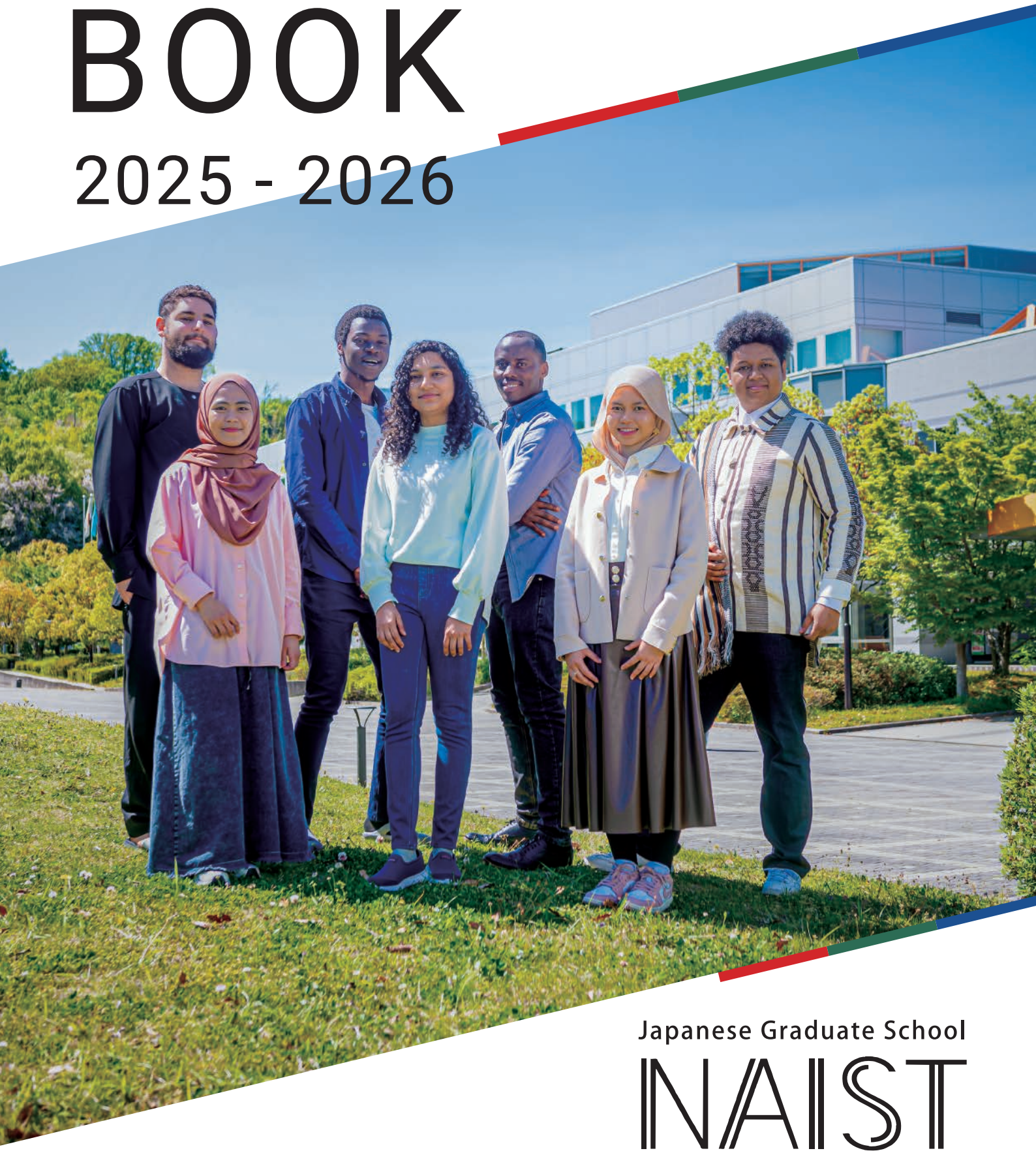
GUIDE BOOK

2025 - 2026



Japanese Graduate School

NAIST

Nara Institute of Science and Technology

About NAIST

Nara Institute of Science and Technology (NAIST) was founded as a unique Japanese national university consisting solely of graduate schools in the three areas of information science, biological sciences, and materials science to redefine graduate-level education. In 2018, to push forward the boundaries of advanced science and technology, the three graduate schools merged to create the Graduate School of Science and Technology with Education Programs in the original three research areas and two of their interdisciplinary areas. At present, over 1,200 students —roughly 25% from overseas— are supervised by approximately 200 NAIST faculty.

With its cutting-edge facilities and a high student-to-faculty ratio, NAIST's world-leading research and education are a direct result of its rich, global environment and supportive infrastructure. Moreover, NAIST's faculty and students' outstanding achievements are shared world-wide through patents, licenses, spin-off companies, and active international exchange. As a result, NAIST has quickly established itself as a world-class research and education center where young research scientists and engineers become tomorrow's global leaders.

From its establishment, NAIST has developed education programs and research that begin with NAIST and spread across research fields through our extensive global network of NAIST graduates and international partner institutions. This network is not only key to our research activities, which are undertaken spanning the globe to promote collaboration at the forefronts of science and technology, but a central part of NAIST's global education programming, allowing students to experience today's international trends and environments.

NAIST eagerly promotes admission of students from both Japan and overseas who have strong basic academic capabilities, regardless of their academic backgrounds, and actively admits researchers, engineers and others currently working in society with strong enthusiasm for advanced scientific research and clearly defined aspirations for the future.

President's Vision 2030

NAIST celebrated its 30th anniversary in 2021 and the President, Dr. Kazuhiro Shiozaki, issued his vision of what NAIST should be in 2030. Upon the foundation laid by its prominent achievements over the past three decades, NAIST will build a campus community that strives for the new development in research and education through "co-creation" with diverse stakeholders. Please use the QR code to view the President's Vision 2030 and find out how NAIST will pursue co-creation to fulfill its mission as a national postgraduate institution.

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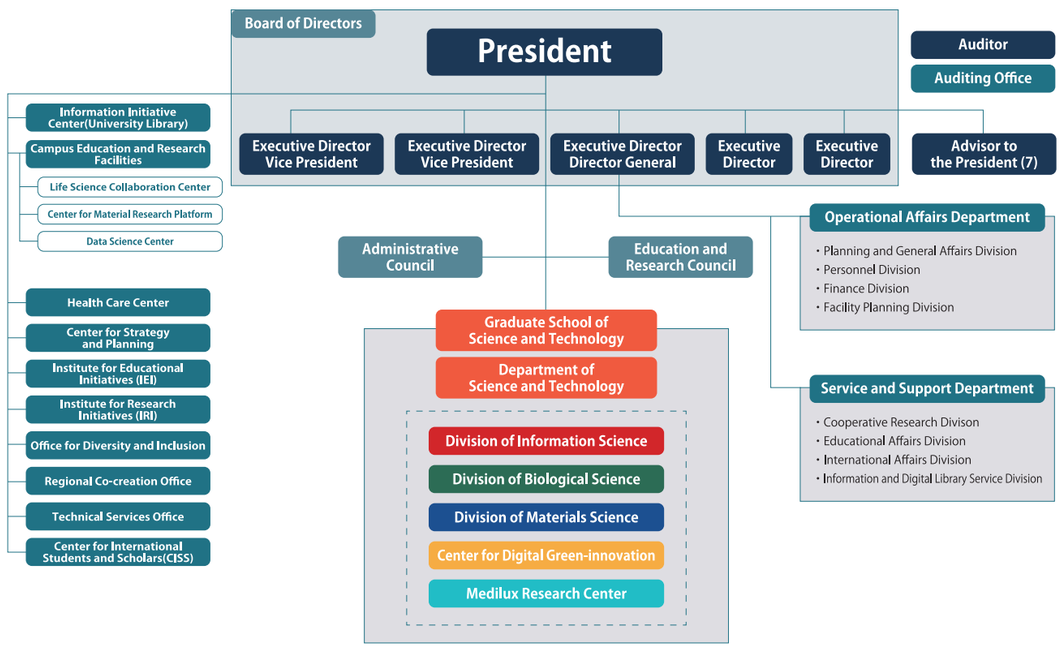
Organization

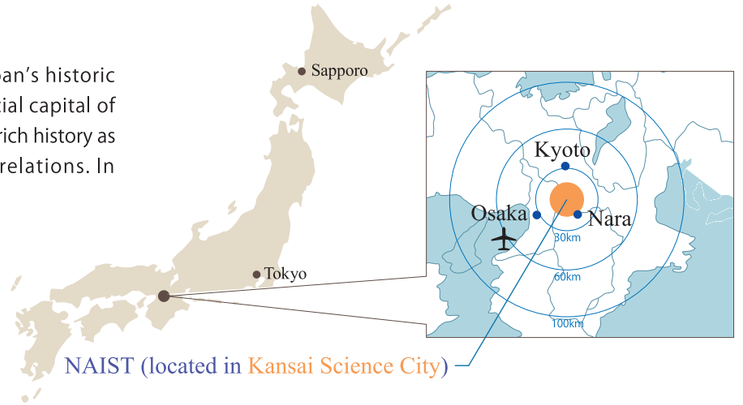


NAIST Timeline

1991	NAIST established on October 1st (Graduate School of Information Science)
1992	Graduate School of Biological Sciences established
1996	Graduate School of Materials Science established
2004	NAIST became a National University Corporation, Industry-Government-Academia Collaboration Group established
2010	Information Initiative Center and Research Center for Advanced Science and Technology established
2017	Data Science Center established
2018	Three original graduate schools merged to create Graduate School of Science and Technology
2021	Center for Digital Green-innovation established
2023	Life Science Collaboration Center and Center for Material Research Platform established
2024	Medilux Research Center established

Location

NAIST is located in Ikoma City, in Japan's historic Nara Prefecture. Home of the first official capital of Japan, Nara Prefecture has an incredibly rich history as a center for international trade and relations. In addition to its prolific ancient heritage, Nara Prefecture is also conveniently located in close proximity to Kyoto and Osaka, and just 60 minutes from Kansai International Airport.



NAIST Numbers

NAIST is an institute focused solely on graduate school education based on its research achievements in the leading fields of science and technology

NAIST Student Enrollment

Master's	Doctoral	Research students, etc.
778	425	79
Total: 1282 (International students: 26%)		

(As of May 2025)

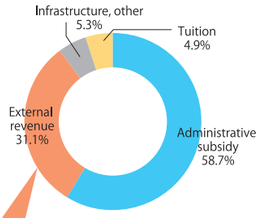
NAIST Faculty and Staff

Executive administration	Faculty	Staff
8	203	158
Total: 369 (International faculty and staff: 9%)		

(As of May 2025)

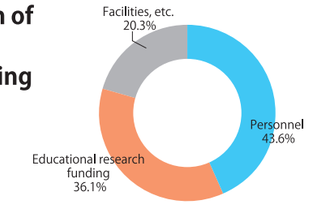
High Percentage of External Revenue

FY2024 Revenue:
Total 10.3 billion (JPY)

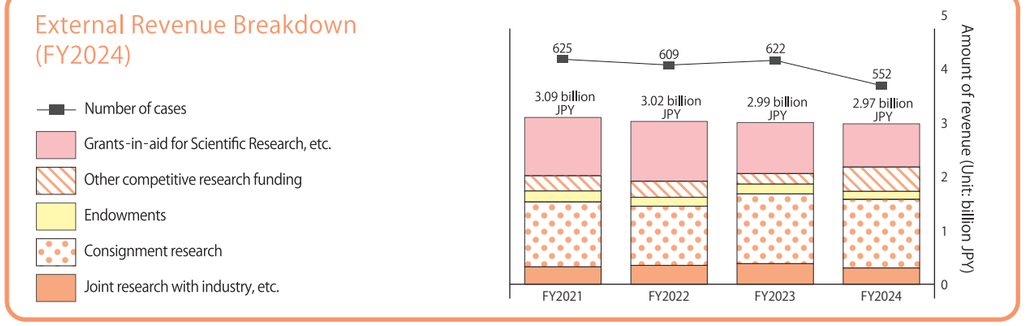


High Allocation of Educational Research Funding

FY2024 Expenses:
Total 9.3 billion (JPY)



External Revenue Breakdown (FY2024)



Study at NAIST

Entrance Examination Page

General Schedule of Entrance Examination

Course (Admission Capacity)	Enrollment		Pre-Application	Application	Examination
	Fall (October)	Spring (April)			
Master's Course (390)	2nd Exam	1st Exam	February - April	June	July
	—	2nd Exam	May - July	September-October	October
	1st Exam	3rd Exam	October - December	February	March
Doctoral Course (112)	2nd Exam	1st Exam	until June	July	August
	1st Exam	2nd Exam	until December	January	February

*The schedule may be changed depending on each year.

NAIST Highlights

J-PEAKS
(Program for Forming Japan's Peak Research Universities)

NAIST has been selected for the "J-PEAKS" program (FY2025-2029, 5.5 billion yen in total), launched by the Ministry of Education, Culture, Sports, Science and Technology, Japan.

Under J-PEAKS, NAIST promotes the vision of becoming "A graduate school university that contributes to the sustainable development of a society with a declining population through the promotion of social implementation of research seeds using digital technology and international collaboration."

Our goal is to drive social transformation in response to the declining working-age population by developing PhD-level talent and advancing automation technologies. We strategically recruit researchers from Southeast Asia and support their growth through international education. Furthermore, we encourage sustainable innovation by promoting research driven by AI and informatics, as well as fostering collaboration with industry, all facilitated by an autonomous implementation system.

The Advanced Information Specialist Course

This course introduces new educational content and promotes industry-academia collaboration to enhance our existing cutting-edge education and research. In addition, the number of admission capacity in the Master's Course and the Doctoral Course will be increased.

Educational goals

- Develop human resources who can use advanced information technology to solve society's problems.
- Provide comprehensive information science education that combines theory and practice.
- Develop professionals with practical skills in collaboration with industry.

Admission Capacity

	Until FY2024		From FY2025
Master's Course	350	➡	390
Doctoral Course	107	➡	112

NAIST Granite Program
(Support for Pioneering Research Initiated by the Next Generation)

At NAIST, the "Support Project for Innovative Doctoral Students in the Field of Multidisciplinary Research in Advanced Science and Technology Ver.2 (NAIST Granite Program)" has been launched, with the Executive Directors of Education serving as the project director. The program selects outstanding doctoral students and provides them with financial support, research funding, and various initiatives designed to help develop their career paths.

