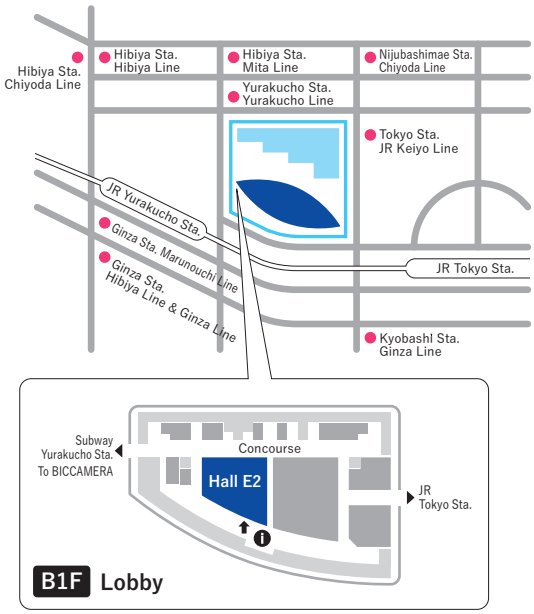
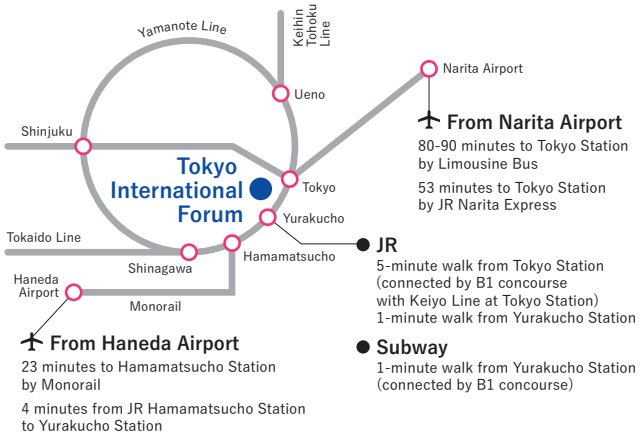
ACCESS

Tokyo International Forum
B2F (Hall E2)

3-5-1 Marunouchi, Chiyoda-ku, Tokyo, Japan
Tel: +81-3-5221-9000





From Narita Airport
80-90 minutes to Tokyo Station by Limousine Bus
53 minutes to Tokyo Station by JR Narita Express

JR
5-minute walk from Tokyo Station (connected by B1 concourse with Keiyo Line at Tokyo Station)
1-minute walk from Yurakucho Station

Subway
1-minute walk from Yurakucho Station (connected by B1 concourse)

From Haneda Airport
23 minutes to Hamamatsucho Station by Monorail
4 minutes from JR Hamamatsucho Station to Yurakucho Station

Organized by

Keio Leading-edge Laboratory of Science and Technology (KLL)

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Supported by Nikkan Kogyo Shimbun Ltd.

www.kll.keio.ac.jp/ktm

19th Annual Keio Science and Technology Exhibition

KEIO TECHNO MALL 2018

Beyond imagination
– March towards the future

12.14 FRI
10:00-18:00

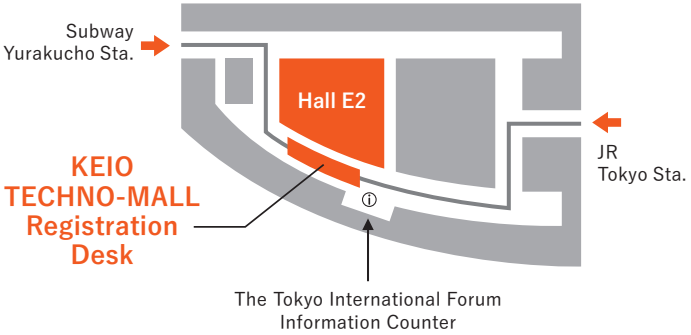
Admission Free

Tokyo International Forum B2F (Hall E2)

For the floor map,
please refer to the facing page at the beginning.

Floor Map

B1F Lobby



- Materials
- Society & Environment
- Biomedical
- Mechanics
- Electronics
- Information and Communication
- Other Fields
- Group Exhibition Zone: Chemistry and Biology
- Medical-Engineering Collaboration Zone

KEIO TECHNO-MALL provides four platforms

Encounters with researchers and subjects of research

〔1〕

You can be sure of unexpected encounters
and first-hand information otherwise unattainable on the internet.
More than just topics related directly to your own products
or business, perhaps, you will find subjects of research
with prospects for new business expansion.

Expanded scope and greater flexibility

〔2〕

By learning about the actual research at exhibition booths,
talking directly with the researchers and feeling actual objects,
you will be able to get a real feeling for the expanse
of possibilities. Also, with regard to collaboration with universities,
Keio Leading-edge Laboratory of Science
and Technology (KLL) will respond flexibly to requests
for advice about procedures and contractual aspects.

Publicizing of research results

〔3〕

With the KEIO TECHNO-MALL being a venue for the objective
and academic publication of research results,
you can demonstrate the outcomes of industry-academia collaboration,
and you can utilize it for business expansion.

Search for product / technology possibilities

〔4〕

Proposals for the utilization of your products and technologies
in helping research are also very welcome.
The KEIO TECHNO-MALL provides a platform
for linking to the development of new products and technologies
amid the flow of people, objects, funds and information.

KEIO TECHNO MALL 2018

Program of Events
Outline of Exhibits

Event Information

Venue Event Stage

Main Event

13:30-14:30

Special Interview

Expectations for Keio-originated technology:
Toward dreams

Sunday evening TV dramas uplift people heading to work the following morning. Among the best of these dramas are those that deal with developing new technology, which present inspirational themes involving dreams, skills, courage, and challenges. Katsuo Fukuzawa, who has produced many TV dramas that have inspired viewers, appears as a guest to share his thoughts on the challenges of developing new technologies, and the expectations he has in the Keio FST.

FUKUZAWA, Katsuo
Tokyo Broadcasting System Television Inc.,
TV Production division,
Director of Drama & Movie

Coordinator / Chairperson:
ASAKURA, Kouichi
Professor, Dept. of Applied Chemistry,
Faculty of Science and Technology

Round-table Session I

11:15-12:45

Using AI that goes beyond play:
Can AI really achieve results?

Artificial intelligence (AI) showing a dramatic spread by the advent of deep learning has an enormous impact on routine tasks such as image recognition. In many fields, AI is no longer a state of the art, but it is becoming more commoditized. However, treating AI as a "black box" and applying it without direction only leads to failure. Under such circumstances, in order to truly make use of artificial intelligence for research and development and business, it is necessary to understand what kind of task assignment and what type of artificial intelligence technology to apply. This session will invite the leading experts who are active in industry and medical application fields to discuss what kinds of strategies should be established for the effective application of AI.

ISHIKAWA, Shigeki
Sr. Manager,
Academic Advocate,
Research & Development
Japan, IBM Japan, Ltd.

MORI, Masaya
Executive Officer, Rakuten, Inc.
Global Head, Rakuten Institute of Technology Worldwide
Director, Rakuten life Tech Lab.
of Rakuten Life Insurance

SHIMIZU, Ryo
President, GHELIA Inc.

