEGYETEM 1782

Budapest University of Technology and Economics (BME) - Hungary

- Faculty of Mechanical Engineering (GPK)
- Faculty of Transportation Engineering and Vehicle Engineering (KJK)

Fraunhofer

Fraunhofer-Gesellschaft (FhG) - Germany

- Fraunhofer Institute for Manufacturing Engineering and Automation (IPA), Stuttgart
- Fraunhofer Institute for Production Technology (IPT), Aachen
- Fraunhofer Institute for Production Systems and Design Technology (IPK), Berlin

Fraunhofer Austria Research GmbH (FhA) - Vienna

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EPIC CENTRE OF EXCELLENCE Production Informatics and Control

CENTRE OF EXCELLENCE IN PRODUCTION INFORMATICS AND CONTROL

EPIC CENTRE OF EXCELLENCE
Production Informatics and Control

OBJECTIVE

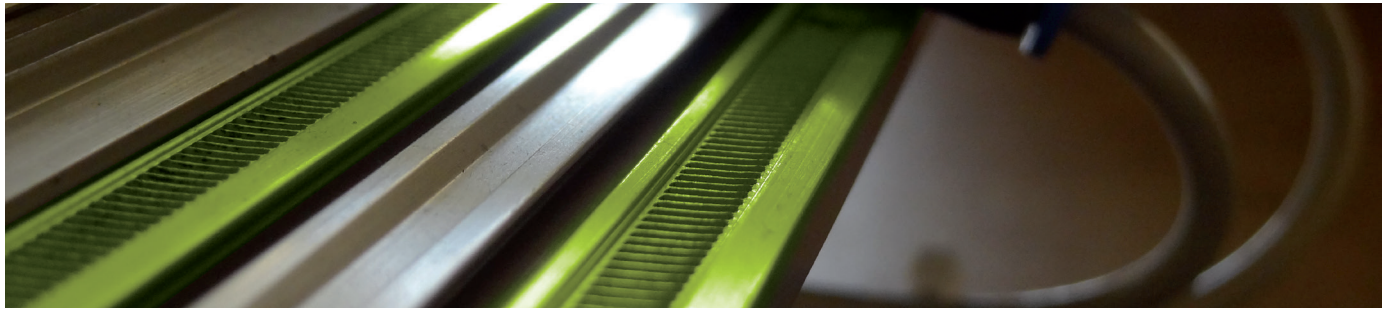
The main, overall objective of the project is to establish the Centre of Excellence in Production Informatics and Control (EPIC) as a leading, internationally acknowledged focus point in the field of production informatics, management and control representing excellence in research, development and innovation (R&D&I).

PARTNERS

EPIC will be constituted and run through the cooperation of the Institute for Computer Science and Control, Hungarian Academy of Sciences (MTA SZTAKI), two faculties of the Budapest University of Technology and Economics (BME) and four institutions of the Fraunhofer-Gesellschaft (FhG) under the coordination of the National Research, Development and Innovation Office (NKFIH), Hungary as a national authority responsible for research, technology and innovation.

GOALS

- Developing strategic partnerships between outstanding research centres of the so called – from R&D&I viewpoint – high and low performing Member States.
- Strengthening the R&D&I management potential.
- Increasing the human potential.
- Elevating the level and broadening the scope of the technology potential.
- Increasing the R&D&I visibility and international reputation.
- Improving responses to socio-economic needs of Hungary and also Central and Eastern Europe.



STRUCTURE

The new EPIC CoE is conceived as a synergic combination of

- MTA SZTAKI as an existing Centre of Excellence of the EU in Information Technology, Computer Science and Control whose current primary research profile focuses on cyber-physical systems and which is to be upgraded by deepening its basic competency in fundamental research and strengthening its reputation in the applied research; and
- EPIC Technology Transfer Ltd., a new legal entity to be established in Hungary on the basis of enhancing the already existing Fraunhofer-SZTAKI Project Centre for Production Management and Informatics (PMI) that has been formed in 2010 in collaboration with IPA, Stuttgart and FhA, Vienna. In the future, two additional institutes of FhG, i.e., IPT, Aachen and IPK, Berlin will be included into the cooperation.
- Furthermore, the former academic relationships between SZTAKI and BME have been formalised by inviting two faculties of the BME, i.e. GPK and KJK into the consortium.
- The close cooperation with small and medium sized enterprises (SME) as well as with large industrial firms.

However, for the outside world, EPIC should appear as a single integrated entity acting coherently and uniformly on all forums and in all its spheres of interest.

SCIENTIFIC OBJECTIVE

The main objective of the project is to further strengthen/upgrade SZTAKI's – as existing Centre of Excellence – research potential, in the field of Cyber-Physical Systems (CPS), especially of Cyber-Physical Production Systems (CPPS). These are systems of collaborating computational entities in intensive connection with the surrounding physical world and its on-going processes, providing and using, at the same time, data accessing and data processing services available on the internet.

The expectations towards CPS are versatile and enormous: increased robustness by means of decentralized decision making & autonomy, self-organization, self-maintenance, self-repair, transparency, predictability, efficiency, interoperability, global tracking and tracing, to name only some of them. Though there are very important developments in cooperative control, multi-agent systems (MAS), complex adaptive systems (CAS), emergent systems, sensor networks, data mining, etc., even a partial fulfilment of these expectations represent real challenges for the research community. SZTAKI's traditional basic research directions, i.e., computer science, systems and control theory, engineering and business intelligence, machine perception and human-computer interactions, all point towards CPS.

Consequently, the scientific objective of the project is:

Design, control and management of robust, cooperative systems in the cyber-physical world.