MSTeC NARA
(General Incorporated Association Medical Science and Technology Collaboration NARA)

Corporate structure established in cooperation between NAIST and Nara Medical University which aims to promote close collaboration in the fields of medicine, engineering, and related sciences. Its objectives are to enhance the quality of education and research, strengthen university functions, foster innovation in next-generation medicine and medical-engineering collaboration, and contribute to regional development and advancements in medical technology.

Globalization at NAIST

We provide the coordinated education and conduct research activities necessary to produce researchers and engineers who push forward the boundaries of science and technology and are active participants in today's global society, and the extensive organized support to ensure their success.

NAIST's Global Campus

At NAIST, in order to develop global leaders in science and technology, we have focused on the globalization of our campus, including academic environments and campus facilities, while also restructuring our education programming to respond to current global needs and trends in science and technology. These efforts have produced a truly unique on-campus community that is central to students' and researchers' experience at NAIST. With students from various cultures, fields and backgrounds studying and performing research under NAIST's diverse faculty, our campus has become an international hub for both education and research in science and technology and we are maintaining and actively expanding our network of domestic and international partners to further promote our activities globally.

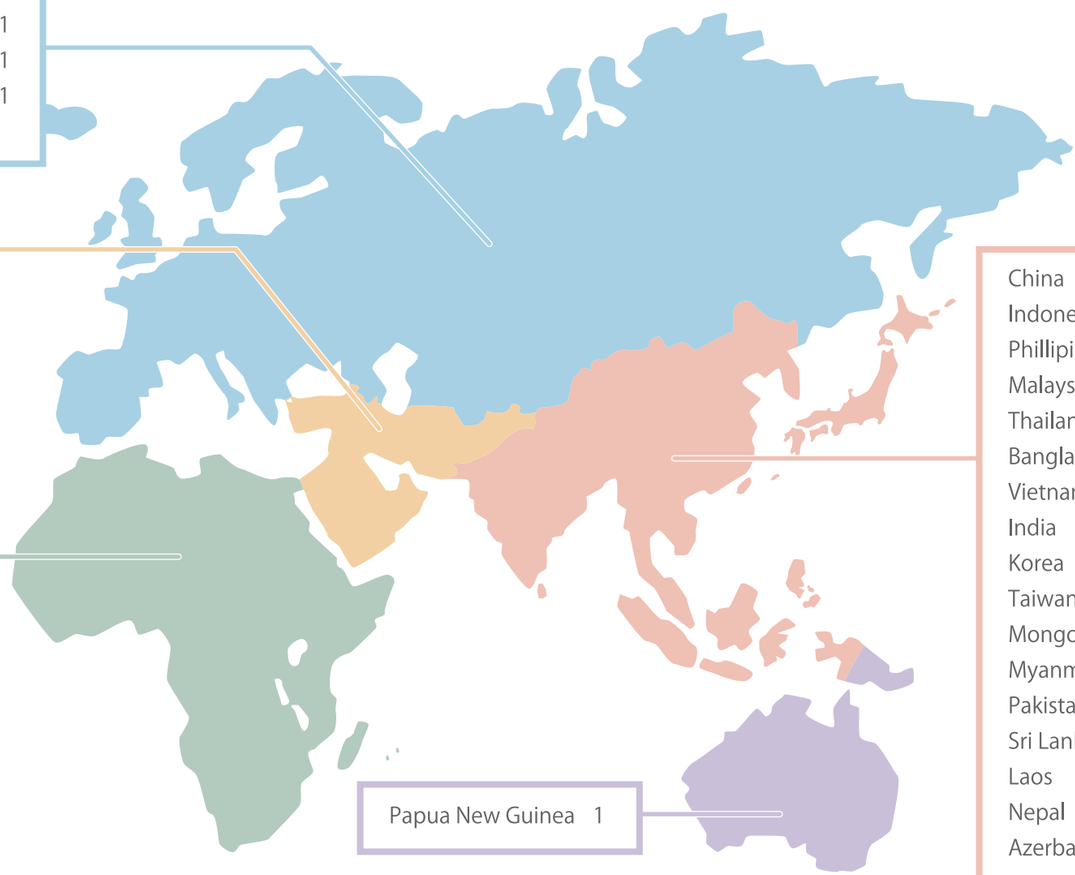
International Student Enrollment

(As of April 2025)

France	10	Czech Republic	1
Germany	7	Italy	1
Russia	2	Spain	1
Armenia	1	Poland	1
Belgium	1		

Iran	3
Lebanon	1
Syria	1

Côte d'Ivoire	3
Nigeria	3
Tanzania	3
Burkina-Faso	1
Ethiopia	1
Madagascar	1
Morocco	1
Sudan	1
Tunisia	1
Uganda	1
Kenya	1
Rwanda	1



Papua New Guinea	1

China	96
Indonesia	59
Phillipines	29
Malaysia	21
Thailand	20
Bangladesh	12
Vietnam	11
India	4
Korea	4
Taiwan	7
Mongolia	2
Myanmar	2
Pakistan	2
Sri Lanka	2
Laos	1
Nepal	1
Azerbaijan	1

Mexico	4
Canada	1
USA	1

Brazil	1
Colombia	1
Haiti	1
Peru	1
Venezuela	1

International Collaborative Research Network

International collaborative laboratories

NAIST maintains several international research laboratories on campus and at partner institutions where faculty reside to facilitate collaborative research and strengthen institutional ties.

- ▶University of California Davis (USA)
- ▶University of British Colombia (Canada)
- ▶Université Toulouse (France)
- ▶École Politechnique (France)
- ▶National Yang Ming Chiao Tung University (Taiwan)

Overseas collaborative offices

In Asia, NAIST has established two overseas offices in Thailand and Indonesia as hubs for education and research collaboration to support its growing network of graduates and partner institutions, and maintains an office to promote collaboration projects in Indonesia as well.

- ▶NAIST Indonesia Office (located in the IPB University Alumni Building)
- ▶NAIST Thailand Office (located in the Kasetsart University Faculty of Engineering)
- ▶UGM-NAIST Collaboration Office (located in the Gadjah Mada University Biotechnology Research Center)

Agreements on Academic Exchange with 94 Overseas Institutions in 23 Countries/Regions

(As of April 2025)

NAIST's international network is centered upon our international partner institutions and the faculty and staff that continue to strengthen ties in both research and education. The academic agreements below are achieved through extensive collaboration and their contents cover areas including research collaboration, symposia, guest lectures, faculty and student exchange, and the sharing of scientific information and materials.

Institution Level Agreements

Asia

Bangladesh
Bangladesh University of Engineering and Technology
China
Institute of Genetics and Developmental Biology, Chinese Academy of Sciences
Tianjin University of Technology
Liaoning University
Northeast Normal University
India
KIIT College of Engineering
Indira Gandhi Delhi Technical University for Women（IGDTUW）
SRM Institute of Science and Technology
Indonesia
Universitas Gadjah Mada
IPB University
Universitas Indonesia
Universitas Hasanuddin
Institut Teknologi Bandung
Universitas Jenderal Soedirman
Electronic Engineering Polytechnic Institute of Surabaya
Institut Teknologi Sepuluh Nopember
Universitas Muhammadiyah Surakarta
Korea
Hanbat National University
Malaysia
Universiti Sains Malaysia
University of Malaya
Universiti Teknologi Malaysia
Universiti Tunku Abdul Rahman
Universiti Kebangsaan Malaysia
Philippines
Ateneo de Manila University
University of the Philippines Diliman
Taiwan
National Yang Ming Chiao Tung University
The National Taiwan University of Science and Technology
National Cheng Kung University
National Taipei University of Technology
Thailand
Mahidol University
Chulalongkorn University
Kasetsart University
Chiang Mai University
King Mongkut's University of Technology Thonburi
Vietnam
Hanoi University of Science, Vietnam National University
University of Engineering and Technology, Vietnam National University
Vietnam National University HCMC, University of Information Technology
Hue University of Sciences
University of Science and Technology of Hanoi

Europe

France
Univesité Toulouse
Ecole Polytechnique
Ecole Normale Superieure Paris-Saclay
Telecom Paris
Sorbonne Université
Univesité Paris-Saclay
University of Rennes
Ecole Normale Supérieure de Lyon (ENS de Lyon)
Université de Picardie Jules Verne
Université Bourgogne Franche-Comté (UBFC)
Germany
RWTH Aachen University
Justus Liebig University Giessen
Karlsruhe Institute of Technology
University of Regensburg
Coburg University of Applied Sciences and Arts
DFKI (The German Research Center for Artificial Intelligence)
Italy
University of Cagliari
University of Trento
UK
University of Edinburgh

North America

Canada
Queen's University at Kingston
USA
University of California Davis
University of California, San Diego
Lawrence Berkeley National Laboratory (LBNL), Joint Genome Institute（JGI）

South America

Brazil
Universidade Federal de São Paulo

Africa

Senegal
Cheikh Anta Diop University

Oceania

Australia
The University of Newcastle
New Zealand
Unitec Institute of Technology

School/Department Level Agreements

Information Science

Asia

China
School of Information Science and Engineering, Yunnan University
Korea
College of IT Engineering, Kyungpook National University
Vietnam
Faculty of Electronics and Telecommunications, HCMC University of Science, Vietnam National University
Department of Electronic and Telecommunication Engineering, University of Science and Technology - The University of Danang, Vietnam

Europe

Finland
Faculty of Medicine, University of Turku
France
Telecom SudParis
École Supérieure d'Ingénieurs en Électrotechnique et Électronique (ESIEE) Paris
École nationale supérieure d'ingénieurs de Caen (ENSICAEN)
Germany
Faculty of Engineering, Computer Science and Psychology, Ulm University
Department of Informatics, Technical University of Munich
Department of Electrical and Computer Engineering, Technical University of Munich
Faculty of Mathematics and Natural Sciences, Heinrich Heine University Düsseldorf

South America

Brazil
Departments of the University of San Paulo

Biological Science

Asia

Bangladesh
School of Health and Life Sciences, North South University
China
College of Life Sciences, Nanjing Agricultural University
School of Life Sciences, Nanjing University
Vietnam
Institute of Biotechnology, Vietnam Academy of Science and Technology

North America

Canada
Faculty of Science, University of British Columbia
USA
Biotechnology Institute, University of Minnesota

Materials Science

Asia

China
School of Chemistry and Chemical Engineering, Nanjing University
Taiwan
Institute of Biophotonics, National Yang Ming Chiao Tung University
Vietnam
Institute of Materials Science, Vietnam Academy of Science and Technology

Europe

Austria
Institute of Solid State Physics, Graz University of Technology
Germany
Faculty of Engineering, RheinMain University of Applied Sciences
Netherlands
Faculty of Science, Leiden University

North America

USA
Macromolecular Science & Engineering program, University of Michigan

Screening of International Students by Special Recommendation (Doctoral and Master's Course)

In addition to the regular entrance examination, NAIST offers a special entrance examination for students, faculty members, researchers or graduates of our partner institutions. To find out more, please visit our website.

International Students and Admissions

Double Degree Programs

In the double degree program, students are enrolled at NAIST and one of our partner institutions, and upon completing the program, following research guidance from both institutions' faculty, receive degrees from both institutions. Currently, NAIST offers doctoral course double degree programs with 6 international partner institutions and a master's course double degree program with Kasetsart University.

Partner institution	Country/region	Faculties, colleges, and areas	Research areas at NAIST
Université Toulouse	France	All fields with a counterpart in NAIST	All divisions
Université Paris-Saclay	France	All fields with a counterpart in NAIST	All divisions
Ulm University	Germany	Computer Science and Engineering Science	Information Science
National Yang Ming Chiao Tung University	Taiwan	①College of Science ②College of Electrical and Computer Engineering ③College of Engineering	All divisions
Chulalongkorn University	Thailand	Faculty of Science ①Biochemistry and Molecular Biology ②Biotechnology	All divisions
Kasetsart University (Doctoral and Master's course)	Thailand	Faculty of Engineering	Information Science / Materials Science

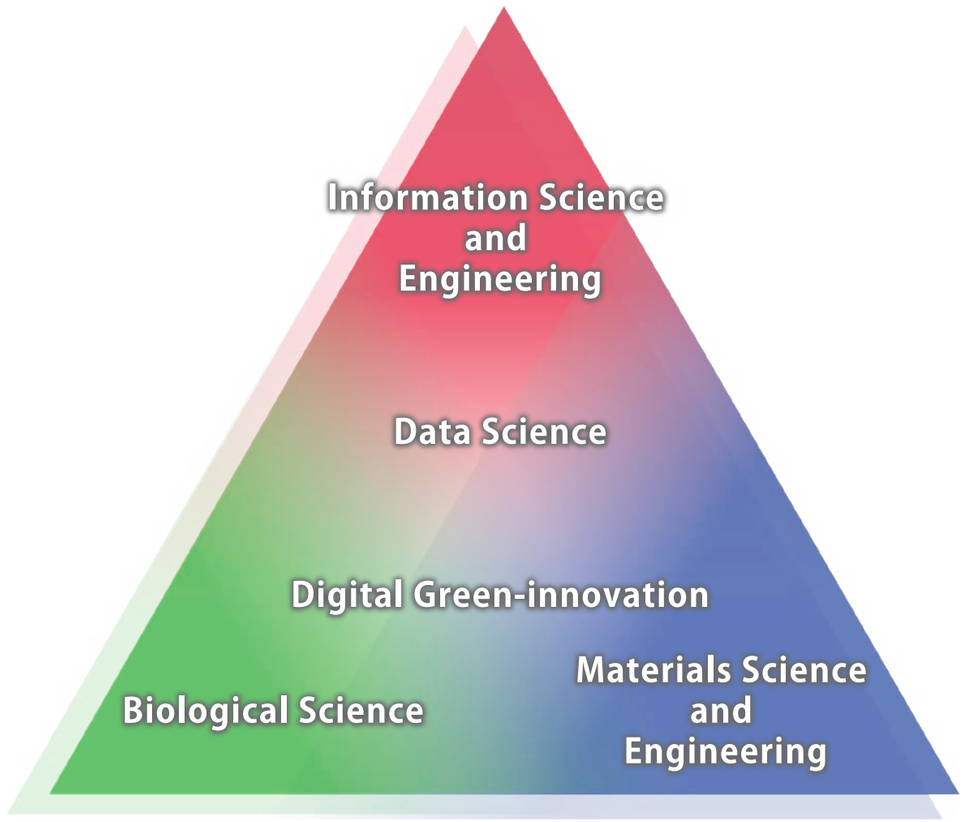
NAIST Educational Structure

Graduate School of Science and Technology

The Graduate School of Science and Technology was established to remove existing barriers between academic fields to form a flexible educational structure where faculty from related areas come together to perform education at the forefronts science and technology and to introduce an educational system for basic and specialized knowledge to prepare students for studies in diverse areas, and to allow them to reach beyond their specializations utilizing the knowledge and skills they attained in their undergraduate education. Additionally, in order to meet the ever-changing needs of society and to achieve real-world application, project-based learning and other practical educational projects led by invited researchers and engineers from private industry, etc. are incorporated into the curriculum.