JINZAKI, Masahiro
Professor and Chairman,
Dept. of Radiology,
Keio University School
of Medicine

Facilitator:
SAKAKIBARA, Yasubumi
Professor, Dept. of Biosciences
and Informatics,
Faculty of Science and Technology

Round-table Session II

15:00-16:30

Future technologies are just around the corner!

With attention focused on the 2020 Tokyo Olympics, this session invites the participation of leaders in the automotive, information and communication industries, which are poised to trigger the top technological innovations. The session will cover future technologies and the importance of collaboration in developing them. To promote open innovation, which is reputed to be difficult in terms of producing successful results in Japan, the discussion will aim at finding missing pieces that promise to be key for industry and universities to achieve success.

SHINOHARA, Hiromichi
Chairman of the Board,
Nippon Telegraph and
Telephone Corporation

NAKAMURA, Tomomi
President and
Chief Executive Officer,
Subaru Corporation

KURODA, Tadahiro
Professor, Dept. of
Electronics and Electrical
Engineering, Faculty of
Science and Technology

SUZUKI, Tetsuya
Professor, Dept. of
Mechanical Engineering,
Faculty of Science
and Technology

ASAKURA, Kouichi
Professor, Dept. of
Applied Chemistry,
Faculty of Science
and Technology

Facilitator:
YAMANAKA, Naoaki
Professor, Dept. of Information
and Computer Science,
Faculty of Science
and Technology

For Event Schedules, please refer to the end.

*Please note that content, etc. of events are subject to change due to unavoidable circumstances on the day of the exhibit.

〔Outline of Exhibits〕

☐ Special symbols used in the following exhibition descriptions

Keio Patent — Technology involving patent rights held by Keio University. For further information, please inquire at the KLL Desk.

Short Presentation — Short Presentations; See last page for the timetable.

KIF Research Project — Research Project at Keio Innovation Foundry (KIF) as one of Keio University Faculty of Science and Technology 75th Anniversary Commemorative Project. For further information, please see KIF web site.
http://www.kll.keio.ac.jp/kif/

Materials

Materials | Medical / Welfare

BOOTH 5

Development of next-generation medical equipment using diamond-like carbon thin film

Professor **SUZUKI, Tetsuya**
Department of Mechanical Engineering

In recent years, development of materials with excellent biocompatibility has been desired with the development of medical technology. Our laboratory focused on the biocompatibility of diamond-like carbon (DLC) thin film and has developed medical-friendly medical devices. In this exhibition, we will introduce the possibility of DLC as a biocompatible material and the result of various medical device development in our laboratory.

Materials | Environment

BOOTH 6

Ultrafine microfluidic reactor for fine synthesis of sub-nanocluster materials

Professor **NAKAJIMA, Atsushi**
Associate Professor **TSUNOYAMA, Hironori**
Department of Chemistry

Ultrafine microfluidic reactors have been developed for fine chemical synthesis of ligand-protected sub-nanocluster materials. Microscopically uniform reaction field for chemical reaction under microfluidic mixing enables us to yield sub-nanoclusters size selectively. We advertise advantages of ultrafine reactors and application of sub-nanoclusters for catalysis.

Materials | Environment

BOOTH 7

Dry synthesis system for sub-nanocluster materials: nanojima®

Professor **NAKAJIMA, Atsushi**
Department of Chemistry

Sub-nanoclusters composed of several to tens of atoms are promising functional units for future materials science, because of their tunable functionality by size-parameters (number of atoms) in addition to chemical compositions. We have developed a large-scale synthesis system, nanojima®, based on a dry synthesis method toward a goal of sub-nanocluster materials sciences. We advertise features of nanojima method and recent progress of sub-nanocluster materials science.

Materials | Industry

BOOTH 8

High-performance Optical Device Fabricarion

Keio Patent KIF Research Project

Professor **YAN, Jiwang**
Department of Mechanical Engineering

We develop new fabrication technologies for nano-precision free-form optics and their molds by using multi-axis numerical control ultraprecision machines. High-speed surface finishing of optical crystals, such as Si, Ge, ZnSe, CaF_2, etc. has been realized by ductile machining technology. Recently, we also succeeded in fabricating ultra-thin Si-HDPE hybrid lenses for future IR devises.

Materials | Industry

BOOTH 9

Nano-Processing of New Materials

Keio Patent KIF Research Project

Professor **YAN, Jiwang**
Department of Mechanical Engineering

We develop new technologies for nano-scale processing and surface property control of materials in order to improve the functional capability and added value of industrial products. We deal with super hard alloys, ceramics, semiconductors, glass, diamond, CFRP, and so on. Recently, we have succeeded in generation of silicon nanostructures by laser irradiation on waste silicon sludge to produce high-performance lithium-ion batteries.

Materials | Environment

BOOTH 10

Non-woven fabric with oil-water separation

Professor **SHIRATORI, Seimei**
Department of Applied Physics and Physico-informatics

Non-woven fabric with oil-water separation function is demonstrated.

Materials | Industry

BOOTH 11

Antifouling coating to promote recycling of plastic

Professor **SHIRATORI, Seimei**
Department of Applied Physics and Physico-informatics

We demonstrate newly developed recyclable plastic film utilizing the biomimetic coating process. (1) Newly developed anti-fouling coating showed easy removal characteristics against water-based solution. In addition, it was found that the coating preserves the beer foam (bubble) for long time. (2) Oleophobic coating that shows anti-adhesive characteristics for whipped cream will be also demonstrated.

Materials | Medical / Welfare

BOOTH 12

Biomedical and information devices Integrated with micro/nano-scale functional materials

Keio Patent Short Presentation

Associate Professor **ONOE, Hiroaki**
Department of Mechanical Engineering

By using microfabrication and microfluidic technologies, we are developing novel functional microdevices integrated with nanoscale materials such as hydrogels, colloidal crystals, CNT and graphene. Our functional devices could be applied to in vitro tissue reconstruction for regenerative medicine, biochemical sensors for healthcare and environment monitoring, hydrogel microactuators, and reflective displays.

Materials | Medical / Welfare

BOOTH 13

sensor for human health care

Professor **SHIRATORI, Seimei**
Department of Applied Physics and Physico-informatics

We exhibit
1. Flexible and compact pressure sensor
2. Paper base chemical sensor for vitamin C sensing
3. Gas sensor usable under mixed gas environment

Society & Environment

Society & Environment | Environment

BOOTH 14

Promotion of energy saving by anti-adhesion coating

Keio Patent

Professor **SHIRATORI, Seimei**
Department of Applied Physics and Physico-informatics

1. High temperature liquid repelling surface which are bio-compatible
2. The coating with frost-resisting property is presented.
   This coating can be applicable for various kinds of substrates.
3. The wettability controlled functional thin film for the improvement of condensation heat transfer coefficient is presented.

Society & Environment | Society / Infrastructure

BOOTH 15

Analysis of driver cognitive and behavioral characteristics, design and evaluation of human machine interface

Professor **DAIMON, Tatsuru**
Department of Administration Engineering

We study the advanced driving safety assistance systems with in-vehicle/roadside information, warning and human machine interface for communication between automated vehicle and traffic participants from the viewpoint of human cognitive and behavioral characteristics.

