

Advanced Research Collaborative Laboratory

The lecturers at Toyohashi University of Technology collaborated with researchers from domestic and international research organizations that boast a high standard of research to establish the Advanced Research Collaborative Laboratory. The goal of this was to allow us to pursue research in a specific research field for a fixed period as well as improve the sophistication and variety of research here at our university.

AIST-TUT Advanced Sensor Collaborative Research Laboratory

Directors

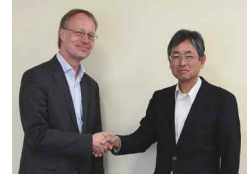
- National Institute of Advanced Industrial Science and Technology (AIST)
Shiro Hara
- Toyohashi University of Technology
Kazuaki Sawada



TUT-ISYS (Institute for System Dynamics, University of Stuttgart) International Cooperative Research Laboratory for Advanced Systems Engineering

Directors

- University of Stuttgart
Oliver Sawodny
- Toyohashi University of Technology
Naoki Uchiyama



Research Institute

Electronics-Inspired Interdisciplinary Research Institute (EIIRIS)



Kazuaki Sawada
Director

Determined to become a world leader in development and interdisciplinary research

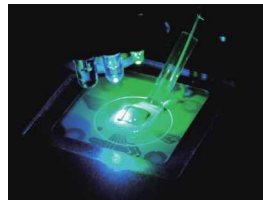
The Electronics-Inspired Interdisciplinary Research Institute (EIIRIS) was established in October 2010 as Toyohashi University of Technology's first research institute to explore the technological sciences and their applications. More specifically, EIIRIS's objectives are to develop interdisciplinary research of smart sensing, photonics information devices, and other innovative electronics technology and their advanced application in fields such as robotics, telecommunications, the life sciences, agricultural engineering, environmental science, and disaster prevention.

In April 2019, EIIRIS expanded its research structure from the existing two research disciplines to five, signaling the start of research and development in new interdisciplinary.



Innovative Sensor Technology

We have realized various devices utilizing accumulated design and fabrication technologies for sensors, MEMS and LSI that have been highly regarded worldwide. We will promote the creation and demonstration of innovative sensors and MEMS devices while collaborating this strength with materials research institutes and applied research institutes.



Innovative Applied Sensing Technology

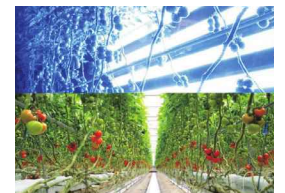
Our research interests include human cognitive functions and mechanisms behind the interpersonal communication and human-robot interaction by utilizing multidimensional information, e.g. human behavior or brain activities, acquired by multimodal advanced sensors.



Advanced Agricultural Engineering

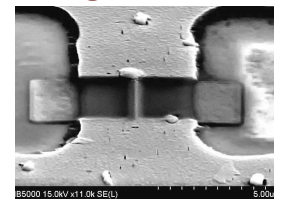
Focusing on the development of sensor-based plant diagnosis techniques (Chlorophyll fluorescence imaging, volatile organic compound measurement, photosynthesis and transpiration

measurement etc.) for agricultural production under environmental control such as intelligent greenhouse and plant factory.



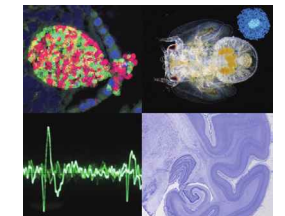
Advanced Environmental Sensing

Our group is developing low-noise Josephson junctions and highly sensitive SQUID magnetometers for application of nondestructive inspection and ultra-low field MRI. We are also studying optimization of terahertz-wave sensor arrays such as microwave kinetic inductance detectors.



Advanced Life Sciences

Our research focuses on understanding cellular and molecular basis that underlies inter- and intraspecies interactions, behavior, and neuronal function of organisms, along with developing innovative electronic devices.



Venture Business Laboratory (LSI Factory)

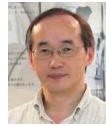
Our LSI Factory, where you can learn everything there is to know about semiconductor integrated circuits

Our LSI Factory, where we do everything from design to the production and evaluation of semiconductor integrated circuits, has some of the world's best equipment. We are pursuing research and education into the development of integrated, intelligent devices, which combine semiconductor integrated circuits (IC, LSI) with sensor technology and nanotechnology.



Research Center

Center for Human-Robot Symbiosis Research



Michio Okada
Director



Toward a society where people and robots can coexist at high level and fruitfull lives, we are developing various type of service robots such as welfare robots that perform walk training and physical support, harvest support robots, intelligent lighting systems, etc. And we are conducting researches on human-robot symbiosis technologies based on the weak-robots concept, socally assistive robot technologies, and novel acutuators using ultrasonic motor.