Multidisciplinary-Focused Education Programs

The five Education Programs of the Graduate School of Science and Technology span the three original fields of research at NAIST (information, biological and materials sciences) and include the developing interdisciplinary fields that emerge independent of traditional academic divisions to pursue current trends in science and technology. All laboratories belong to one or more Education Program and students choose the type of degree they will pursue depending on their studies and the focus of their research.



Education Programs

Facilitating Research in Leading-edge Science and Technology

Information Science and Engineering

Degrees granted: Master's / Doctorate (engineering, science)

A focused program fostering students to support our dynamic advanced information society, implementing further achievements in diverse fields. This program cultivates specialized knowledge and skills in computer hardware/information network technology, computer/human interaction and media technology, and computer systems to utilize robotics.

Biological Science

Degrees granted: Master's / Doctorate (biological science)

A focused biological science program which fosters students who are able to contribute to the development of humankind and the conservation of the global environment through research and development related to the environment, energy, food and natural resources, and human health and longevity by equipping them with cutting-edge knowledge and skills in a wide range of fields, from the basic principles of life phenomena to the diversity of living organisms in animals, plants, and microorganisms.

Materials Science and Engineering

Degrees granted: Master's / Doctorate (engineering, science)

A focused program fostering students with foundational knowledge of materials science and advanced knowledge to fully utilize their expertise in a program spanning solid state physics, device engineering, molecular chemistry, polymeric materials and bionano-engineering, and undertake next generation science and technology to maintain affluent living and support societal development.

Data Science

Degrees granted: Master's / Doctorate (engineering, science, biological science)

An interdisciplinary program fostering students with a wide range of expertise in data- and AI-driven sciences in information, biological, and materials sciences, to find hidden 'value' and 'truth' through data processing, visualization, and analysis of huge amounts of data to contribute to science, technology, and societal development.

Digital Green-innovation

Degrees granted: Master's / Doctorate (engineering, science, biological science)

An information science, biological science, and materials science interdisciplinary program which fosters students with advanced expertise in information science, biological science, and materials science which support society and the economy, as well as comprehensive backgrounds to understand the adjacent interdisciplinary research fields, especially the interdisciplinary fields that encompass green and digital fields. These students can approach issues from various perspectives throughout society and will lead the utilization of digital green science and technology, which continues to develop in the green and digital fields, and innovation in society.

Education Programs That Can Be Selected for Each Division

		Information Science and Engineering	Biological Science	Materials Science and Engineering	Data Science	Digital Green-innovation
Division	Information Science	○			○	○
	Biological Science		○		○	○
	Materials Science			○	○	○

Areas of Research and Education

Information Science

Information Science Page

Computer Science and Artificial Intelligence

Computing Architecture

Prof. Yasuhiko Nakashima
Affiliate Prof. Mutsumi Kimura
Affiliate Prof. Renyuan Zhang
Assist. Prof. Yirong Kan
Assist. Prof. Hoai Luan Pham
Assist. Prof. Le Vu Trung Duong

One of JST's advanced carbon-neutral technology development and green computing bases. From supercomputing to IoT, we propose, assess, and disseminate new computational foundations essential for an energy-efficient society. Starting with simulator design and progressing through research processes encompassing implementation into high-capacity FPGAs and LSI design, students acquire skills to optimize systems across layers of devices, hardware, architecture, compilers, and applications for various data flow-centric processes. Such system architects distinguish themselves from ordinary engineers limited to off-the-shelf solutions, emerging as vital talents indispensable for the upcoming era of energy-efficient societies.

CGLA accelerators, AI accelerators, spike base training, mining LSI, cryptographic accelerators, stochastic computing, brain computing, large-scale FPGA/GPGPU/LSI environments, quantum emulators, medical signal processing, speech translation hardware

Dependable System

Prof. Michiko Inoue
Affiliate Prof. Fukuhito Ooshita
Assoc. Prof. Wenyuan Wang
Affiliate Assoc. Prof. Michihiro Shintani
Assist. Prof. Ryota Eguchi
Assist. Prof. Taisho Sasada

Today's information society is supported by advanced technologies at various levels, including applications, networks, computers, and VLSI. The Dependable System Laboratory conducts research on systems that users can rely on at all levels, including distributed systems, multicore computers, VLSI, brain-inspired computers, quantum computing, and security.

Distributed algorithms, population protocols, mobile agent algorithms, reliability of neuromorphic computers, quantum information science, zero-trust architecture design, differential privacy

Ubiquitous Computing Systems

Prof. Keiichi Yasumoto
Assoc. Prof. Hirohiko Suwa
Assist. Prof. Tomokazu Matsui
Assist. Prof. Wataru Sasaki

Our goal is to realize IoT technology to acquire data from things in the real world, AI and digital twin technologies to efficiently and accurately analyze acquired data, and feedback technology to effectively reflect the findings of analysis in the real world, which are necessary for the realization of Society 5.0. Our laboratory conducts education and research from both theoretical and practical perspectives, ranging from basic research on various elemental technologies to the construction of actual systems that use these technologies.

IoT/CPS, ubiquitous computing, mobile computing, edge computing, participatory/social/mobile sensing, behavior change, federated learning, digital twin, affective computing, privacy protection

Large-Scale Systems Management

Prof. Shoji Kasahara
Assoc. Prof. Takanori Hara
Assist. Prof. Yu Nakahata
Assist. Prof. Christopher Wiraatmaja

The Large-Scale Systems Management Laboratory research aims to develop mathematical modeling and simulation techniques for optimal design, control and architecture of large-scale systems such as computer/communication networks, with which the resulting systems achieve high performance, low vulnerability and high energy efficiency.

Queueing theory, game theory, machine learning, algorithms, graph theory, mathematical analytics, network optimization, blockchain, incentive mechanism design, data structure, zero-knowledge proof

Software Engineering

Prof. Kenichi Matsumoto
Assist. Prof. Kazumasa Shimari
Assist. Prof. Youmei Fan

Our laboratory performs research and education on the fundamentals and innovative technological trends of software engineering, including how contemporary software development teams make and maintain software, especially when using open source software. Topics include code analysis at the project level for automated tool support, empirical mining software artifacts to test assumptions, and human communication at both project and larger ecosystem levels. We strive to help build, use and maintain software to benefit society.

Program analysis, programming education, open source software, software ecosystems, empirical studies, artificial intelligence, mining software repositories, software libraries, software security

Software Design and Analysis

Prof. Hajimu Iida
Assoc. Prof. Yutaro Kashiwa
Assist. Prof. Brittany Anne Reid
Affiliate. Prof. Kohei Ichikawa
Affiliate. Assoc. Prof. Toshinori Takai
Affiliate. Assoc. Prof. Yasushi Tanaka
Affiliate. Assist. Prof. Toshiki Hirao

We conduct research on the methods and technologies which support the design/development of software and cloud computing systems, focusing on the analysis/improvement of the software development process. Software technology is increasingly present in our daily lives, including various software-embedded machinery and electronic devices for homes, mobile telephones, and social infrastructures represented by cloud computing systems.

AI-assisted software development, repository mining, software design & verification, automated software testing, software processes

Cyber Resilience

Prof. Youki Kadobayashi
Assoc. Prof. Yuzo Taenaka
Affiliate Prof. Hiroyuki Inoue
Affiliate Prof. Kazuma Kobayashi
Affiliate Prof. Daisuke Miyamoto

Our laboratory pursues resilience of ICT-based society together with lab members and colleagues around the world. Our research ranges from theoretical to practical, and spans across broad technical fields, from binary code, methodology, to even law. The pursuit of resilience (toughness) is an ongoing challenge and central to our motivation.

Cybersecurity, Internet technology, IoT/CPS, privacy, edge computing, applied machine learning, software defined technology, operating systems, distributed systems, industrial control systems (ICS)

Information Security Engineering

Prof. Yuichi Hayashi
Assoc. Prof. Daisuke Fujimoto
Assist. Prof. Shugo Kaji
Affiliate Assoc. Prof. Youngwoo Kim
Affiliate Assist. Prof. Hikaru Nishiyama

Our laboratory conducts research on methods to ensure hardware safety, which is the bedrock of system information security. We also research to ensure system-level security, including the upper layers. In addition to students from information science fields, we also accept students who majored in electrical and mechanical engineering that wish to study the information field.

Hardware security, cryptographic hardware, embedded systems, side-channel analysis, electromagnetic information security, hardware Trojans, cyber-physical system security, sensor security, electromagnetic compatibility

Network Systems

Prof. Minoru Okada
Assoc. Prof. Takeshi Higashino
Assist. Prof. Dipanita Chakraborty

The scope of our laboratory includes wireless technologies such as beyond 5G mobile communication systems, satellite communications, wireless power transfer systems, and radio sensors. We educate our students from theoretical and practical perspectives of wireless technologies to achieve our research goals.

Wireless communications, wireless power transfer, digital broadcasting, satellite communications, wireless sensors, multiple input multiple output, radio over fiber, dynamic charging, intelligent reflection surfaces, electromagnetic theory, modulation and signal detection

Internet Architecture and Systems

Prof. Kazutoshi Fujikawa
Assoc. Prof. Ismail Arai
Assist. Prof. Arata Endo
Assist. Prof. Kibrom Araya Desta
Affiliate Prof. Shigeru Kashihara
Affiliate Assoc. Prof. Akira Yutani
Affiliate Assoc. Prof. Masatoshi Kakiuchi

Our research goal is to realize the next-generation ICT infrastructure technologies and services beyond current systems such as the Internet, Wi-Fi networks, and cloud systems, which can be used securely and conveniently. In order to achieve this, our research methods are not only computer simulations but also using actual systems and equipment operated in Information Initiative Center (ITC).

Big data analysis, computer/network operation technique, disaster relief computing/networking, HPC, cyber security, pervasive computing, Internet of Things

Applied Artificial Intelligence and Robotics

Natural Language Processing

Prof. Taro Watanabe
Assoc. Prof. Hidetaka Kamigaito
Assist. Prof. Yusuke Sakai
Affiliate Prof. Katsuhito Sudo
Affiliate Assoc. Prof. Akihiro Tamura
Affiliate Assist. Prof. Shohei Higashiyama
Affiliate Assist. Prof. Hiroki Teranishi
Affiliate Assist. Prof. Yusuke Oda

We perform research on natural language processing, computational linguistics and machine learning. Our primary focuses are on the fundamental techniques for language analysis, language generation and information extraction, and on the end applications, such as machine translation, summarization, question answering and grammatical error correction. We also work on language technologies that intersect with other areas, e.g., geography and vision.

Natural language processing, computational linguistics, machine learning, syntactic analysis, semantic analysis, information extraction, language generation, language grounding, machine translation, summarization, geography and language, vision and language

Human-AI Interaction

Prof. Sakriani Sakti
Assoc. Prof. Hailong Liu
Assist. Prof. Yasuaki Orita
Assist. Prof. Sumitaka Honji

We conduct cutting-edge research to develop communicative AI that listens, speaks, sees, and understands – across languages, modalities, and contexts. Our work spans multisensory interaction, simultaneous speech translation, spatially aware language AI, and diverse interactive systems including intelligent dialog systems with robots, interactive avatars, tele-existence systems, and AR/VR systems. Inspired by human development, we explore unsupervised and continual learning alongside multilingual and multimodal generative AI. We strive to build a future of collaborative intelligence where humans and machines interact seamlessly and meaningfully.

Human–machine interaction, zero-resource speech technology, GeoNLP, simultaneous speech translation, multilingual multimodal generative AI, collaborative intelligence

Social Computing

Prof. Eiji Aramaki
Assoc. Prof. Shoko Wakamiya
Assist. Prof. Shaowen Peng
Assist. Prof. Tomohiro Nishiyama
Assist. Prof. Shohei Hisada
Affiliate Assoc. Prof. Kaoru Sagara
Affiliate Assoc. Prof. Shuntaro Yada
Affiliate Assist. Prof. Wan Jou She

We are an interdisciplinary laboratory specializing in social media data mining and natural language processing (NLP), including large language models (LLMs), to address a wide range of social challenges. Our research spans medical informatics including clinical and pharmaceutical informatics, mental health and well-being estimation from crowd-sourced episodes, information recommendation systems, AI-powered conversational safety evaluated from medical, legal, and ethical perspectives, and human-AI collaboration. By combining computational methods with domain knowledge, we aim to generate actionable insights that contribute to socially impactful and responsible technologies.

Social computing, natural language processing, medical informatics, artificial intelligence, web engineering, machine learning, computational social science, information recommendation

Interactive Media Design

Prof. Hirokazu Kato
Affiliate Prof. Masayuki Kanbara
Affiliate Prof. Goshiro Yamamoto
Affiliate Assoc. Prof. Yuichiro Fujimoto
Assoc. Prof. Taishi Sawabe
Assist. Prof. Isidro Butaslac

Our vision is to introduce augmented reality, interactive robots, and comfortable self-driving cars into the everyday lives of everyone on this planet. We aim to develop truly practical methods and systems using these technologies in cooperation with experts in various fields, focusing on medicine, sports, and industry.

Augmented reality, virtual reality, human computer interaction, human robot interaction, computer vision, computer graphics, training systems, support systems, user interfaces, self-driving cars

Optical Media Interface

Prof. Yasuhiro Mukaigawa
Assist. Prof. Yuki Fujimura
Assist. Prof. Kazuya Kitano
Affiliate Prof. Takuya Funatomi
Affiliate Assist. Prof. Takahiro Kushida
Affiliate Assist. Prof. Seitaro Shinagawa

The research topics in our laboratory include computer vision, which aims to understand scenes from visual information obtained by a camera, and computer graphics, which generates rich visual information for humans. We aim to realize new interfaces that enable humans and machines to interact through optical media based on our cutting-edge research.