Society & Environment | Society / Infrastructure

BOOTH 16

Meta-heuristic solution for vehicle routing problem

Professor **DAIMON, Tatsuru**
Department of Administration Engineering

Vehicle routing problem (VRP) is a constraint optimization problem on the number of vehicles, link cost (time or distance), load capacity of each vehicle, various requests of customer on time of delivery or pickup (time window). We study fast and conditional algorithm of meta-heuristic solving VRP, with the goal of rationalizing vehicle routing for logistics.

Society & Environment | Industry

BOOTH 17

UX design: Study user's essential desire

Associate Professor **NAKANISHI, Miwa**
Department of Administration Engineering

The UX (User Experience) design not only faithfully responds to the demands that the customer speaks, but also puts in the scope to positively exploit and shape the essential desires and hopes of everyone. We will present examples of recent collaborative researches with some domestic manufacturers.

Society & Environment | Society / Infrastructure

BOOTH 18

Next-generation strategies for Safety Management System: Safety-1 & Safety-2

Associate Professor **NAKANISHI, Miwa**
Department of Administration Engineering

As a safety management strategy to avoid accidents caused by human factors, expectations for the introduction of Safety-2 are increasing in addition to conventional Safety-1. In the safety-critical industries, we introduce the latest research on the management method to carry out both strategies.

Society & Environment | Entertainment

BOOTH 25

Data Analysis: Quantification for Customer Satisfaction and Service Quality, Analysis for Management, Marketing and Sports Data

Professor **SUZUKI, Hideo**
Department of Administration Engineering

Nowadays, in various fields, the use of data analysis attracts attention. In the field of marketing, analysis of data for customer questionnaire survey and the Web environment are conducted. In the medical and sports fields, the use of data analysis is being practiced. We present several data analyses, such as case studies of quantifying customer satisfaction and quality, analysis for management, marketing and sports data.

Society & Environment | Society / Infrastructure

BOOTH 27

Control Theoretic Approach to Super Smart City

Professor **NAMERIKAWA, Toru**
Department of System Design Engineering

The control theoretic and systems and control engineering approaches for the urban infrastructures and energy management systems building toward "super-smart city" will be presented.

Society & Environment | Society / Infrastructure

BOOTH 28

Build quality in process by data

Professor **YAMADA, Shu**
Department of Administration Engineering

The research subject includes the approach to build quality in process by data analysis in order to get high customer satisfaction. The major directions are design of experiments, data analysis customer usage data for design process and total quality management in organization.

Society & Environment | Society / Infrastructure

BOOTH 29

Facilitating Modeling and Enhancing Security of Social Systems

Assistant Professor **IIJIMA, Tadashi**
Department of Administration Engineering

Our research goal is to make social systems work efficiently and safely. To automate and to enhance security level of business processes are important. this laboratory has been researched such technologies. For the former, there are mining, and conformance verification techniques. For the latter, there are security technologies for complex organization structure and IoT sensors.

Society & Environment | Society / Infrastructure

BOOTH 30

Evacuation Planning based on Simulation and Data from IoT Sensors, and Application of Virtual reality techniques to Improve Evacuation Skill

Assistant Professor **IIJIMA, Tadashi**
Department of Administration Engineering

Our research goal is to realize navigation technique for evacuees by real-time planning and notification of an adequate evacuation plan. In order to make the adequate plan, it's necessary to combine various techniques, such as agent-based simulation, physical simulation of disasters, IoT sensor Technology, and virtual reality techniques for visualization.

Biomedical

Biomedical | Medical / Welfare

BOOTH 37

Attachable / Wearable / Implantable Devices: from Healthcare to Advanced Medical Care

Keio Patent

Professor **MIKI, Norihisa**
Department of Mechanical Engineering

Our group is working on innovative healthcare and medical devices that include low salt intake, fatigue monitoring, and artificial organs.

Biomedical | Medical / Welfare

BOOTH 38

Plasmonic biosensing using gold nanoparticles

Professor **SAIKI, Toshiharu**
Department of Electronics and Electrical Engineering

Plasmonic biosensing with high selectivity and stability has been developed by optimizing surface modification of gold nanoparticles. The method is based on dimer formation, where a target molecule is sandwiched between two gold nanoparticles. Selective counting of dimers in water enables reliable quantification of target molecules and also single-molecule Raman spectroscopy offers identification of target molecules.

Biomedical | Medical / Welfare

BOOTH 39

Image analysis for medical and beauty

Short Presentation

Professor **TANAKA, Toshiyuki**
Department of Applied Physics and Physico-informatics

We make the supporting system for the pathological diagnosis and skin texture analysis. The pathological diagnosis system is studied for supporting in the medical front, and the skin texture analysis system is researched for promotion of cosmetics makers. Both themes are developed for the actual use.

Biomedical | Medical / Welfare

BOOTH 40

Wireless health monitoring

Keio Patent

Professor **OTSUKI, Tomoaki**
Research Associate **TOYODA, Kentaro**
Department of Information and Computer Science

Health monitoring is more and more attractive technology to build a more reliable and comfortable society. To realize such society, we develop the technique such as the vital sign monitoring and the fall detection without any wearable devices.

Biomedical | Medical / Welfare

BOOTH 41

Cell Culture System using Ultrasonic Vibration

Keio Patent

Associate Professor **TAKEMURA, Kenjiro**
Department of Mechanical Engineering

Regenerative medicine requires a novel cell culture technology. Our research group aims to develop such cell culture technology using ultrasonic vibration. We will introduce an effective cell collection method using resonance vibration, and enzyme free cell detachment method etc.

Biomedical | Medical / Welfare

BOOTH 42

A Stenotic Artery Therapy: Laser Heating Method

Professor **ARAI, Tsunenori**
Department of Applied Physics and Physico-informatics

We have developed innovative vascular angioplasty by means of laser-mediated-heat generation to treat arteriosclerotic stenotic artery without any vascular injuries. A dilation function as well as drug delivery characteristics were drastically improved. We have performed clinical trials.

Biomedical | Medical / Welfare

BOOTH 43

An Innovative Arrhythmia Therapy: PD ABLATION

Professor **ARAI, Tsunenori**
Department of Applied Physics and Physico-informatics

We have proposed new arrhythmia therapy using the photodynamic therapy for cancer with sophisticated venture incubation and/or coordination of industry-government-university. International heart rhythm societies recognized that our methodology should be one of hopeful technology in the field.

Biomedical | Medical / Welfare

BOOTH 44

Communication Tool for ALS Patient

Keio Patent

Professor **MITSUKURA, Yasue**
Department of System Design Engineering

This research is a communication tool for ALS patients. In fact, we have developed a tool to measure brain waves (EEG) of patients with ALS and to communicate. You will be able to experience the day.

Mechanics

Mechanics | Medical / Welfare

BOOTH 53

Prosthetic hand with haptic technology

Keio Patent

Assistant Professor **NOZAKI, Takahiro**
Department of System Design Engineering

We introduce a prosthetic hand applying state-of-the-art electrical technology. The hand transmits the haptic sense, and it is possible for a wearer to operate without discomfort. Even people who lost their arms can feel the sense through a healthy part of their body. This enables them to grasp complicated shape objects softly.