Research Center for Agrotechnology and Biotechnology



Sensing technology



A plant farm that uses artificial light



Toshihiko Eki
Director



Environmental protection system

This center was established for applying a range of our engineering technologies to agriculture. The center members, full-time specifically appointed professors as well as researchers in different departments, are collaborating and conducting research into agriculture, sensing systems, biotechnology, and the environment.

We are also developing human resources for agriculture by conducting three training courses, the Frontier Plant Factory Manager, the Frontier Course in IT for Land-utilizing Farming, and the Training Program for Sixth Sector Industrialization, respectively.

Research Center for Collaborative Area Risk Management (CARM)



Taiki Saito
Director



At our center, we conduct research into disaster prevention in the community and risk reduction in local areas by looking not just at natural disasters, but also at risks on a broader scale in the environment and everyday living. For this reason, we cooperate closely with local administrations, industries, and community groups, and through cross-collaboration with professors in related fields, we are endeavoring to develop technology and put our project aimed at reducing risk into practice. We are also striving to ensure the results of our research continue to benefit the community, and to establish a base for general academic research to contribute to creating a safe community full of vitality.

Research Center for Future Vehicle City



Wireless electric vehicle

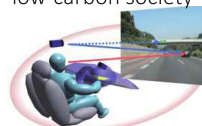


Takashi Ohira
Director



We are taking on the following research topics to create the sustainable vehicles of the future with a reduced carbon footprint:

- 1) Research into a city where low-carbon electric cars are the main form of transport
- 2) Research into a city which is safe and secure for vulnerable road users
- 3) Energy-saving technology and new systems that would support a low-carbon society



RESEARCH ADMINISTRATION CENTER



Saburo Tanaka
Vice President
(Research Enhancement)
Deputy Director of
Research Institute for
Technological Science and Innovation
Director of Research
Administration Center

In December 2013, after we became part of the Ministry of Education, Culture, Sports, Science and Technology's Program for Promoting the Enhancement of Research Universities, we established the Research Administration Center (RAC) at Toyohashi University of Technology. It oversees the strategic planning and management of all of our research that will serve to produce research results that will change the world.

At the RAC, our University Research Administrators (URA), who are well-versed in our university's education and research development and have sufficient knowledge of the community's needs, and Science and Technology Coordinators for the collaboration between universities, industry and government are responsible for the following jobs: 1) Basic research topics that should be covered and the course of action required for collaboration between our university, various companies, and

government organizations, 2) Research strategies and proposals to expand our university's research facilities to achieve the above, 3) The planning and proposal of large research projects that involve university lecturers, 4) Office support for managing industry-academia collaborative research and acquisition of competitive funding, 5) Management of intellectual property creation, 6) International promotion of research results and outreaching activities including the planning of consortiums, 7) Tasks including the management of all contracts and the risk management for industry-academia collaboration, 8) Promoting the effective use of shared equipment throughout the school.

In this way, the RAC supports the research activities pursued by the Research Institute for Technological Science and Innovation (RITI). Especially regarding Strategic Research, the RAC will strongly support the activities by building bridges with companies from the initial topic recruitment stages and maximizing the output of post-written theses, intellectual property, and licensing.

Research Administration Center (RAC)

Office for Research Strategy

- Analyses trends in academic research, scientific policies, society's needs, university potential in Japan and overseas, determines an overall research strategy and presents these ideas to the Strategic Planning Committee.
- Determines and implements programs for the continuous development of URAs (University Research Administrators).

Office for Promotion of Industry-Academia Collaboration

- Proposes policies for the further pursuit of interdisciplinary research to create new value with industry-academia-government at its core.
- Supports acquisition of competitive funding for projects with a large impact.
- Offers overall support from the creation to the acquisition of rights and applications of intellectual property, and supports collaborative activities involving intellectual property.
- Employs experts in international patents and international law to meet the global requirements concerning patents and contracts.

Office for Risk Management of Industry-Academia Collaboration

- Manages issues such as conflicts of interest, confidential information management and security export control in order to facilitate industry-academia collaboration.

Office for Technology Support Service

- Manages the university's shared equipment and provides support for interdisciplinary research by employing experts and lecturers with highly-specialized skills.

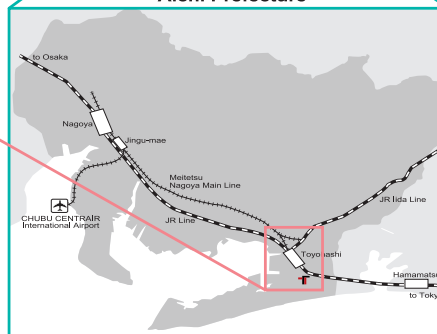


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