Computer vision, computer graphics, computational photography, development of sensing systems, deep learning, optical measurement, unconventional cameras, image analysis, 3D shape reconstruction, digital fabrication

Cybernetics and Reality Engineering

Prof. Kiyoshi Kiyokawa
Assoc. Prof. Hideaki Uchiyama
Affiliate Assoc. Prof. Nobuchika Sakata
Affiliate Assoc. Prof. Naoya Isoyama
Assist. Prof. Monica Perusquía-Hernández
Assist. Prof. Yutaro Hirao

We conduct research to create the "tools of the future" to realize an inclusive society where all people can maximize their abilities and help each other. In particular, by manipulating various sensations such as vision, we aim to live more conveniently, more comfortably, or more securely by offering "personalized realities" which empathize with each individual.

Virtual and augmented reality, human augmentation, wearable computing, affective computing, cognitive science, psychology, computer vision, human and environmental sensing, artificial intelligence, display hardware

Human Robotics

Prof. Takahiro Wada
Assoc. Prof. Hailong Liu
Assist. Prof. Yasuaki Orita
Assist. Prof. Sumitaka Honji
Affiliate Prof. Toshihiro Hiraoka

We conduct research studies on the intellectualization of robots, understanding human perception-action loops based on information science, and human machine system/human robot collaboration by combining them. We are aiming to define the quality of operational feeling and motion comfort in intelligent mechanical systems that interact with humans. Research questions include "What determines easiness of walking with an artificial leg?"

Human robot collaboration, robotics, human machine systems, human modelling, human machine interaction, cooperative control, biological cybernetics, motion perception, motion sickness

Robot Learning

Prof. Takamitsu Matsubara
Assoc. Prof. Kazuki Shibata
Assist. Prof. Yoshihisa Tsurumine
Assist. Prof. Hikaru Sasaki
Assist. Prof. Cheng-Yu Kuo
Assist. Prof. Yuki Kadokawa
Assist. Prof. Tomoya Yamanokuchi

Our laboratory performs research and educates students in robot learning (machine learning for robot intelligence), an interdisciplinary field of various fields such as machine learning, artificial intelligence, robotics, control engineering, signal processing, optimization, mechatronics, and multi-robot coordination.

Reinforcement learning, imitation learning, deep learning, active perception, multi-agent system, smart manufacturing, human-assistive technology (exoskeleton robots, EMG interface), industrial applications, vehicle autopiloting

Applied Artificial Intelligence and Robotics

Mathematical Informatics

Prof. Kazushi Ikeda
Assoc. Prof. Takatomi Kubo
Assist. Prof. Chie Hieida
Assist. Prof. Yuzhe Li
Assist. Prof. Renzo Roel Perez Tan
Affiliate Prof. Junichiro Yoshimoto
Affiliate Prof. Toshitaka Yamakawa
Affiliate Assoc. Prof. Tomoya Tamei
Affiliate Assist. Prof. Chizu Saeki

Our laboratory studies mathematical models in various fields such as computer science, mathematical biology, and applied informatics. Computer science includes machine learning and statistical science. Mathematical biology includes neuroscience, medical science, cognitive science, psychophysics and bioinformatics/multiomics. Applied informatics includes biomedical engineering, signal processing, computer vision and robotics. Mathematical models are everywhere!

Mathematical models, machine learning, computational neuroscience, cognitive science, biomedical signal processing

Biomedical Imaging Intelligence

Assoc. Prof. Yoshito Otake
Assist. Prof. Mazen Soufi
Assist. Prof. Yi Gu

Our laboratory focuses on advancing biomedical imaging intelligence to promote personalized, preventative healthcare. We integrate deep learning, computer vision and statistical modeling with CT, MRI, X-ray and ultrasound data to quantify musculoskeletal structures, detect disease and predict patient outcomes. Current projects include segmentation of anatomical structures, statistical shape analysis, 2D-to-3D shape recovery, and automated assessment of osteoporosis and sarcopenia. Collaborations with hospitals and industry enable large-scale, multi-institutional datasets and clinical validation. By combining rigorous algorithmic innovation with translational studies and regulatory science, we strive to deliver robust, explainable AI solutions that reach real-world medical practice.

Biomedical Images, artificial intelligence, medical image analysis, computational anatomy, computer integrated surgery

Computational Systems Biology

Prof. Shigehiko Kanaya
Affiliate Prof. Hidehiro Iida
Affiliate Prof. Tetsuo Sato
Affiliate Prof. Klaus Walter Lange
Affiliate Prof. Ming Huang
Assoc. Prof. MD. Altaf-Ul-Amin
Assoc. Prof. Naoaki Ono
Assist. Prof. Kamal Nasution Ahmad
Affiliate Assist. Prof. Fan Zhang
Affiliate Assist. Prof. Ryota Wakayama

We are incorporating state-of-the-art data modeling/manipulating techniques such as deep learning techniques to better our understanding of the system biology of plants. In collaboration with medical hospitals and other academic institutions, we are developing various biomedical technologies based on information technology and deep learning techniques.

System biology, metabolic pathways, drug discovery, digital biomarkers, medical image processing, deep learning, computer aided diagnosis, proactive healthcare

Computational Behavioral Neuroscience

Prof. Saori Tanaka
Assoc. Prof. Lin Cai
Assist. Prof. Hiroyoshi Ogishima
Assist. Prof. Wendyam Eric Lionel Ilboudo

To understand humans, we build behavioral models based on the information processing mechanism of the brain, investigate the principles of human behavior through verification using experimental and data-driven approaches, and conduct educational research on its application to society.

Computational neuroscience, behavioral modeling, neuroimaging, computational psychiatry, reinforcement learning

Biomedical Data Science

Prof. Koichi Fujiwara

The current AI boom relies heavily on the naïve assumption that processing cheaply-collected big data with high-speed computers can produce machines smarter than humans, driving deep learning's popularity. However, this overlooks the importance of human experience, rare or costly-to-obtain data, and the implicit knowledge held by experts. Our research deliberately emphasizes the value of small data, integrating expert insights and real-world knowledge into analyses. By developing new machine learning algorithms, mathematical models, and specialized medical AI systems that harness small data effectively, we aim to create unique value and contribute significantly to foundational advancements in medicine, neuroscience, and healthcare technologies.

Small data analysis, machine learning, biosignal processing, medical device and medical AI development, human-machine interface

Collaborative Laboratories

Communication

Affiliate Prof. Tomoharu Iwata
Affiliate Assoc. Prof. Yusuke Tanaka

Our laboratory performs research on machine learning and data mining methods that extract valuable knowledge from various types of data. In particular, we are interested in developing methods that can learn from incomplete data, such as a small amount of data, data with many missing values, aggregated data, and noisy data.

Machine learning, data mining, deep learning, meta-learning, social network analysis, learning from aggregated data, spatio-temporal analysis

Computational Neuroscience

Affiliate Prof. Motoaki Kawanabe
Affiliate Assoc. Prof. Norikazu Sugimoto

We aim to understand the human brain and to achieve new machine intelligence (artificial intelligence) based on brain information processing functions. We conduct research and educate students on computational neuroscience, cutting-edge machine intelligence and neurotechnology at ATR, an internationally recognized computational neuroscience center.

Computational neuroscience, machine intelligence, robot learning, brain machine interface, cognitive function, neurofeedback, computational psychiatry, statistical modeling, multi-modal brain imaging, brain decoding

Network-Human Interaction
(Advanced Technology Research Laboratories, Panasonic Corporation)

Affiliate Prof. Masashi Okada
Affiliate Assoc. Prof. Yohei Nakata

Our laboratory performs research on Humanware, which essentially extends the abilities of humans and supports better human life by the combination of sensor data and knowledge processing. We explore new research areas such as smart houses and robotics combined with human, social, and physical sciences.

Humanware, artificial intelligence, deep learning, edge AI, explainable AI, scalable AI, uncertainty in AI

Collaborative Laboratories

Symbiotic Systems

Adjunct Prof. Rui Ishiyama
Adjunct Assoc. Prof. Eiki Ishidera

We design solutions that utilize image sensing and recognition technology to solve technical issues that contribute to solving real social issues. We study knowledge acquisition technology for artifact metrics and object authentication, and conduct research and education from prototypes to practical applications.

Image recognition, artifact metrics, object recognition, laser speckle, knowledge acquisition, data collection, user interface, fine sensing, visualization

Multilingual Knowledge Computing

Adjunct Prof. Tomoya Iwakura
Adjunct Assoc. Prof. Masaru Fuji

Our laboratory belongs to Fujitsu Limited. Artificial Intelligence (AI) today uses vast amounts of data to make decisions. We are researching and developing such AI technologies including knowledge computing and its application that makes use of knowledge extracted from multilingual text with natural language processing. One of our principal objectives is to take AI to new levels and create new value for society and we are aiming to realize AI that will support greater business growth and efficiency for our customers.

Artificial Intelligence (AI), natural language processing, knowledge computing, knowledge graphs

Optical and Vision Sensing

Affiliate Prof. Masaki Suwa

Our laboratory performs research and educates students from both theoretical and practical perspectives, ranging from fundamental research to engineering. Our research results are applicable especially in the field of factory automation, healthcare, and social systems.

Physics-based vision, vision-based 3D measurement, sensor calibration, object detection/recognition, machine vision algorithms

Molecular Bioinformatics

Affiliate Prof. Kentaro Tomii
Affiliate Assoc. Prof. Kentaro Kawata

We are developing bioinformatics methods and tools to explore the functions and mechanisms of biomolecules such as proteins. We aim to discover knowledge in the field of lifescience using information engineering techniques and to provide analysis methods that compensate for information deficiencies in experimental data.

Computational molecular biology, bioinformatics, omics, structural bioinformatics, genomics, data science, databases

Digital Human

Adjunct Prof. Mitsunori Tada
Adjunct Prof. Akihito Murai
Adjunct Assoc. Prof. Tsubasa Maruyama

Our laboratory researches both humans and robots for realizing inclusive systems where they can collaborate and co-evolve. Our research includes theoretical studies on human behavior and robot control, and empirical studies on practical social systems such as manufacturing factories and small stores where humans and robots co-exist.

Digital humans, robots, digital twins, motion analysis, motion synthesis, computer vision, human-robot collaboration, human-robot co-evolution

Formal Verification

Adjunct Prof. Reynald Affeldt
Adjunct Assoc. Prof. Yusuke Kawamoto

Formal verification methods are mathematically rigorous techniques for checking the correct behavior of computer systems. We study the formal verification of software systems dealing with uncertainties, e.g., to guarantee the safety of cyber-physical systems and to rigorously verify and explain statistical programs and artificial intelligence.

Programming languages, formal verification, proof assistants, AI, logic, Rocq, type theory, cyber physical systems

High Reliability Software System Verification

Affiliate Prof. Naoki Ishihama

Our laboratory is focused on research into software verification methodologies to achieve high reliability and safety in software that must function properly under extreme environmental conditions. The research outcome will be expected to apply to practical use for systems that require high reliability not only in space systems but also in social core infrastructures.

Highly reliable software systems, safety systems, verification methodology, safety assurance methodologies, reliability

Multilingual Natural Language Processing

Affiliate Prof. Eiichiro Sumita
Adjunct Assoc. Prof. Chenchen Ding

Multilingual natural language processing is an important technology that is essential for domestic and international information distribution. This laboratory conducts research on systematic methods that can be applied to any language by clarifying language independence and language dependence for multiple languages, and conducts education and research on scalable algorithms that make full use of large-scale computational resources targeting various language data. The site of "Min'na no Jidou Hon'yaku @ TexTra" developed by the National Institute of Information and Communications Technology will be used for outreach activies.

Natural language processing, multilingual information processing, computational linguistics, machine translation, large-scale computing, multimodal information processing

Intelligent Robot Dialogue

Affiliate Prof. Koichiro Yoshino
Assist. Prof. Angel Garcia Contreras

We research dialogue functions and intelligent systems for communication robots, roughly divided into three categories: understanding, control, and generation. To realize dialogue robots working in the real world, multimodal situation understanding (grounding) using language, speech, and images is necessary. The generative system of the robot utilizes multimodal expressions such as text, speech, images, and robot movements. We also study dialogue control mechanisms: reasoning, decision making, and inference on the knowledge base.

Dialogue systems, dialogue robots, natural language processing, language understanding, multimodal processing, knowledge acquisition, inference, dialogue management, language generation, reinforcement learning

Multimodal Environment Recognition

Affiliate Prof. Yasutomo Kawanishi
Adjunct Assist. Prof. Motoharu Sonogashira

We promote research on computer vision and pattern recognition using sensors that observe the robot's surrounding environment. In particular, we focus on understanding the 3D environment, recognizing and tracking objects, understanding the details of people around the robot, and integration of multiple modalities.

Computer vision, pattern recognition, robot vision, surveillance, environment recognition, object recognition, person recognition, activity understanding, multimodal integration

Biological Science

Biological Science Page

Plant Biology Laboratories

Plant Developmental Signaling

Prof. Keiji Nakajima
Assoc. Prof. Tatsuaki Goh
Assist. Prof. Tetsuya Hisanaga

We study molecular and genetic mechanisms of plant development and growth control in response to environmental factors using Arabidopsis and liverworts as model systems. We develop unique microscopic systems and image processing techniques to analyze dynamic changes in the growth and functions of plant organs.

Plant growth regulation, enviromental response, roots, sexual reproduction, evolution, epigenetic regulation, Arabidopsis, liverwort, live imaging, artificial intelligence

Plant Metabolic Regulation

Prof. Taku Demura
Assist. Prof. Tadashi Kunieda
Assist. Prof. Miya Mizutani

Research and education on regulatory mechanisms of plant cell differentiation, cell wall, and molecule transport, mechanisms to control plant function, metabolism, and dynamics, and the creation of useful GM plants and trees such as light emitting trees, in order to solve environmental and energy problems and contribute to industry, through the utilization of woody biomass.