Mechanics | Industry

BOOTH 54

Ultra-precision machining and intelligent machining system

Keio Patent KIF Research Project

Associate Professor
KAKINUMA, Yasuhiro
Department of System Design Engineering

We research on production process of optical elements, analyzing the sub-surface damage due to nanoscale cutting and grinding of optical materials. In addition, we are working on development of intelligent machine tools which have ability to control machining force and vibration according to cutting state. In our booth, we will exhibit samples of optical elements produced by ultra-precision machining and show the developed intelligent machine tools.

Mechanics | Agriculture, Forestry and Fisheries

BOOTH 55

Smart Agriculture using Multi-function Robot

Short Presentation

Associate Professor **TAKAHASHI, Masaki**
Department of System Design Engineering
Associate Professor **ISHIGAMI, Genya**
Department of Mechanical Engineering

This project develops a multi-function robot system for smart agriculture. This system consists of base module, functional module and interface to satisfy system requirements against physical size, just in time production and low cost.

Mechanics | Industry

BOOTH 56

Laser 3D printing technology for metallic materials

Research Associate **KOIKE, Ryo**
Associate Professor **KAKINUMA, Yasuhiro**
Department of System Design Engineering

Metal 3D printing attracts much attention from various industries because of its applicability to complex-shaped production with high efficiency. This study is now focusing on direct energy deposition, which deposits powder material with a high-power laser, in order to produce a dissimilar-metal joint, a foam metal structure, and construct a time-domain thermal simulation.

Mechanics | Medical / Welfare

BOOTH 67

living and life Support Robot

Associate Professor **NAKAZAWA, Kazuo**
Department of System Design Engineering

We will give a demonstration of a mobile robot for the purpose of the living and life support. Various sensors such as range image sensors are attached on the robot and we can control remotely while judging sensor information. The robot can go to a destination by remote controlling and can avoiding obstacles automatically.

Electronics

Electronics | Medical / Welfare

BOOTH 57

Control System for Welfare Devices

Professor **MURAKAMI, Toshiyuki**
Department of System Design Engineering

Optimal control design of support devices for human motion is considered. This makes it possible to improve the reliability of the support devices. Also it is expected to be extended to the operation skills of human. As one of application examples, avoidance control of falling down motion is shown.

Electronics | Medical / Welfare

BOOTH 58

Diamond Quantum Sensor

Keio Patent Short Presentation

Associate Professor
HAYASE, Junko
Department of Applied Physics and Physico-informatics

Highly-sensitive diamond quantum sensor has been developed for application to detection of nano-devices and bio-materials.

Electronics | Society / Infrastructure

BOOTH 59

Cyber-Physical ICT: Networked Control Systems

Associate Professor **KUBO, Ryogo**
Department of Electronics and Electrical Engineering

In the next-generation IoT (Internet of Things) and M2M (machine-to-machine) networks, low-latency communication and high-precision control technologies are required. We present low-latency, energy-efficient, and secure networked control systems supporting the IoT/M2M infrastructure.

Electronics | Industry

BOOTH 60

Laser direct writing of elastic-functional structures

Keio Patent

Associate Professor **TERAKAWA, Mitsuhiro**
Department of Electronics and Electrical Engineering

Laser fabrication of functional micro- and nanostructures are investigated based on multiphoton additive manufacturing. 1. Direct fabrication of metal microwire surrounded by polymer, 2. Surface modification of polymer to conductive material, 3. Direct processing to form metal structure in hydrogel will be presented.

Electronics | Other Areas

BOOTH 61

Small-size and Low-energy Sensor Systems Detecting Low-molecular Substances for Breath-based Health Monitoring

Professor **UCHIDA, Ken**
Professor **ISHIKURO, Hiroki** Professor **KURODA, Tadahiro**
Department of Electronics and Electrical Engineering

Small-size and low-power sensor systems where nano-materials are utilized will be introduced. The sensors detect gaseous molecules as well as volatile organic compounds (VOC). Because of low-energy properties, it can be integrated in mobile devices such as smart phone and will be utilized to monitor health conditions of users.

Electronics | Society / Infrastructure

BOOTH 62

Spintronics Research Center

Professor **ITOH, Kohei**
Department of Applied Physics and Physico-informatics
Professor **NOZAKI, Yukio** Department of Physics
Associate Professor **ANDO, Kazuya** Department of Applied Physics and Physico-informatics

Spintronics Research Center of Keio University specializes in quantum spintronics research in the framework of the Spintronics Research Network of Japan operated together with U. Tokyo, Tohoku U. and Osaka U. Recent advancements in quantum spintronics research are presented.

Electronics | Industry

BOOTH 63

Responsive Multithreaded Processor for Distributed Real-Time Systems

Keio Patent

Professor **YAMASAKI, Nobuyuki**
Department of Information and Computer Science

We demonstrate some cutting-edge embedded technologies such as Responsive Multithreaded Processor (RMTP) for distributed real-time systems including humanoid robot and spacecraft control, RMTP SoC, RMTP SiP, and Responsive Link that is a real-time communication standard.

Electronics | Society / Infrastructure

BOOTH 64

The application of the negative refractive index distribution type polymer optical fiber and electrogenerated chemiluminescence device

Associate Professor **NIHEI, Eisuke**
Department of Applied Physics and Physico-informatics

We exhibit the amplifier and the branching element using the negative refractive index distribution type polymer optical fiber. And also exhibit the electrogenerated chemiluminescence device made by liquid materials.

Information and Communication

Information and Communication | Society / Infrastructure

BOOTH 65

Thermal Interface for Transmission of Thermal Sensation

Keio Patent

Associate Professor **KATSURA, Seiichiro**
Department of System Design Engineering

"Thermo gloves" are a new interface that can transmit thermal sensation based on thermal-electrical transformation. It is possible to transmit bilaterally since the thermo gloves reproduce not only temperature but also heat inflow.

Information and Communication | Society / Infrastructure

BOOTH 66

M method system

Professor **MATSUOKA, Yoshiyuki**
Assistant Professor **KATO, Takeo**
Department of Mechanical Engineering

The M method system, the new design thinking system, enables the users to conduct two types of thinking, previously very difficult to achieve simultaneously: "unrestricted thinking" and "rational thinking". This system is based on the "Multispace Design Model" that can deal with various designing comprehensively. Its application is not limited to design; it has the potential to be used in many situations–management, planning, research and development, and even everyday life.

Information and Communication | Entertainment

BOOTH 68

Understanding plausible tool use based on human demonstration for intelligent robotic manipulation

Research Associate **AKIZUKI, Shuichi**
Professor **AOKI, Yoshimitsu**
Department of Electronics and Electrical Engineering

For achieving human-like tool use by the robotic arms, our system analyzes the human motion and 6DoF pose of tools. By accumulating tactile histories that occurred on the object surface, the tactile log is generated. The human-like robotic motion can be generated while considering the tactile log.

Information and Communication | Entertainment

BOOTH 69

Action map generation by simultaneous recognition of people and objects

KIF Research Project

Professor **AOKI, Yoshimitsu**
Research Associate **AKIZUKI, Shuichi**
Department of Electronics and Electrical Engineering

We will demonstrate how to detect actions of people who handle everyday goods and generate an Action Map that accumulates the history of actions in the environment. By sharing the Action Map with the robot, it becomes possible for the robot to take actions appropriate to the situations on the spot.

