

Hungarian Academy of Sciences Computer and Automation Research Institute

MTA SZTAKI About The Institute

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The Mission

*To attract outstanding scientists (their students and teams) who specialize in computing and automation;
To provide them with a multidisciplinary environment in order to stimulate outstanding research and development;
To have the resultant state-of-the art technology transferred to academia, governments and industry world-wide*

Chairman of Board of the Institute: **Dr. Tibor Vámos**, academician

Director: **Dr. Péter Inzelt**

Deputy Directors, Research: **Dr. József Bokor** academician, **Dr. László Györfi** academician, **Dr. László Monostori D.Sc.**,

Head of Scientific Council: **Dr. Tamás Roska**, academician

Deputy Director, Finance: **Mária Bánné Mészáros**

Board of the Institute (also members of Hungarian Academy of Sciences): **Dr. László Lovász**, **Dr. Pál Michelberger**, **Dr. László Papp**, **Dr. Domokos Szász**, **Dr. Vera T. Sós**, **Dr. Róbert Tuschák**.

MTA SZTAKI is the Hungarian acronym for "The Computer and Automation Research Institute, Hungarian Academy of Sciences".

The Institute was founded in 1964. Its staff consists of more than 300 full-time employees, more than 200 with university diploma and more than 70 with scientific degrees.

The fundamental task of the Institute is to perform basic and application oriented research in an interdisciplinary setting in the field of computer science, engineering, information technology, intelligent systems, process control, wide-area networking and multimedia.

Contract-based target research, development, training and expert support for domestic and foreign industrial, governmental and other partners are important activities of the Institute.

The Institute's mission includes the transfer of up-to-date research results and state-of-the-art technology to university students. The Institute is very active in graduate and postgraduate education, cooperating with most technical universities in Hungary and operating common chairs, post-graduate programs with them. More than 40 members of the Institute's researchers conduct regular lectures/classes at graduate and post-graduate level and senior researchers hold part-time position as university professors. 40-50 Ph.D. students and 30-40 graduate students participate in the work of **MTA SZTAKI**.

External relationships of the Institute

The Institute has wide external relationships in its R & D profile. ERCIM (European Research Consortium of Informatics and Mathematics) granted full membership to the Institute in 1994. The Institute is a member of the (World Wide Web) W3 Consortium led by the Massachusetts Institute of Technology (MIT), of the European Software Institute and of other international organizations. Our Institute won the title of "Centre of

Excellence" in the 5th Framework Program of the European Union, and is participating in many research projects of this program.

Operating Strategy

All units at the Institute operate as individual profit centers; the basic research activity is financed from budget subsidy.

The applied research and development activities live from revenues derived from commercial contracts and research grants.

Virtual Institutes and Research Centers

In the EU the concept of supporting the collaboration of research groups working at different Institutions on specific topics is a new emphasis, called virtual research centers. MTA SZTAKI has joined forces in this pioneering endeavour with a number of Research establishments in Hungary, as well as in the EU.

The Institute is participating in three such Centers:

- In the field of *Production and Business Management* The Engineering and Management Intelligence Laboratory of MTA SZTAKI has joined forces with Fraunhofer Institute for Manufacturing Engineering and Automation of Germany.
- Twelve establishments including five Universities form *The Virtual Research Centre in Info-Bionics*; one of the founding members is the Institute's AnaLogic & Neural Computing Laboratory of the Institute.
- The Institute's Laboratory of Parallel and Distributed Systems is also a very active and early member of the (computer) *Grid Consortium*

The Institute As A High-Tech Company

Contract-based target research, development, training and expert support for domestic and international industrial, governmental and other partners have been some of the key activities of the Institute.

The Institute's research and development activity aims primarily at creating custom-designed computer-based applications, implementing the related software and providing turn-key systems. Our scientists and engineers have the necessary field-specific expertise (theoretical, technological and methodological experience) by which they can complete - in close co-operation with potential users - the functional plan of the system to be implemented, followed by software design and system development. The Institute undertakes the teaching in and training of users, system installation and supervision in the starting phase of operation, as well as the follow-up of its software products.

The main fields of applied research and development are:

- artificial intelligence methods in medical diagnostics, in process control, in mechanical engineering and in the field of financial mathematics,
- expert- and knowledge-based systems in medicine and in process supervisory systems,
- design and application of CNN algorithms for high-speed image detection, e.g. for evaluation of mammograms, echo-cardiograms in the field of medicine, video compression techniques, cryptographic procedures,
- robust control, simultaneous identification and control, signal processing methods and their application in diagnostics and control of industrial processes and in integrated vehicle control system,
- computer-aided design, reverse engineering, computer integrated and intelligent manufacturing systems,
- distributed information systems and management,
- groupware and decision support systems,
- new technologies for local and wide area networks,
- World Wide Web systems and services, multimedia tools,
- digital libraries,
- software quality assurance,
- Cluster and grid computing

Quality is an important issue at the Institute: we have an ISO 9002 certification and a BOOTSTRAP quality assurance system for SW-development.

Through numerous EU-grants, researchers of **MTA SZTAKI** contribute extensively to European scientific co-operation projects. The Institute was the first in Central Europe to obtain an ESPRIT Basic Research Grant.

Different groups within our Institution are working on projects with or for such national and international agencies as CERN - European Organization for Nuclear Research, General Electric, Harvard University, Knorr-Bremse AG., MATÁV Rt. - The major Hungarian Telecommunication Company, MOL Rt. - The Hungarian Oil Company, NASA - National Aeronautic and Space Administration (USA), National Film Archive of Hungary, OMFB -The National Committee for Technological (Hungary), ONR - Office of Naval Research (USA), Paks - the Hungarian Nuclear Power Station, Siemens Framatom AG University of California at Berkeley, University of Minnesota, University of Westminster (UK), Akita Prefictural Industrial Technology Center etc. Our senior researchers are very active in the management and in the working committees of various international scientific organizations. Many researchers are members of editorial boards of leading international scientific periodicals.

The Institute is stable, independent partner in R&D and in the field of contract-based applied work, as system planning, system integration, consulting, and turn-key information systems



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