Woody biomass, plant cell wall, molecular breeding, mechanical property of plant, regulation of molecule transport, poplar, moss

Plant Growth Regulation

Prof. Masaaki Umeda
Assist. Prof. Ye Zhang
Assist. Prof. Nozomi Kawamoto

Our laboratory explores the autonomous mechanisms that maintain plant tissue and preserve genome stability, aiming to understand why plants do not develop cancer. We are also investigating how plants conserve energy to survive in changing environments. Additionally, we are developing technologies to enhance plant biomass production, contributing to solutions for global environmental challenges.

Plant organ growth, genome maintenance, environmental stress, biomass, cell cycle, DNA polyploidization, phytohormone

Plant Stem Cell Regulation and Floral Patterning

Prof. Toshiro Ito
Assoc. Prof. Nobutoshi Yamaguchi
Assist. Prof. Yuko Wada
Affiliate Assoc. Prof. Makoto Shirakawa

We are interested in a holistic view of gene regulation in plant reproduction, which leads to developmental robustness and coordination. We explore signaling and epigenetic control in stem cell maintenance, environmental response and fertilization. Our students work at the frontiers of plant molecular genetics, developing their research, presentation and writing skills.

Flower development, transcription factors, epigenetics, histone modification, hormone signaling, transcriptomes, epigenomes, molecular breeding, chemical biology, synthetic biology

Plant Physiology

Prof. Motomu Endo
Assist. Prof. Akane Kubota
Assist. Prof. Nozomu Takahashi

Focusing on the circadian clock and photoperiodism, our laboratory conducts theoretical and experimental research and education on how, when and where plants perceive time and seasons, and how they use this information to control their responses.

Circadian clock, photoperiodism, flowering, inter-organ/tissue/cellular communication, circadian rhythm, chronobiology, Arabidopsis, plants, plant physiology

Plant Immunity

Prof. Yusuke Saijo
Assist. Prof. Shigetaka Yasuda
Assist. Prof. John Jewish Arellano Dominguez
Assist. Prof. Kanako Inoue

Our laboratory performs research in the areas of plant-microbe interactions, with a focus on immune receptor signaling, signal integration between biotic and abiotic cues, plant-inhabiting microbes and microbiomes. We wish to elucidate the underlying molecular principles in model plants and crops, and apply the obtained knowledge to promoting sustainable agriculture.

Plant immunity, plant-microbe interactions, pattern recognition receptors, damage sensing, microbiomes, symbiosis, plant pathology, abiotic stress, environments

Plant Symbiosis

Prof. Satoko Yoshida
Assist. Prof. Mina Ohtsu
Assist. Prof. Takanori Wakatake

Our laboratory focuses on research of parasitic plants, especially Orobanchaceae parasitic plants that cause severe agricultural damage in Africa. We use molecular biology, genetics, microscopy, and bioinformatic techniques to elucidate the mechanisms of plant parasitism. We also work on the other plant-organism relationships, including plant-nematode interaction and hervivory by the golden apple snail on rice.

Parasitic plants, Striga, haustorium formation, molecular genetics, microscopy, transcriptome, genome analysis, evolution, chemical biology

Plant Secondary Metabolism

Prof. Takayuki Tohge
Assist. Prof. Shinichiro Komaki

Our laboratory focuses on the study of chemical diversity and metabolic polymorphism of plant secondary (specialized) metabolism by translational analysis of genomics, transcriptomics and mass spectrometry-based metabolomics, as well as functional annotation of key genes corresponding to the production of active phytoprotectants moderating environmental stress in plants.

Plant metabolism, chemical diversity, metabolic polymorphism, environmental adaptation, integrative omics approaches, comparative omics, cross-species comparison, genomic synteny, metabolic engineering, model plant to crop

Plant Regeneration and Morphogenesis

Assoc. Prof. Momoko Ikeuchi

Why can plants readily regenerate their bodies upon injury? We pursue the secrets of plants' regenerative capacity using molecular genetics, live imaging and single cell transcriptome analyses. Uncovering the secrets of plants' regenerative capacity will potentially benefit human life by improving various aspects of agricultural biotechnology including grafting and tissue culture.

Regeneration, cellular pluripotency, developmental plasticity, tissue cultures, grafting, imaging, transcriptomes, epigenetics, Arabidopsis thaliana

Biomedical Science Laboratories

Functional Genomics and Medicine

Assoc. Prof. Yasumasa Ishida
Assist. Prof. Toshiaki Shigeoka

All the faculty members in our laboratory, Ishida, Oka, and Matsuda, were educated and trained in medical schools. Therefore, as we focus on human diseases, we investigate the molecular mechanisms involved in their development and novel therapeutic strategies to treat them.

PD-1, self-nonself discrimination, cancer immunotherapy, HtrA1, age-related macular degeneration, CIBZ, methylated DNA-binding proteins

Molecular Immunobiology

Prof. Taro Kawai
Assist. Prof. Daisuke Ori
Assist. Prof. Norisuke Kano

The innate immune system is the first line of host defense that detects invading pathogens. However, aberrant activation of innate immune responses is closely associated with exacerbation of inflammatory diseases. Our aim is to uncover mechanisms that control innate immune responses using tools of molecular and cell biology, bioinformatics and genetically modified mice.

Innate immunity, inflammation, vaccines, adjuvant, autoimmunity, macrophages, dendritic cells, cell death, cancer, gene targeting

Molecular Medicine and Cell Biology

Prof. Shiro Suetsugu
Assoc. Prof. Tamako Nishimura
Assist. Prof. Hiroki Kawana

Each type of cells has a specific shape that is determined by the plasma membrane. Our lab will focus on the mechanisms connecting the membrane to the cytoskeleton for varieties of cellular functions including migration, proliferation, extracellular vesicles, and various events associated with morphological changes, in various disease conditions. We will integrate cell biology, molecular biology, biochemistry, and biophysics.

Molecular cell biology, biochemistry, biophysics, extracellular vesicles

RNA Molecular Medicine

Prof. Katsutomo Okamura
Assist. Prof. Masami Shiimori
Assist. Prof. Yuma Hanai

Our laboratory studies gene regulatory mechanisms mediated by small RNAs and RNA-binding proteins to understand how they contribute to human health. We also study the diversity of RNA-mediated antiviral defense mechanisms in invertebrates and its relevance in arthropod-borne diseases.

MicroRNA, regulation of miRNA processing, transcriptomes, siRNA, Argonaute, RNA-dependent RNA polymerase

Stem Cell Technology

Prof. Akira Kurisaki
Assist. Prof. Hitomi Takada
Assist. Prof. Atsushi Into

Our goal is to understand the mechanisms of tissue development from the viewpoint of stem cell differentiation. We are also interested in the tissue regeneration process because the tissue stem cells are activated and initiate differentiation upon damage.

Stem cells, differentiation, 3D culture, organoids, development and regeneration

Developmental Biomedical Science

Assoc. Prof. Noriaki Sasai
Assist. Prof. Takuma Shinozuka

Our laboratory is interested in the molecular mechanisms of development of the vertebrate central nervous system, and use chick, mouse embryos, and mouse stem cells as model systems. We also elucidate the mechanisms for the functional maintenance of mature neurons.

Developmental biology, molecular biology, cell biology, central nervous system, neurodegenerative disease, chick, mice, embryonic stem cells, retinal disease

Organ Developmental Engineering

Assoc. Prof. Ayako Isotani
Assist. Prof. Tatsuya Nakagawa

We are researching the formation of organs using interspecies chimeric animals in which mouse and rat cells coexist in one body. Through this research, we investigate the essential factors for organ development and the correct function of organs.

Interspecies chimera, organ formation, developmental engineering, regenerative medicine, genome editing

Systems Biology Laboratories

Microbial Interaction

Assoc. Prof. Daisuke Watanabe
Assoc. Prof. Yuichi Morozumi
Assist. Prof. Naoki Akasaka

We explore how microorganisms familiar to humans (e.g., yeast, lactic acid bacteria, and koji fungus) interact with other organisms and environmental factors to form complex ecosystems. Our research reveals microbial diversity at molecular, metabolic, and cellular levels and contributes to innovations in food science for better taste and health.

Microbial ecology, microbial interaction, environmental response, food fermentation, metabolic engineering, yeast, lactic acid bacteria, koji fungus

Organelle Control

Assoc. Prof. Yukio Kimata

Eukaryotic cells carry various membrane-enclosed organelles. The size, shape, and function of organelles vary depending on physiological and environmental conditions. When cells are forced to highly produce secretory proteins, the endoplasmic reticulum (ER) becomes overwhelmed, leading to accumulation of unfolded proteins in the ER. To mitigate such stress conditions, cells enforce and enlarge the ER. We investigate the molecular mechanism of this cytoprotective response, namely the unfolded protein response (UPR), using yeast Saccharomyces cerevisiae. Moreover, through artificial induction of the UPR, we generate yeast strains that abundantly produce commercially variable heterogeneous biomolecules, such as human secretory proteins used as biopharmaceuticals.

Yeast, stress response, protein secretion, metabolic engineering, gene expression

Biological Science

Systems Biology Laboratories

Environmental Microbiology

Prof. Shosuke Yoshida
Assist. Prof. Min Fey Chek
Assist. Prof. Yuting Liu
Assist. Prof. Kazuo Kobayashi

We study the unique metabolic capabilities of microorganisms at the cellular and molecular levels. Furthermore, we aim to develop technologies that contribute to solving environmental problems and the realization of a sustainable society by utilizing microbial functions. A recent focus is poly(ethylene terephthalate) biodegradation.

Microbiology, metabolic engineering, enzymology, imaging, protein engineering, microbial screening, protein structure, bioinformatics

Structural Life Science

Prof. Tomoya Tsukazaki
Assist. Prof. Ryoji Miyazaki
Assist Prof. Hidetaka Kohga
Assist. Prof. Ken Kitano

In cells, various proteins are involved in a variety of fundamental biological phenomena. To unveil such mechanisms coupled with dynamic interactions and structural changes of biomolecules, including proteins, we conduct basic research through structural biologic analyses in combination with other newly developed methods.

Protein science, structural life science, structural biology, protein structure, protein interaction, protein complexes, protein transport, molecular dynamics, molecular mechanisms, crystallography

Gene Regulation Research

Prof. Yasumasa Bessho
Assoc. Prof. Takaaki Matsui
Assist. Prof. Norihiro Kitagawa
Assist. Prof. Yasuko Inaba

We are clarifying the principles of animal development and growth using mice and zebrafish as model systems. We bring together various technologies, including genetics, molecular biology, bioimaging technology, pharmacology, bioinformatics, mathematical modeling, and nanotechnology to tackle the mystery of life.

Developmental biology, mice, zebrafish, live imaging, gene editing, body plans, transcription factors, biological clocks, collective behavior, regeneration

Systems Neurobiology and Medicine

Prof. Naoyuki Inagaki
Assist. Prof. Kentaro Baba
Assist. Prof. Takunori Minegishi

We are analyzing the mechanisms of neural circuit formation, cell migration, synaptic plasticity, and cancer metastasis.

Neurobiology, cell biology, biochemistry, developmental biology, single molecule imaging, systems biology, mechanobiology

Bioengineering

Prof. Ko Kato
Assist. Prof. Takehide Kato
Assist. Prof. Tomomi Wakabayashi
Assist. Prof. Taizo Tamura

In our laboratory, we are performing research and education on the development of basic technology for efficiently producing useful materials such as biopharmaceuticals in plants and the elucidation of the mechanisms controlling the phenotype of plants in order to contribute to society through biotechnology.

Production of useful materials in plants, environmental response in plants, regulation of gene expression, bioinformatics, machine learning, adaptive evolution in plants

Neural Regeneration and Brain Repair

Assoc. Prof. Taito Matsuda

Our research focuses on repairing the brain after injury by turning immune cells called microglia into neurons. Instead of using transplanted stem cells, we introduce single transcription factor, NeuroD1, to trigger this transformation inside the brain itself. In mouse models of stroke, this method helped replace damaged neurons and improved movement. We also studied how this change happens at the gene and chromatin levels. We believe that this approach could lead to future treatments for neurological diseases.

Cellular reprogramming, neurological disease

Data-driven Biology

Prof. Yuichi Sakumura
Assist. Prof. Toshiya Kokaji
Assist. Prof. Kenta T. Suzuki

Our laboratory analyzes experimental biological and medical data to build quantitative mathematical models and provide feedback for experimental design. We work to preprocess the data using domain knowledge, and then use machine learning and mathematical models to extract novel knowledge.

Cell migration, morphogenesis, tissue formation, trans-omics, disease diagnosis, disease risk extraction, machine learning, quantitative modeling, mechanobiology, image analysis software development

Affiliate Laboratory

Molecular Microbiology and Genetics

Visiting Prof. Masayuki Inui
Visiting Assoc. Prof. Takahisa Kogure

Basic research and education activities focus on the development of a biorefinery, a facility that integrates biomass conversion and environment-friendly production of fuels and other useful chemicals. To achieve this, smart cell technologies combining bio- and digital biotechnologies, integrated omics analysis and metabolic conversion techniques are employed to develop new microbial functions.

Smart cell technologies, applied microbiology, bio-production, high-efficiency bioprocesses, regulation of gene expression, systems biology, molecular biology, genome engineering, culture engineering, metabolomic analysis, metabolic engineering

Areas of Research and Education

Materials Science

Materials Science Page

Core Laboratories

Bio-Process Engineering

Prof. Yoichiroh Hosokawa
Assoc. Prof. Yaxiaer Yalikun
Assist. Prof. Yuka Tsuri
Assist. Prof. Naomi Tanga

Our laboratory promotes developmental research on high-precision and fast manipulation methodologies for biological materials, in which state-of-the-art laser technology is combined with microscope technologies. We have the world's top activities on cell manipulation and processing by femtosecond laser and have attracted attention as a pioneer of laser applications for biotechnology.

Femtosecond lasers, atomic force microscopy, micro-fluidic devices, cell manipulation, cell processing, laser-induced shockwaves, bio-applications, cell sorters, fluorescence imaging, photoporation, laser-induced crystallization

Solid-state Information Physics

Prof. Tomohiro Matsushita
Assoc. Prof. Ken Hattori
Assist. Prof. Sakura Takeda
Assist. Prof. Takanobu Jujo
Assist. Prof. Yusuke Hashimoto
Assist. Prof. Yuta Yamamoto

Our aim is to clarify the atomic structures, electronic states, and spatial configurations of dopants in solid systems, including thin films, interfaces, and precisely controlled three-dimensional shapes. To achieve this, we employ various analytical techniques and in-house-developed equipment for both research and education.