Information and Communication | Entertainment

BOOTH 70

Image sensing technologies for Sports

KIF Research Project

Professor **AOKI, Yoshimitsu**
Department of Electronics and Electrical Engineering

We will introduce examples of research that utilizes image processing and deep learning and supports sports such as rugby, tennis, etc. by video analysis and coaching support.

Information and Communication | Entertainment

BOOTH 71

Proposal of posture estimation target adaptation method using only small learning samples

KIF Research Project

Professor **AOKI, Yoshimitsu**
Department of Electronics and Electrical Engineering

With regard to human pose estimation using a large number of learning samples, it is becoming possible to estimate the pose of a person with high accuracy by using deep learning. In this research we propose a method to realize pose estimation even under conditions with very few estimation target data by utilizing data of different target.

Information and Communication | Entertainment

BOOTH 72

Real time omnidirectional image generation by style conversion using deep learning

KIF Research Project

Professor **AOKI, Yoshimitsu**
Department of Electronics and Electrical Engineering

By using the deep learning style transformation technology, the omnidirectional camera image can be converted in real time. We also demonstrate how to visualize the omnidirectional image on the head mounted display.

Information and Communication | Society / Infrastructure

BOOTH 73

Object region segmentation by deep learning using image labels

KIF Research Project

Professor **AOKI, Yoshimitsu**
Department of Electronics and Electrical Engineering

With semi supervised deep learning using only image labels, accurate object segmentation is realized. We will demonstrate object region segmentation using actual camera image.

Information and Communication | Society / Infrastructure

BOOTH 74

On-line multiple object tracking using re-identification of tracking trajectories

KIF Research Project

Professor **AOKI, Yoshimitsu**
Department of Electronics and Electrical Engineering

We will display a system that detects and tracks multiple persons in real time, utilizing the research results of person re-identification by distance learning using convolution neural networks.

Information and Communication | Industry

BOOTH 75

Quantum computing at IBM Q Network Hub

Associate Professor **YAMAMOTO, Naoki**
Department of Applied Physics and Physico-informatics

Keio University Quantum Computing Center is the only organization in Asia to have access to IBM Q Network. We are working to develop quantum computing software with IBM Q Hub members.

Information and Communication | Other Areas

BOOTH 76

Photonics polymers realiziing super-high-speed and super-high-definition devices

KIF Research Project

Professor **KOIKE, Yasuhiro**
Department of Applied Physics and Physico-informatics

Japan has started the world's first 4K/8K broadcast. We introduce the fastest plastic optical fiber in the world that enables a real-time transmission of the staggering amount of information. Our photonics polymers also bring innovation to the liquid crystal display structure which is getting bigger and more complicated.

Information and Communication | Environment

BOOTH 77

Dynamic Configuration in Energy Efficient Hybrid Data Center Network "HOLST"

Professor **YAMANAKA, Naoaki**
Department of Information and Computer Science

Introduction of optical network is proposed for lowering the power consumption of data center network. In order to effectively use optical resource with low power consumption, we realize dynamically configuration based on the result of predicting flow sizes and classifying them using software defined network.

Information and Communication | Society / Infrastructure

BOOTH 78

Data Center Infrastructure Using Communication Capacity Guaranteed Optical Network Based on Fault Prediction

Professor **YAMANAKA, Naoaki**
Department of Information and Computer Science

Traffic load is rapidly increasing year by year and introduction of optical networks is being studied with the aim of saving power consumption in data center networks. Therefore, the impact caused by the failure will increase. In this research, we will realize a data center optical network which guarantees the communication capacity based on failure prediction.

Information and Communication | Society / Infrastructure

BOOTH 79

Network-assisted autonomous driving platform

Professor **YAMANAKA, Naoaki**
Department of Information and Computer Science

There are many researches for practical realization due to the development of autonomous driving technology. In our proposed autonomous driving platform, by executing part of the autonomous driving function on the network, it enables efficient information processing and provides more advanced autonomous driving control.

Information and Communication | Society / Infrastructure

BOOTH 80

Network resource pooling technology with Reconfigurable Communication Processor

Professor **YAMANAKA, Naoaki**
Department of Information and Computer Science

As a reconfigurable resource on the network, by using Reconfigurable Communication Processor (RCP) composed of hardware resources such as FPGA/LSI/CPU, we provide services to user's requests. In this work, by connecting RCPs to each other with photonic network to make it as resource pool, we realize a flexible, scalable and high-speed network.

Information and Communication | Industry

BOOTH 81

Polymer Optical Waveguide Devices Enabling High-Performance Computing

Keio Patent

Associate Professor **ISHIGURE, Takaaki**
Department of Applied Physics and Physico-informatics

For realizing Exa-Flops scale high-performance computers,"On-board optical interconnect technologies" toward the inter-chip optical wiring have drawn much attentions. In our research, polymer optical waveguide devices are designed and then, fabricated for enabling high-bandwidth-density optical wiring, and their capabilities in Exa-Flops scale computing are demonstrated.

Information and Communication | Other Areas

BOOTH 82

Smart Community Implementation

KIF Research Project

Professor **NISHI, Hiroaki**
Department of System Design Engineering

Research activity and local implementation of smart community are introduced by illustrating the Smart Town project cooperated with a local government. In this project, common data platform for handling local information was designed. It provides safe and flexible local community services by integrating and managing data sharing, data publishing, and data anonymization.

Information and Communication | Other Areas

BOOTH 83

Exploration of New Mathematical Methods in Artificial Intelligence and Machine Learning

Short Presentation

Professor **BANNAI, Kenichi**
Department of Mathematics

There has been great advancement in the field of artificial intelligence and machine learning each time new theory such as statistics and optimization was introduced. The purpose of this research, which includes joint research with RIKEN AIP and Fujitsu is an attempt to introduce new pure mathematical methods to the field of Machine Learning.

Information and Communication | Industry

BOOTH 84

Reading in Mind - Quantifying Taste,"feelings" in mind

Keio Patent

Professor **MITSUKURA, Yasue**
Department of System Design Engineering

In this research, we introduce a method of quantifying preference using EEG, a thought thought in mind, and a method to quantify feelings that were not quantified.

Information and Communication | Other Areas

BOOTH 85

Borderless utilization of data

Keio Patent

Assistant Professor **KANEKO, Kunitake**
Department of Information and Computer Science

Digital data continues to increase. Although digital information is easy to distribute, secondary use is not proceeding. We will introduce the content network and its supporting technologies to promote utilization beyond existing borders such as industries and applications.

Information and Communication | Society / Infrastructure

BOOTH 86

RTA (Remote Table Access): a Table-form Publication Architecture for Open Data

Associate Professor **TOYAMA, Motomichi**
Department of Information and Computer Science

We propose a new architecture for open data distribution called RTA (Remote Table Access), which is based on table of SQL. In many cases, the open data by local governments are in CSV, which hampers continual integrated usage of open data. We would like to demonstrate higher usability of RTA at the booth.