Atomic and electronic structures (dopants, thin films, surfaces, interfaces), three-dimensional shapes surfaces, photoelectron holography, electron diffraction, scanning tunneling microscopy, angle resolved photoelectron spectroscopy, electronic states, magnetism, luminescence, molecule adsorption and desorption, synchrotron radiation

Quantum Photo-Science

Prof. Hiroyuki Katsuki
Assist. Prof. Garrek Stemo

We develop techniques to manipulate the quantum properties of strongly-coupled systems, such as vibrational polaritons and cavity exciton polaritons. We utilize ultrafast laser pulses and apply optics-based experimental approaches to clarify and manipulate material properties from the viewpoint of quantum physics.

Coherent control, ultrafast spectroscopy, femtosecond lasers, vibrational polaritons, exciton polaritons, two-dimensional semiconductors, photo-induced phase transitions, laser microscopy

Applied Quantum Physics

Prof. Takayuki Yanagida
Assoc. Prof. Noriaki Kawaguchi
Assoc. Prof. Daisuke Nakauchi
Assist. Prof. Takumi Kato

Our laboratory studies scintillators and storage phosphors for solid state ionizing radiation detectors, and the coverage is synthesis of materials (single crystal, transparent ceramic, glass, organic-inorganic perovskite, and powder), photophysics and radiation detector properties.

Scintillators, scintillation detectors, dosimeters, thermally stimulated luminescence (TSL), optically stimulated luminescence (OSL), radiophotoluminescence (RPL), radiation detectors, phosphor, photoluminescence

Organic Electronics

Prof. Masakazu Nakamura
Assoc. Prof. Hiroaki Benten
Assist. Prof. Ryota Fukuzawa

Our laboratory pursues the development of novel electronic devices using organic materials based on applied physics and chemistry. Our research is unique in that we develop original research tools to characterize organic thin films and low-dimensional materials, and realize entirely new fabrication methods and structures of devices which are distinctive from conventional ones.

Organic electronics, energy harvesting, thermoelectric generators, solar cells, thin-film transistors, molecular orientation, Seebeck effect, thermal management, scanning probe microscopy, CNT, proteins, polymer semiconductors, hybrid perovskite

Photonic Device Science

Prof. Kiyotaka Sasagawa
Assist. Prof. Ryoma Okada

In our laboratory, we are conducting cross-disciplinary research, from the design of original optoelectronic devices based on microelectronics technology to their applications. Specifically, we are developing novel photonic devices and systems such as retinal prosthesis, implantable functional brain imaging devices, near-infrared color imaging, and visualization of high-frequency electric fields.

Smart CMOS image sensors, implantable devices, retinal prosthesis, optogenetics, near-infrared imaging, lensless imaging, high frequency electric field imaging

Thin Film Semiconductor Devices

Assoc. Prof. Kosuke O. Hara
Assist. Prof. Candell Grace Paredes Quino

Our research includes the development of highly functional thin film semiconductor devices and the investigation of the physical principles linking the crystal growth, texture, and physical properties of semiconductor thin films. We employ a flexible approach to research, selecting computational, data science, and experimental approaches, including density functional theory calculations, device simulations, virtual screening of materials, thin film deposition, physical property analysis, and device fabrication. A representative outcome is the design of limiting efficiency BaSi2 solar cells using device simulation and computational material screening.

Solar cells, thin-film transistors, silicide semiconductors, oxide semiconductors, virtual screening

Photonic and Reactive Molecular Science

Prof. Tsuyoshi Kawai
Assoc. Prof. Tsumoru Morimoto
Assist. Prof. Wataru Ishii

Our group explores for photo-functional organic molecules and reactions, promoting social progress and protecting the environment. Students join the research activity on organic synthetic chemistry, development of new chemical and photochemical reactions, and photofunctional materials such as organic dyes and coordination substances, and even metal-organic nanomaterials. Our focus encompasses innovative molecules for remote-controlled photo-induced stereo/enantio-selective catalysis, conversion of light information as well as light-energy with molecular photo-response. Furthermore, from the perspective of organic reaction chemistry, our goal is the realization of green chemistry on the basis of carbon neutrality.

Photochromic dyes, photo-triggered reactions, chirality, stereo/enantio-selective catalyses, circularly polarized luminescence, transition metal catalyst, future displays, light emitting devices, lanthanides, fluorine chemistry, carbon neutral, green chemistry, photopolymerization

Biomimetic and Technomimetic Molecular Science

Prof. Gwenael Rapenne
Assoc. Prof. Kazuma Yasuhara
Assist. Prof. Toshia Nishina
Assist. Prof. Yohei Hattori

We are designing and synthesizing molecules which can act as machines at the nanoscale, including motors, gears and nanocars. We are also developing biologically-active molecules by mimicking natural molecular machines.

Molecular machines, organic chemistry, coordination chemistry, gears, nanocars, bioactive molecules, polymer chemistry, artificial membranes, interface chemistry, amphiphiles

Functional Organic Chemistry

Prof. Naoki Aratani
Assist. Prof. Ryoko Oyama

We focus on the development of functional organic materials including organic semiconductors, highly fluorescent dyes, near-infrared (NIR) dyes, and carbon nanomaterials. In particular, we are fascinated by beautiful and huge organic structures with high symmetry.

Functional organic materials, nano-carbon chemistry, organic photochemistry, emissive dyes, molecular design

Functional Inorganic Materials Design

Prof. Tomoyo Goto

Our research group focuses on environmentally friendly ceramics synthesis via liquid-phase processes. We aim to develop novel synthesis methods and to finely tune the functional properties of ceramics for advanced applications such as environmental purification, biomaterials, and chemical sensors.

Ceramics, functional inorganic materials, environmental purification materials, bioceramics, crystal morphology

Materials Science

Core Laboratories

Functional Supramolecular Chemistry

Prof. Shun Hirota
Assoc. Prof. Takashi Matsuo
Assist. Prof. Naoya Kobayashi
Assist. Prof. Tsuyoshi Mashima

We are performing new interdisciplinary research in chemistry, biology, and pharmacy. Based on the chemical knowledge of the functions and structures of biomolecules at molecular level, our laboratory focuses on the elucidation of protein mechanisms and design/application of bio-supramolecules using various analytical methods, protein engineering techniques, and organic syntheses.

Supramolecules, proteins, nanobiotechnology, bioinorganic chemistry, protein science, biophysical chemistry, biofunctional chemistry, organic synthesis, coordination chemistry, catalytic reactions, function control, enzymatic reactions, metalloprotein, chemical modification, genetic mutation, analytical methods, pharmacy, hemoglobin, antibodies, protein drugs, biocatalysts, AI-based protein design

Complex Molecular Systems

Prof. Hironari Kamikubo
Assoc. Prof. Sachiko Toma
Assist. Prof. Yoichi Yamazaki
Assist. Prof. Kento Yonezawa

Our laboratory focuses on the autonomous assembly-disassembly phenomena exhibited by complex molecular systems of proteins. Based on protein science and biophysics, we conduct research and education on the understanding of protein-molecule complex systems as potential targets for drug discovery and the development of next-generation protein-molecule complex materials.

Protein science, biophysics, structural biology, protein design engineering, x-ray solution scattering, x-ray & neutron crystallography, spectroscopy, recombinant DNA technology, structural proteins, protein transport systems, signal transduction systems

Nanomaterials and Polymer Chemistry

Prof. Hiroharu Ajiro
Assoc. Prof. Tsuyoshi Ando
Assist. Prof. Nalinthip Chanthaset
Assist. Prof. Ryohei Ikura

Based on the concepts of "molecular technology" and "precise polymerization", we prepare various polymer structures and create new polymer materials by controlling molecular design, polymer synthesis and polymer-polymer interactions. The target of their application is biocompatible materials, energy related materials, and environmentally friendly materials.

Biomaterial, degradable polymers, environmentally friendly material, energy related material, polymer synthesis, molecular design, nano structure, stimuli responsive property, gels, films

Materials Informatics

Prof. Mikiya Fujii
Assoc. Prof. Tomoaki Takayama
Assoc. Prof. Yosuke Harashima
Assist. Prof. Shogo Takasuga

In our laboratory, we study materials informatics. Our goal is to develop informatics analysis methods and their applications to improve material properties. In material science, experiments and theories have developed by interacting with each other. We are particularly interested in the technology that integrates and utilizes them.

Machine learning, artificial intelligence, computational materials science, photocatalysts/catalysis, auto-experiments, data-assimilation, generative models

Core Laboratories (Cooperative)

Data Driven Chemistry

Prof. Yukiharu Uraoka
Assoc. Prof. Tomoyuki Miyao
Assist. Prof. Akinori Sato

Chemoinformatics is a research area where chemical problems are tackled using tools coming from informatics. Our primary mission is to develop useful data analysis methodologies for experimental chemists/ biologists by incorporating theory and data-driven approaches. The methods developed by our group have a wide range of applications from drug discovery to material design.

Chemoinformatics, data-driven chemistry, virtual screening, drug discovery, in-silico modeling, machine learning, data analysis, process informatics

Metrology Informatics Laboratory

Prof. Shigetaka Tomiya
Assoc. Prof. Zentaro Akase
Assist. Prof. Kazunori Iwamitsu

We leverage data science to advance material analysis and metrology techniques essential for creating cutting-edge semiconductor materials and devices. Utilizing these innovative technologies, we aim to address technical challenges and uncover fundamental principles critical to the realization of advanced materials and devices.

Metrology informatics, materials analysis, data science, electron microscopy, semiconductor materials and devices

Core Laboratories (Collaborative)

Mesoscopic Materials Science

Adjunct Prof. Yasuyuki Naito
Adjunct Prof. Hiroyuki Tanaka
Adjunct Assoc. Prof. Hiromasa Tamaki

Our laboratory performs research and educates on exotic devices utilizing new physical phenomena in the mesoscopic region that take advantages of thin-film technology and computational science. Specifically, we are conducting research on novel semiconductor devices and materials for energy conversion and carbon neutrality including photovoltaic cell and high-performance transistors.

Mesoscopic, nano-technology, thin-film, functional materials, energy conversion materials

Functional Polymer Science

Adjunct Prof. Komei Okabe
Adjunct Prof. Mamoru Matsuda
Adjunct Assoc. Prof. Kazuhiro Kudo

Our laboratory focuses on material discovery and formulation design for ocular drug delivery in the treatment of ocular diseases. We explore the innovative DDS platform to efficiently penetrate target ocular tissues and educate students by synthesizing, analyzing, and evaluating novel materials, such as functional polymers and cell-penetrating peptides.

Drug delivery systems (DDS), ophthalmology, formulation design, chemical synthesis, functional polymers, cell penetrating peptides

Ecomaterial Science

Adjunct Prof. Katsunori Yogo
Adjunct Prof. Junichiro Kugai
Adjunct Assoc. Prof. Tomohiro Kinoshita

The Ecomaterial Science Laboratory, staffed by researchers of the Research Institute of Innovative Technology for the Earth (RITE), provides research and education on fundamental technologies to solve global warming issues. We endeavor to develop advanced materials for CO2 capture and H2 energy production, such as zeolite and amine-based materials.

Global warming, CO2 capture, CCUS, zeolites, amine-based materials, mesoporous materials, polymeric materials, metal organic frameworks (MOF), inorganic membranes

Advanced Functional Materials

Adjunct Prof. Joji Kadota
Adjunct Prof. Mari Yamamoto
Adjunct Assoc. Prof. Shohei Maruyama

Polymers, ceramics and metals are materials used widely in industry from structural to a variety of functional uses. We devote our efforts to develop new functional materials from them to be applied in advanced industry. We focus on the development of biomass-based plastics based on fine controlled polymer synthesis, and all-solid-state lithium battery, for realization of environmentally-conscious materials, and next generation electronic, optical, and energy devices.

Biomass-based polymers, precise polymerization, all solid-state lithium-ion secondary batteries, redox-flow battery, high energy density

Collaborative Laboratories

Interfaces, Molecules and Materials

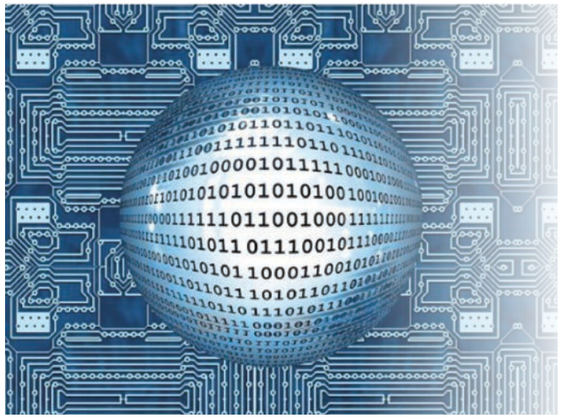
Adjunct Prof. Blanca Martin Vaca
Adjunct Assoc. Prof. Claire Kammerer

Our laboratory has extensive expertise in the organocatalyzed ring-opening polymerization (ROP) of lactones and cyclic carbonates for the synthesis of tailor-made biodegradable polymers. In recent years, our research has increasingly focused on the design and development of innovative monomer structures. We are actively synthesizing novel lactones and cyclic carbonates, which, upon organocatalyzed polymerization, enable access to new classes of biodegradable polymers featuring diverse pendant functional groups. These structural modifications impart unique physicochemical properties, thereby expanding the application potentioal of the resulting materials.

Organocatalyzed polymerization, biodegradable polymers, functionalized polymers, lactones, cyclic carbonates

Research Centers

Data Science Center (DSC)



The Data Science Center (DSC) was established to develop data-driven science across the fields of Information Science, Biological Science, Materials Science and their interdisciplinary fields and to cultivate new interdisciplinary areas within these fields. The center consists of the Data Science Division, the Bioinformatics Division, the Materials and Informatics Division, the International Education and Research Collaboration Division, and the Division for Research Transformation (RX). The center serves as a common foundation for education and research, promoting data-driven science throughout the university and playing a central role in implementing the Data Science Program.

Center for Digital Green-innovation (CDG)

The Center for Digital Green-innovation (CDG) creates next-generation digital green science and technology to address social challenges by integrating digital information technologies, such as AI and IoT, with digital I/O technologies, including nano sensors, eco-devices, and materials, building on the university's bioscience research. The Center promotes innovation that contributes to the implementation of a bio/green economy with a reduced environmental and societal burden and to achieve the SDGs, which are common global goals, as well as developing human resources. The Center comprises the Division for Digital Green-innovation, the Division for Bioeconomy, and the Division for International Collaboration.

Medilux Research Center (MLC)

"Lux," the Latin word for light, symbolizes illumination and evokes the brilliance that comes from the convergence of wisdom across diverse fields and the hopes of society. The Medilux Research Center promotes collaborative research between medicine and engineering by integrating advanced optical technologies with NAIST's core areas of AI, biotechnology, and engineering. Through this fusion, the center aims to "illuminate" medicine (Medi) and drive innovation in healthcare. The center is composed of laboratories from the three divisions of the Graduate School of Science and Technology, all of which are engaged in collaborative medical-engineering research, and conducts research and education focused on diagnostics, therapy, and health, with advanced optical technology at its core.

Facilities

Information Initiative Center (ITC)

The Information Initiative Center (ITC) was established to centrally manage all computer network facilities, both hardware and software, at our university, as well as to provide useful services that help users to utilize our facilities. The ITC comprises two specialized groups: one consists of researchers and engineers responsible for the research, development, and operation of next-generation computer network system; the other consists of specialists who manage academic information services, including digital library service. Our goal is to support cutting-edge educational and research activities across various fields at our university while contributing to the development of a highly-advanced information society.

Life Science Collaboration Center (LiSCo)

Life Science Collaboration Center(LiSCo) was established in January 2023 to contribute to the advancement, deepening, and increased efficiency of life science and interdisciplinary research through the development of facilities and equipment as well as the introduction of cutting-edge technologies. In parallel, the center promotes shared use of its resources both within and outside the university and provides research support, thereby contributing to regional and international collaboration, industry-academia partnerships, and human resource development. LiSCo is composed of three divisions: the Division for Promotion of Life Science Research, the Division for Operation of Facilities and Equipment, and the Division for Research Collaboration Support. Each division is smoothly operated by dedicated researchers and technical staff with specialized expertise.

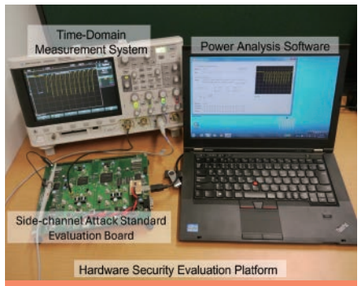
Center for Materials Research Platform (CMP)

Center for Materials Research Platform, CMP, is equipped with high-performance analytical instruments and staffed by skilled technical experts to support cutting-edge research in materials science for both internal and external researchers. The center collaborates with various institutions and integrates advanced technologies such as automation, remote operation, and research transformation (RX) approaches, including smart material synthesis and data mining techniques. Through these efforts, the center actively supports the development of innovative materials technologies that lead the world.

Information Science

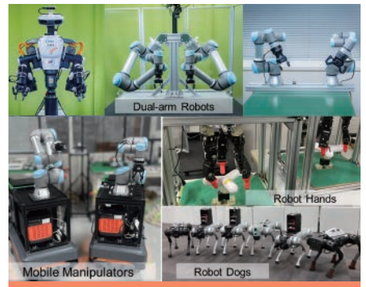
IMAX2/3/4: General Purpose Coarse Grained Linear Array Accelerators

The demand for server performance in AI and security computing is rapidly increasing. However, rising energy consumption is a major concern. This system, a prototype of the IMAX series, supports sustainable computing for both IoT and data centers.



Hardware Security Evaluation Platform

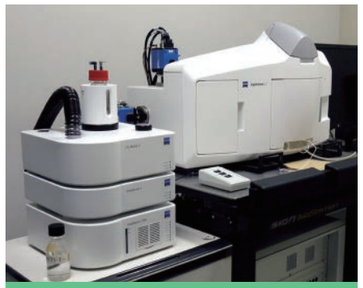
This platform evaluates hardware security anchors, which are crucial for system security, ensuring hardware integrity and thereby safeguarding the overall security across higher-layer systems.



Robotic Automation Research Platform

Our country' s declining productive population threatens the sustainability of labor-dependent industries and research. This platform supports the research and development of robotic technologies to automate various human tasks.

Biological Science by LiSCo



Light Sheet Fluorescence Microscope

Utilizes multi-angle sheet light to achieve fast 3D imaging with reduced phototoxicity, ideal for live imaging of animals, plants, and 3D cultures.

Flow Cytometer

Automated, high-efficiency analysis and sorting of cells/microorganisms; detects rare cells/proteins and supports multicolor analysis using fluorescent-labeled antibodies.

Next-Generation Sequencer

Reads 25 million DNA fragments (75-600 bases) simultaneously in 8-48 hours. Simple operation for mutation and transcript analysis, featuring Illumina MiSeq.

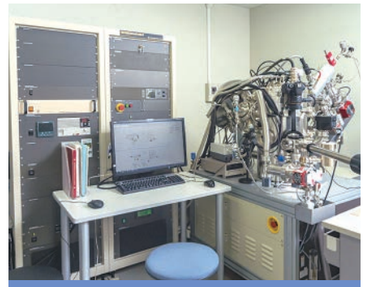
Materials Science by CMP

600MHz NMR

An instrument that irradiates a compound with radio waves and measures the resulting Zeeman effect (nuclear spin resonance).

TEM

This instrument enables observations with atomic resolution at a high accelerating voltage of 200 kV and a low accelerating voltage of 80 kV.Also it equips Dual EDS detectors providing high-speed elemental analysis, ADF-STEM providing atomic-level Z-contrast observation, and more.



XPS

A device that irradiates a sample with X-rays (usually Al Kα rays: 1486.6 eV) and measures the kinetic energy and number of photoelectrons generated to analyze the surface of about a few nanometer.

Student / Financial Support

Scholarships

Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) Scholarship

MEXT offers competitive, full scholarships to excellent overseas students and researchers to study in Japan, which include comprehensive support (Tuition and other fee exemption, monthly stipend, travel expenses), so they may focus on their studies and research. There are two types of scholarships, embassy and university recommendation. (International Priority Graduate Program, etc.)

NAIST International Scholar Program

This program is offered to talented partner institution students to study at NAIST while being Research Assistants, gaining valuable, hands-on research experience. NAIST Scholars are exempted from tuition and other fee payment, and receive a research assistantship salary and airfare to Japan.

Other Government and Private Scholarships

Every year a select number of privately financed international students receive JASSO and other private scholarships exclusively for NAIST students. Additionally, multiple scholarships specifically for international students are offered by private companies and foundations.

Other Financial Supports

Financial Support for Doctoral Students

In addition to other financial support, NAIST provides the following support for doctoral students.

NAIST Granite Program

Financial support (including a research budget) for selected talented students and various career support.

Priority to be hired as TA/RA

Support equivalent to roughly half the tuition fee through priority hiring as a TA/RA and additional benefits according to individual circumstances.

Active Support for Overseas Mobility

NAIST facilitates students in attending overseas conferences, participating in English training programs/overseas research opportunities through financial support from external research funds and grants.

Teaching and Research Assistantships

In addition to the NAIST International Scholar Program, NAIST actively supports exceptional students with teaching and research assistantships, where they receive a salary for taking on different roles in the lab and classroom.

Exemption from Enrollment & Tuition Fees

For students facing financial difficulties, NAIST provides full or partial exemption of enrollment and tuition fees. All students who met the criteria designated by NAIST have had their tuition fee fully/partially exempted in past 5 years.

Fees Without Exemption

Master's course / Doctoral course

Enrollment type	Examination	Enrollment	Tuition
Master's Doctoral Program Students	JPY 30,000	JPY 282,000	JPY 267,900/semester (JPY 535,800/year)

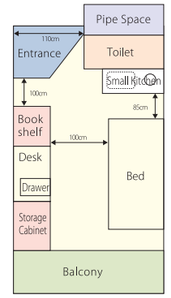
Research Students / Special research Students

Enrollment type	Examination	Enrollment	Tuition
Research Students	JPY 9,800	JPY 84,600	JPY 29,700/month
Special Research Students* (Short-term Exchange Students) Undergraduate Internship Students	—	—	JPY 29,700/month

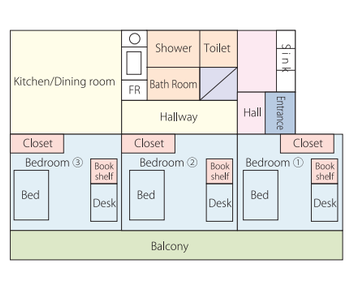
*Tuition may be waived for students from partner institutions.

On-campus Housing

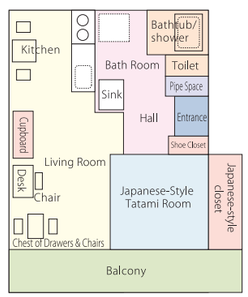
For international students studying in Japan, housing is an expensive and time-consuming issue. All full-time international students are eligible for on-campus housing. Housing fees range from JPY 12,000 - JPY 17,000 for single, couple or family housing, less than one third of average housing costs. A new apartment-style dormitory where Japanese and international students live together to foster cultural understanding opened in April 2021.



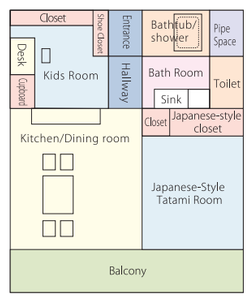
Single housing



Shared apartment-style housing

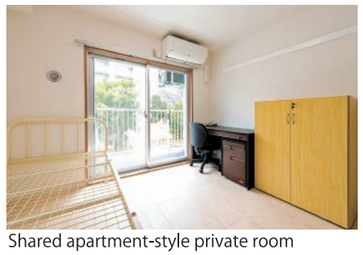


Couple housing



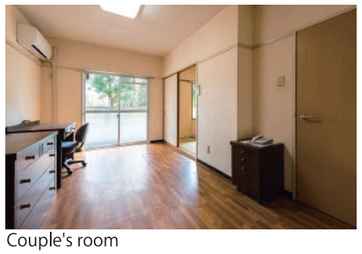
Family housing

Single room



Shared apartment-style private room

Shared apartment-style common area



Couple's room

Couple's kitchen

Pursuing my degree with my family in Japan

Kabalika Harun Humphrey

2nd year doctoral student from
Mathematical Informatics
(Division of Information Science)

My usual weekday

As a PhD student living on campus with my family, my weekdays involve balancing family and my studies. I start by helping my family prepare and taking my kids to school before heading to the lab. My mornings and afternoons are dedicated to research, classes, and lab time. Evenings are reserved for family time, including playing with my kids, having dinner and viewing social media to stay updated on news from my country and around the globe.

On my days off

On weekends, I enjoy spending quality time with my wife and kids, playing with them, visiting parks, or engaging in fun indoor activities like board games and crafts. I also attend online services for spiritual enrichment and connection. Additionally, I spend time with friends by meeting in person or chatting online. Weekends provide a fulfilling mix of family, social, and personal growth activities, allowing me to recharge and prepare for the week ahead.

Life in the dormitory

Life in the dormitory is convenient and supportive, allowing me to balance my academic responsibilities and family life effectively. The proximity to the library, convenience store, cafeteria, and recreational areas makes daily life easier and more efficient. Living in a diverse community of fellow students fosters meaningful interactions, cultural exchange, and mutual support.

My monthly budget

Housing: JPY31,000
Food and groceries: JPY40,000
Mobile phone: JPY6,000
Other expenses: JPY20,000

Student comment

Balancing studies, research, and personal life is key to success.

Focusing on my studies and enjoying Japan

Ilya Maisarah Binti Thariq

1st year Master's student from
Environmental Microbiology
(Division of Biological Science)

My usual weekday

My weekday schedule is pretty routine, with my lab's core working hours from 9:30 a.m. to 5:00 p.m. After that, I like taking walks, buying groceries, and knitting while watching movies. Every now and then, I go out to eat with my friends. One of my favorite places to visit is Musashi No Mori Coffee, especially for their seasonal pancakes.

On my days off

As someone who believes a person can never have too many hobbies, I love trying new things whenever I get the chance. Since coming to Japan, I've had the opportunity to try pottery, knitting, and even weaving! Beyond that, I love traveling around Japan. So far, I've visited 13 prefectures, and I'm hoping to explore even more before I graduate. I also volunteer at the Chokyu-Ji temple and Ikoma City Library.

Life in the dormitory

Living in the dormitory has been incredibly convenient, especially with the lab being just under 10 minutes away. It has saved me a lot of time and money on getting around. Plus, having my own personal kitchen is a big bonus! It can get pretty cold in the winter, but I make do with an electrical blanket and some comfy socks.

Student comment

Starting a new life in a new place can be daunting and lonely, but joining events both inside and outside of NAIST can be a great way to meet new people and create memorable experiences.

Student Activities and Events

One-Day Excursion

Japanese Summer Tradition

Enjoying Japanese Pottery Making

Celebrating the New Year with Calligraphy

Making Traditional Japanese Sweets

International Student Affairs Section (ISAS)

ISAS is the first office that international students deal with when they begin their procedures for studying at NAIST. Starting with admissions assistance and visa procedures, ISAS manages international student registration, offers administrative support for international students concerning their status in Japan and handles Japanese government and other scholarships. The experienced staff also offers advice to students as they live and study at NAIST. Additionally, the section works with a citizen group to maintain a Japanese language program and arranges Japanese cultural excursions every year.

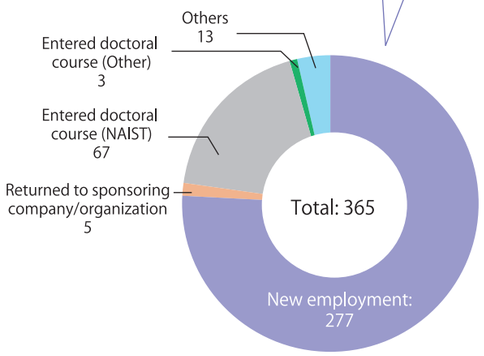
Center for International Students and Scholars (CISS)

CISS was started as part of NAIST's commitment to supporting its growing international community, which consists not only of students, but also students' families, international researchers and faculty, and their families as well. CISS cooperates with administration offices across the campus to offer support in areas both on and off campus, while also working with local government offices to assure the international community in and around NAIST are able to make the most of their time at NAIST and in Japan.