Information and Communication | Society / Infrastructure

BOOTH 87

Declarative Data Visualization by SuperSQL

Associate Professor **TOYAMA, Motomichi**
Department of Information and Computer Science

We have applied the technology of SuperSQL to data visualization. SuperSQL is an extension of SQL added with data structuring and publication capabilities. The high-level structuring power of SuperSQL allows complex specification of 2D, 3D data visualization in a declarative manner. We will demonstrate the 3D visualization into Unity VR.

Information and Communication | Society / Infrastructure

BOOTH 88

Interactive Intelligent Systems

Professor **IMAI, Michita**
Department of Information and Computer Science

We are studying interactive intelligence to realize a fluent interaction between humans and machines. We design systems that plans actions interactively by incorporating the cognitive traits and machine learning. Today, we are presenting interactive robots and systems and explain our thoughts behind them.

Information and Communication | Society / Infrastructure

BOOTH 89

IoT system with self-reliant wind power supply and Wi-Fi multi-hop communication that enables transmission of still images

Professor **TERAOKA, Fumio**
Department of Information and Computer Science

Existing IoT systems collects only sensor data (a few bytes) using low power wide area communication technology (coverage: a few km, speed: a few tens kbps). This research aims at developing an IoT system that enables to collect image data (a few Mbytes) using self-reliant wind power supply and Wi-Fi multi-hop communication technology in a wide field.

Information and Communication | Society / Infrastructure

BOOTH 90

LiON: Automatic Construction Mechanism for Experimental Virtual Network Considering Network Topology

Professor **TERAOKA, Fumio**
Department of Information and Computer Science

In the existing tools for experimental network construction, there was only a way of describing settings deviating from user requirements. LiON realizes Infrastructure as Code (IaC) which enables users to describe the infrastructure environment in a way that users can easily understand, and can intuitively construct experiment networks intuitively from the network topology using JSON file.

Information and Communication | Society / Infrastructure

BOOTH 91

Reduction of Load by Edge Computing and Privacy Preserving Data Collection for Vehicles

Professor **SHIGENO, Hiroshi**
Department of Information and Computer Science

We are conducting research to realize dynamic adaptive computing by edge computing. In addition, we are applying edge computing to vehicles, and we are conducting research on collection methods considering privacy through anonymization of traveling information and vehicle type information.

Information and Communication | Medical / Welfare

BOOTH 92

Interactive Systems that Induce Helth Enhancement Actions

Keio Patent

Assistant Professor **SUGIURA, Yuta**
Department of Information and Computer Science

We introduce interactive systems that induce health enhancement actions. Our final goal is an extension of “healthy life expectancy”.

Information and Communication | Medical / Welfare

BOOTH 93

Computational Ophthalmology

Professor **FUJISHIRO, Issei**
Department of Information and Computer Science

A collaborative research project, called Computational Ophthalmology, with University of Yamanashi attempts to take full advantage of augmented reality technologies to adaptively assist the patients with visual impairments, including achromatopsia, visual field disturbance, metamorphopsia, and binocular diplopia. In this booth, we present our basic approaches to ameliorating these kinds of visual impairments and their latest results.

Information and Communication | Society / Infrastructure

BOOTH 94

Analysis on Bitcoin Transaction

Research Associate **TOYODA, Kentaro**
Professor **OTSUKI, Tomoaki**
Department of Information and Computer Science

Bitcoin is used for many things: Gambling, donation, marketplace, and even investment scam. We show our latest result by analyzing the transaction data in the Bitcoin blockchain and data obtained from the Internet.

Other Fields

Other Fields | Industry

BOOTH 51

Applied Abstraction and Integrated Design

Keio Patent

Associate Professor **KATSURA, Seiichiro**
Department of System Design Engineering

The target of “applied abstraction” is to reveal solutions that build a bridge between infinite-analysis of science and synthesis of engineering by integrated system design, aiming for creating simple and strong ideas toward construction of future human-support systems and robots.

Other Fields | Industry

BOOTH 52

Data Robotics

Associate Professor **KATSURA, Seiichiro**
Department of System Design Engineering

This technology is integration of database and control for attainment of robot’s flexible motion. It is possible to extend robots’ functions such as skill transfer and complicated task execution, etc.

Group Exhibition Zone: Chemistry and Biology

Our lives are closely related to biomolecules, which not only make up our bodies, but also act as bioactive substances, some of which may be environmentally harmful, that are related to health, beauty and disease. This year's group exhibition on chemistry and biology focuses on the themes of "substances" and "life", and offers new insights into these topics to visitors. It involves 16 booths run by 15 members from the Department of Applied Chemistry, Department of Chemistry, and Department of Biosciences and Informatics. We will address a wide range of needs and interests!

Short Presentation

Short Presentation

Time / 12:50-13:20 Venue / Short Presentations ①

* Refer to the Floor Map on page 02 and 03 to find the venue.

Biomedical | Medical / Welfare

BOOTH 1

Analysis of glycan processing and elucidation of action mechanism of bioactive compounds: for development of disease therapeutic drugs

Research Associate **MIURA, Kazuki**
Professor **SIMIZU, Siro**
Department of Applied Chemistry

In post-translational modifications of protein, glycosylation is closely related to various diseases. We are researching on relationship between glycosylation and disease using human cells and elucidation of action mechanism about biological activity natural compounds. In future, we think that these results can apply to various fields such as medicine.

Biomedical | Medical / Welfare

BOOTH 2

Development and application of novel technology for the efficient synthesis of highly-functional glycosides

Keio Patent

Associate Professor **TAKAHASHI, Daisuke**
Professor **TOSHIMA, Kazunobu**
Department of Applied Chemistry

Various glycosides have been widely used as drugs, functional foods, surfactants, and cosmetic materials in our daily life. Therefore, creation of novel and highly-functional glycosides is attracted much attention. In this context, we focus on development of novel and efficient glycosylation technologies and creation of highly-functional glycosides.

Society & Environment | Society / Infrastructure

BOOTH 3

Development of new air purification technologies to facilitate "subways with the world's cleanest air"

Associate Professor **OKUDA, Tomoaki**
Department of Applied Chemistry

The subway system is an enclosed space and the attendant concerns about contaminated air, no systematic investigations on the air quality in subways have been carried out. This collaborative project aims to develop new technologies that will remove dust generated by subway by combining a know-how on electrostatic charging of brake dust with the filtration technologies.

Biomedical | Environment

BOOTH 4

CYCLEX project: New development of high-volume cyclone sampler for evaluating adverse health effect caused by air particulate matter

Associate Professor **OKUDA, Tomoaki**
Department of Applied Chemistry

Recently, atmospheric aerosols such as PM2.5 are of serious concern for human health. Physical and chemical properties of aerosols are important as they provide metrics for their adverse health effects. Here I would like to introduce recent concept to elucidate these parameters using aerosol engineering techniques such as virtual impactor and cyclone system.

Biomedical | Medical / Welfare

BOOTH 19

Chemical Sensors and Biosensors for Healthcare and Environmental Applications

Keio Patent

Professor **CITTERIO, Daniel**
Assistant Professor **HIRUTA, Yuki**
Department of Applied Chemistry

Our laboratory works on the development of sensitive chemical sensors and biosensors for environmental and healthcare applications. Research topics include the development of functional fluorescent dyes, luminescent probes and functional nanomaterials for sensing applications. In addition, we make use of paper substrates to realize low-cost and simple (bio) chemical sensing devices.