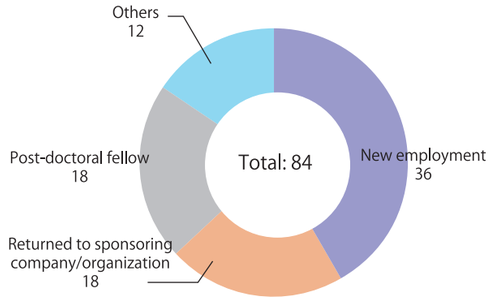
Careers After NAIST

Paths after Graduation

98% of graduates looking for employment found positions



〈 Master graduates in academic year 2024 〉



〈 Doctoral graduates in academic year 2024 〉

Division for Career Development (DCD)

Established in 2013, DCD provides a wide variety of career support to NAIST students who seek non-academic careers in Japan. In particular, a University Education Administrator (UEA) is employed specifically to support international students as they maneuver the unique and difficult to understand Japanese job hunting customs and procedures.

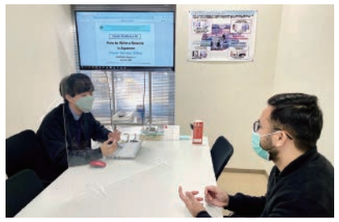
Career Support Programs for International Students

Career Guidance

Career guidance sessions to educate students on how to start and proceed with job hunting in Japan

Career Counseling

International student career consultation service available in English



Career Events

Career events for international students and HR/R&D divisions of Japanese companies with global vision

Reference materials for job hunting are available to read and borrow in our office.
It is also possible to read the job-hunting reports of our alumni.

Hear from Our Graduates

For More Information

Information Science

Kaplan Oral, Ph.D.
TOYOTA Connected Corporation
Country: Turkey
Completed doctoral course in 2019

Life in Japan

My adventure in Japan commenced thanks to the prestigious MEXT scholarship, an opportunity that opened the door to a life-changing experience. From the outset, Japan felt remarkably welcoming, quickly becoming a place I could call home. This sense of ease was significantly enhanced by the country's renowned safety; living here truly provides a unique peace of mind, making it feel like one of the safest places on earth. While I arrived with some proficiency in the Japanese language, my time here has offered far deeper insights. Interacting daily allowed me to learn beyond just words, gaining a richer understanding of the Japanese thought process, the warmth of its people, and the nuances of the culture. One of the absolute highlights of daily life has been exploring the country by bicycle. It's an unparalleled way to experience the landscape, and the cycling routes around the Hokusetsu area in Kansai are particularly spectacular.

My Experience at NAIST

Academically, I feel immense gratitude for the privilege of studying at the Nara Institute of Science and Technology (NAIST). My time here was further enriched by collaborative opportunities, such as working with the National Institute of Sports and Fitness in Kanoya. The learning environment at NAIST is exceptional; the guidance and wisdom shared by my professors were instrumental in shaping me into the researcher I am today. Furthermore, the support structures at NAIST are outstanding. The dedicated International Student Affairs Section, for example, provided invaluable assistance throughout my studies. The institute also thrives on its dynamic exchange of knowledge, hosting some of the best visiting researchers from both Japan and around the world, which created a truly stimulating academic atmosphere. My experience in Japan, centered around my studies at NAIST, has been profoundly rewarding and formative.

Career Outcomes SONY / NTT Group / DMG MORI Digital / Honda Research Institute Japan / Schneider Electric Japan / HORIBA / TOSHIBA / Rakuten Group / HIRANO TECSEED / TOYOTA Connected

Biological Science

Life in Japan

Stepping off the plane in Japan as a foreign student felt like entering a vibrant anime. My wonderful experiences, though hard to fully describe, were deeply rewarding, filled with cultural immersion, from cherry blossoms to tea ceremonies, and heartwarming connections with local and international students, fostering a strong sense of community. Living independently spurred significant personal growth, building resilience and problem-solving skills.
Of course, challenges existed. The initial language barrier and cultural adjustments required patience. Feelings of being different and homesickness arose. However, the strong societal support in Japan meant people consistently went the extra mile for me.
Ultimately, my journey as an international student in Japan was transformative. Despite the minor hurdles of language and culture, the profound cultural immersion, warm friendships, and significant personal growth far outweighed them. This experience broadened my horizons as a scientist and shaped me as a person.

My Experience at NAIST

Embarking on my PhD at NAIST has been an incredibly rewarding journey, largely due to the exceptional support system. My mentors provide invaluable guidance, blending profound knowledge with unwavering dedication to my growth. Regular meetings offer insightful feedback and encouragement.
Beyond mentorship, NAIST's administrative support is comprehensive. The international student office offered crucial assistance from arrival to daily life. Furthermore, the career advice office helped me understand the Japanese job market. This efficient network of friendly people and dedicated mentors has been instrumental in my academic and personal success, fostering a transformative experience to confidently step into my career.

Md Zobaer Hasan, Ph.D.
ROHTO Pharmaceutical Co.,Ltd.
Country: Bangladesh
Completed doctoral course in 2014

Career Outcomes SUNSTAR Group / KAO Corporation / ROHTO Pharmaceutical / Pharma Foods International / Mitsui Chemicals / SARAYA / Denka / CIEL / SATO YAKUHIN KOGYO / Chitose Laboratory

Materials Science

Joy Ann Panis, Ph.D.
Sanyo Chemical Industries,Ltd.
Country: Philippines
Completed doctoral course in 2022

Life in Japan

I first visited Japan when I participated in the week-long Sakura Science Student Exchange Program while I was completing my master's degree in the Philippines. It was my first time in the Kyushu region. I was impressed by the convenient transportation and the kindness of the people I met during my stay. When the program ended, I left Japan with a heavy heart, telling myself that I would return someday. Years later, here I am—working and building my career as a researcher in Kyoto. I'm enjoying the work-life balance and have had time to experience the culture, taste authentic food, and visit famous sites, both historical landmarks and natural attractions in Japan.

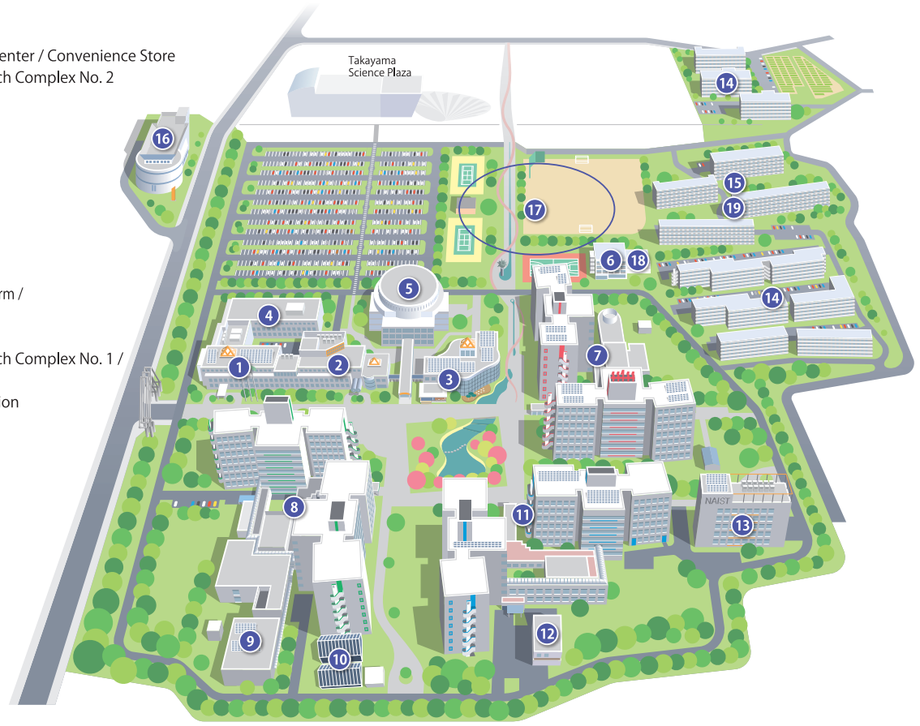
My Experience at NAIST

NAIST has been incredibly supportive since the day we arrived in Japan—from arranging dormitory accommodations to assisting with city hall registration, opening bank accounts, and even applying for credit cards. I arrived at NAIST a few months before the COVID-19 outbreak, but I was fortunate to participate in cultural activities organized by CISS before social events were suspended.
As a recipient of the Japan–France Double Degree Doctoral Scholarship Program, I had to travel between Nara and Paris during one of the most difficult times to travel—the height of the pandemic. While many students share stories of how fun their campus life is, I would like to express my gratitude to NAIST, my professors, and my colleagues, whose unwavering support with travel and medical requirements made everything more manageable.
NAIST truly stands by its students—even during the most challenging times.

Career Outcomes KIOXIA / artience / Sysmex Corporation / Sony Semiconductor Solutions / Nissan Chemical / Sanyo Chemical Industries / Nuvoton Technology Corporation Japan / Micron Memory Japan / Chevron Japan / Samsung Japan

Campus Map & Facilities

① Administration Bureau
② Library
③ University Union / Health Care Center / Convenience Store
④ Interdisciplinary Frontier Research Complex No. 2
⑤ Millennium Hall
⑥ Guesthouse Sentan
⑦ Information Science Complex / Information Initiative Center
⑧ Biological Science Complex / Life Science Collaboration Center
⑨ Animal Experimentation Facility
⑩ Botanical Greenhouses
⑪ Materials Science Complex / Center for Materials Research Platform / Medilux Research Center
⑫ Bio Nano Process Laboratory
⑬ Interdisciplinary Frontier Research Complex No. 1 / Data Science Center / Center for Digital Green-innovation
⑭ Student Dormitories
⑮ Staff Residences
⑯ Administration Bureau Annex
⑰ Sports facilities
⑱ NAIST daycare Scitech
⑲ Childcare Room Sentan



Convenience Store ③

The on-campus convenience store is open seven days a week and, in addition to foods and beverages, stocks daily amenities and offers utility and other payment services.

Health Care Center ③

The Health Care Center staff includes a doctor, nurses, and a counselor. They offer medical examinations and assistance, health guidance, and mental health counseling for students, faculty, and staff.

Guesthouse Sentan ⑥

The guesthouse offers reasonable short-term on-campus accommodations for visiting students, researchers, etc. to facilitate collaboration with both international and domestic partners.

Sports Facilities ⑰

NAIST maintains tennis courts, a basketball/volleyball court, a field for soccer/baseball, and the administrative office offer rental equipment to students, faculty and staff.

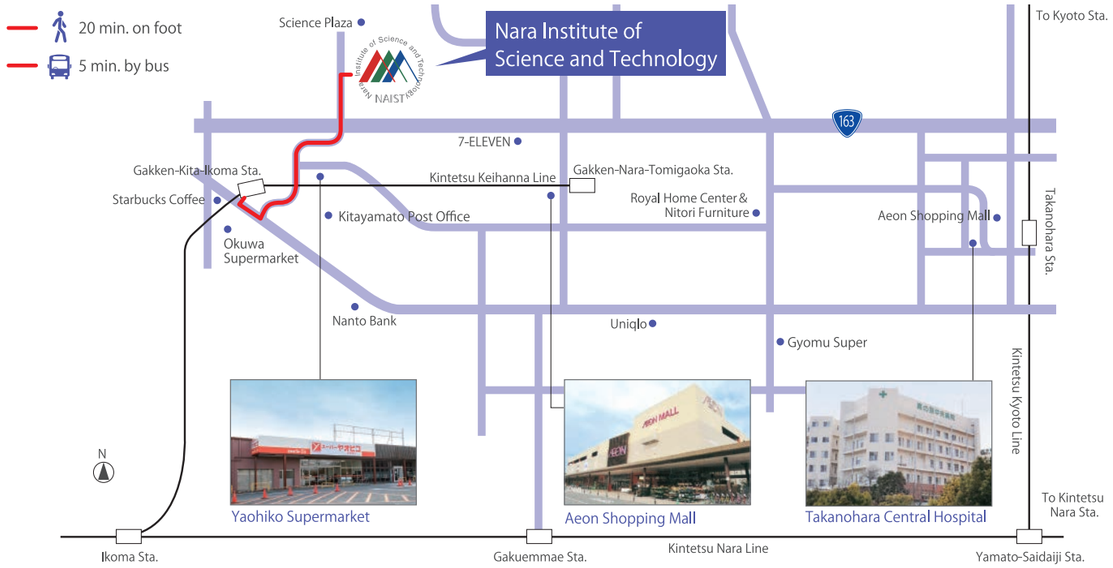
NAIST daycare Scitech ⑱

On-campus daycare is provided for faculty, staff, and students raising children. This daycare is for children aged 0 to 2 years old, with some children attending from outside NAIST. From the age of 3, children can attend either nearby Takayama Kodomo-en or Gakken Mayumi Hoiku-en.

Childcare Room Sentan ⑲

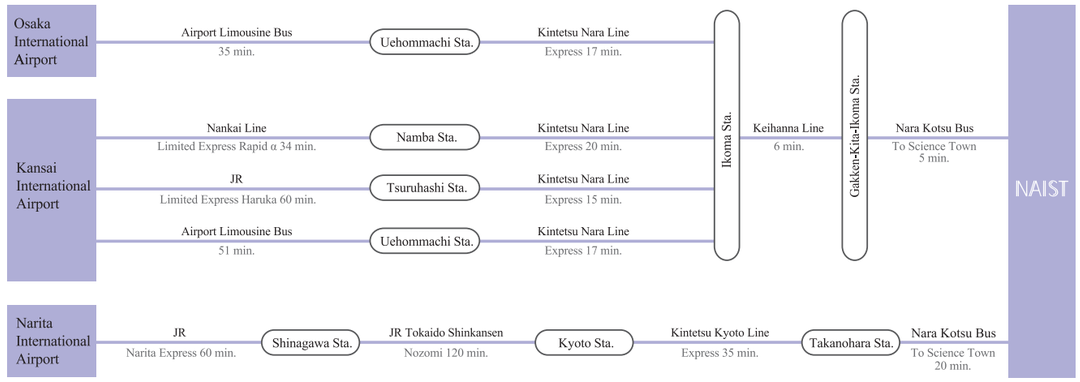
This room has been established along with various child and family care support programs as part of NAIST's efforts to support faculty and employees' work-life balance.

Around Campus



Reaching NAIST from Domestic Airports

NAIST is only 1.5 hours away from Osaka International Airport and Kansai International Airport



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Division of Information Science

Division of Biological Science

Division of Materials Science

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