Materials | Industry

BOOTH 20

Preparation of organic crystal exhibiting emission and mechanical motion

Research Associate **MIURA, Youhei**
Department of Applied Chemistry

It was found that azaacene derivatives was prepared and it show aggregation induced emission that show fluorescence in aggregation state but not in solution. It was also found that crystal of the compound exhibit thermosalient effect that is crystal jumping by heating.

Materials | Other Areas

BOOTH 21

Control of Droplets for Continuous Processes

Assistant Professor **FUJIOKA, Satoko**
Department of Applied Chemistry

We have developed a novel static mixer which can make emulsions continuously. Because of its low energy consumption, no generation of heat and low risk of contamination, application for food industry is expected. We also investigate utilization of droplets as reaction fields for continuous production of fine particles.

Materials | Environment

BOOTH 22

Cell-sized droplet-type robots exhibiting stimuli-responsibilities

Assistant Professor **BANNO, Taisuke**
Department of Applied Chemistry

Cell-sized self-assemblies composed of the designed and synthesized amphiphiles exhibit morphological changes and transition to other assemblies in response to external stimuli such as the temperature change and the addition of metal ions. These assemblies have potential applications as probes for exploring and collection of compounds in very small spaces.

Materials | Industry

BOOTH 23

Spontaneous generation of dynamisms in chemical systems and cosmetic technologies

Keio Patent

Professor **ASAKURA, Kouichi**
Department of Applied Chemistry

One characteristic feature of living system is the spontaneous generation of dynamism. Artificial chemical systems, however, also can generate similar dynamism when they are in far-from-equilibrium conditions. Since cosmetics are frequently exposed to far-from-equilibrium conditions when they are used, controlling the dynamism generating in cosmetics might be an important technology.

Materials | Other Areas

BOOTH 24

Photoresponsive Nano-Magnets

Assistant Professor **YAMAMOTO, Takashi**
Professor **EINAGA, Yasuaki**
Department of Chemistry

A key issue in molecular electronics is the control of electronic states by optical stimuli. In this research, we would like to introduce photoresponsive nano-magnets such as nanoparticles and nanosheets.

Materials | Environment

BOOTH 31

Novel Organic-Inorganic Hybrid Materials for Solar Energy Conversion and Optoelectronics

Associate Professor **HASOBE, Taku**
Assistant Professor **SAKAI, Hayato**
Department of Chemistry

In this presentation, we'd like to introduce our recent research results: organic-inorganic hybrid materials for solar energy conversion and optoelectronics.

Biomedical | Medical / Welfare

BOOTH 32

Discovery of the drug lead compounds from marine organisms

Research Associate **IWASAKI, Arihiro**
Professor **SUENAGA, Kiyotake**
Department of Chemistry

Some compounds produced by organisms exhibit useful biological activities, and their structures have been regarded as good motifs for the drug development. In order to discover novel drug lead compounds, we have investigated the secondary metabolites of marine organisms such as marine cyanobacteria.

Biomedical | Environment

BOOTH 33

Study in Nature! -Water bear and Planarian-

Associate Professor **MATSUMOTO, Midori**
Department of Biosciences and Informatics

We coexist with small organisms on the earth, which have amazing life force not found in humans. We are studying water bear that can survive in extreme conditions and planarian that can be regenerated even when cutting. Here, I would like to introduce their wonderful skill.

Biomedical | Medical / Welfare

BOOTH 34

Application of the designed protein nano-cage

Keio Patent

Assistant Professor **KAWAKAMI, Norifumi**
Department of Biosciences and Informatics

We have recently produced 22 nm protein nano-cage that can incorporate small molecules, such as drug and pigment molecules, advantageous for the drug delivery system and the selective labeling of cells and molecules.

Biomedical | Medical / Welfare

BOOTH 35

Developmental Mechanism of Central Pattern Generator

Assistant Professor **HOTTA, Kohji**
Department of Biosciences and Informatics

I am now studying the developmental mechanism of central pattern generator which regulate locomotion.

Biomedical | Medical / Welfare

BOOTH 36

Biomaterials built from polymer materials

Professor **FUJIMOTO, Keiji**
Assistant Professor **FUKUI, Yuuka**
Department of Applied Chemistry

We focus on the design and synthesis of polymer materials (atto-reactor for nanocrystals and nano-fibers, core-shell particle for nano-imprinting), soft matters (liposome, gel particle) and bio-macromolecules (nanoparticle) possessing novel functionalities. Our research includes development of biomedical tools (nano-manipulating tool, nanocapsule) and techniques (cell-surface modification, particle scaffold for cell sheet) for drug delivery and tissue engineering.

Medical-Engineering Collaboration Zone

Keio University has a history of conducting collaborative research between the School of Medicine and the Faculty of Science and Technology. This research has lately expanded beyond the medical field to encompass robotics, cognitive science, and even big data. The exhibit will highlight leading technologies being developed by this medical-engineering collaboration at Keio University.

Short Presentation

Short Presentation

Time / 14:45-15:45 Venue / Short Presentations ①

* Refer to the Floor Map on page 02 and 03 to find the venue.

Medical-Engineering Collaboration Zone

BOOTH 45

The world's first! Sleep Stage Extraction Algorithm using only Heart Rate

Professor **YASUI, Masato**
Department of Pharmacology, Keio University School of Medicine
Associate Professor **FUKUNAGA, Koichi**
Department of Pulmonary Medicine, Keio University School of Medicine
Professor **MITSUKURA, Yasue**
Department of System Design Engineering

In this research, we introduce the world's first device which can accurately determine 5 stages of REM, NonREM 1, 2, 3, Awake simply by measuring heart rate.

Medical-Engineering Collaboration Zone

BOOTH 46

Project for Objective Measures by Collaborating Medical and Technology

Assistant Professor **KISHIMOTO, Taishiro**
Department of Neuropsychiatry, Keio University School of Medicine
Professor **MITSUKURA, Yasue**
Department of System Design Engineering

Mental health issue is glowingly important in many countries. However, due to the lack of biomarkers that closely reflect illness severity, psychiatry field suffers enormously in diagnosing, assessing treatment response, and developing new drugs. We are developing new assessment tools to quantify the severity of psychiatric symptoms utilizing information technology and machine targeting patients' voice, facial expression, body movement, language, heart rate variability, electro encephalogram, language, daily activity, sleep, etc.

Medical-Engineering Collaboration Zone

BOOTH 47

Integrated development of probes and microscope for bioimaging

Associate Professor **NURIYA, Mutsuo**
Department of Pharmacology, Keio University School of Medicine
Professor **FUJIMOTO, Yukari**
Department of Chemistry

The first step in characterizing the action of drugs and bioactive molecules is to visualize them. In general, however, such visualizations are difficult because these molecules are not visible and tissues are not transparent. Here, we will introduce a new approach to overcome these difficulties by integrated development of probes and microscope.

Medical-Engineering Collaboration Zone

BOOTH 48

Multifunctional Gene Delivery System For rAAV-mediated Gene Transfer Using Hydrogel Microparticles

Assistant Professor **FUJIOKA, Masato**
Department of Otorhinolaryngology, Keio University School of Medicine
Associate Professor **ONOE, Hiroaki**
Department of Mechanical Engineering

Over 500 million people in the world are annoyed with hearing loss and biomedical scientists have been developing gene therapies for the deafness. We are trying to generate new methods efficiently introduce genes into the inner ear to support those therapeutics by utilizing multifunctional hydrogel-based microparticles.

Medical-Engineering Collaboration Zone

BOOTH 49

Glycomics for diagnosis and drug discovery in metastatic prostate cancer

Professor **OYA, Mototsugu**
Department of Urology, Keio University School of Medicine
Professor **SATO, Toshinori**
Department of Biosciences and Informatics


The number of patients with prostate cancer is increasing rapidly, and the mortality rate in male cancer will be ranked first in the near future. Although organ confined prostate cancer has become curable, treatment outcome for metastatic prostate cancer is limited. In this study, in order to deepen the understanding of drug resistance, we are conducting glycomics of drug resistant prostate cancer cells.

Medical-Engineering Collaboration Zone

BOOTH 50

Surface-engineered substrate for large-scale human iPS cell culture

Professor **FUKUDA, Keiichi**
Department of Cardiology, Keio University School of Medicine
Associate Professor **MIYATA, Shogo**
Department of Mechanical Engineering


Large scale culture of human induced pluripotent stem cells (hiPSCs) is an essential technique for clinical application. We will introduce the surface modifying technology to succeed in reducing matrix coating and providing optimal culture condition for hiPSCs.

〔Special Exhibits〕

A

Central Service Facilities for Research

B

Yokohama Industrial Development Corporation (IDEC)

C

Kawasaki Institute of Industry Promotion (KIIP)

〔Panel Presentations〕

Society & Environment | Environment

PANEL 95 Erosion-free ultrasonic cleaning with fine bubbles

KIF Research Project

Assistant Professor **ANDO, Keita**
Department of Mechanical Engineering

In industry, underwater ultrasound is used to clean solid surfaces but may give rise to surface damage due to cavitation bubble collapse. Here, we propose an efficient and erosion-free cleaning method based on mild bubble dynamics by low-intensity ultrasound.

Information and Communication | Society / Infrastructure

PANEL 96 PRINTEPS: An Integrated Intelligent Application Development Platform

Short Presentation
KIF Research Project

Professor **YAMAGUCHI, Takahira**
Assistant Professor **MORITA, Takeshi**
Department of Administration Engineering

System development using general-purpose robots takes a lot of time. If the intelligent software is incorporated, cost (human, monetary, time) will be even higher. Therefore, in order to facilitate the development of the intelligent system using a robot, we perform research and development for building tools and intellectual software.

Materials | Society / Infrastructure

PANEL 97 Nondestructive inspection technology of polymeric materials by terahertz light source

Keio Patent
KIF Research Project

Associate Professor **WATANABE, Shinichi**
Assistant Professor **OKANO, Makoto**
Department of Physics

In this panel, we will explain the non-destructive inspection technology of polymeric materials using the terahertz light source. We can inspect the internal strain of black rubber and the orientation of carbon filler, and our technology attracts much attention, especially in the rubber and tire industry.

Biomedical | Medical / Welfare

PANEL 98 The development of microthermofluidic devices for life science research

Keio Patent

Associate Professor **TAGUCHI, Yoshihiro**
Associate Professor **SUDO, Ryo**
Department of System Design Engineering

This project develops microthermofluidic devices for life science research by the integration of microfluidic devices, which have been developed from the standpoint of bioengineering and bioMEMS, and micro-optical detection systems, which have been developed from the standpoint of thermal engineering and optical MEMS.

Information and Communication | Society / Infrastructure

PANEL 99 Safe web interface and high-efficient data delivery in IoT

Professor **SASASE, Iwao**
Department of Information and Computer Science

In IoT, generality, the power-saving and security & privacy are desired. We consider Power-saving in IoT, a multi-purposed data delivery system and the web interface which satisfies high security and privacy.

Information and Communication | Medical / Welfare

PANEL 100 Construction of a question-answering AI system that automatically answers the Medical Licensing Examination

Keio Patent

Professor **SAKAKIBARA, Yasubumi**
Department of Biosciences and Informatics

We have developed a question-answering system that automatically answers the Medical Licensing Examination of Japan. Using the system as a model, our final goal is to develop an artificial intelligence system that would try to make medical diagnoses according to the contents recorded in the Electronic Health Record.

Electronics | Industry

PANEL 101 Compact optical frequency comb light source

Professor **TANABE, Takasumi**
Department of Electronics and Electrical Engineering

We are developing small optical frequency-comb source. Optical frequency-comb is a light having comb-like spectrum of which component are aligned equidistance frequency separation. The output is a pulse train in optical domain. The repetition rate of this portable source is higher than 100 GHz, and it may be used for high precision methodology and high-speed optical communication.

KEIO TECHNO-MALL 2018 Event Schedule

Event Stage

9:30

9:55 **Opening Address**

10:00

10:15-10:20 **Opening Ceremony**

10:30

11:00

11:15-12:45

Round-table Session I

Using AI that goes beyond play:
Can AI really achieve results?

11:30

12:00

12:30

13:00

13:30

13:30-14:30

Main Event / Special Interview

Expectations for Keio-originated technology:
Toward dreams

14:00

14:30

15:00

15:00-16:30

Round-table Session II

Future technologies are just around the corner!

15:30

16:00

16:30

Short Presentations ①

10:15-10:20 **Live broadcast of the Opening Ceremony**

10:30-10:45 **Live broadcast of the Interviews ①**

10:45-11:00 **Live broadcast of the Interviews ②**

11:15-12:45

Live broadcast of the Round-table Session I

12:50-13:20

Short Presentation

Group Exhibition Zone: Chemistry and Biology

13:30-14:30

Live broadcast of the Main Event

14:45-15:45

Short Presentation

Medical-Engineering Collaboration Zone

16:00-16:20 **TAKAHASHI, Masaki**
Dept. of System Design Engineering
Smart Agriculture using Multi-function Robot

16:35-16:55 **YAMAGUCHI, Takahira**
Dept. of Administration Engineering
PRINTEPS: An Integrated Intelligent Application Development Platform

Short Presentations ②

11:10-11:30 **ONOE, Hiroaki**
Dept. of Mechanical Engineering
Biomedical and information devices Integrated with micro/nano-scale functional materials

11:45-12:05 **TANAKA, Toshiyuki**
Dept. of Applied Physics and Physico-informatics
Diagnosis supporting by image analysis and artificial intelligence in medical and cosmetic fields

12:20-12:40 **BANNAI, Kenichi**
Dept. of Mathematics
Pure Mathematics and Machine Learning

14:40-15:00 **HAYASE, Junko**
Dept. of Applied Physics and Physico-informatics
Diamond Quantum Sensor

15:00-16:30

Live broadcast of the Round-table Session II

* Please note that content, etc. of events are subject to change due to unavoidable circumstances on the day of the exhibit.

* For Event Information, please refer to the pages 06-07.