Graduate Institute for Advanced Studies, SOKENDAL

Informatics Program

Five-year doctoral program / Three-year doctoral program

2023-2024

Earn a Ph.D. at the National Institute of Informatics

The National Institute of Informatics (NII) offers Three-year and Five-year doctoral program within The Graduate University for Advanced Studies, SOKENDAI, in which it constitutes Informatics Program.

Informatics Program provides a unique educational and research system where the National Institute of Informatics allows students access to advanced IT facilities and leading researchers in an international atmosphere.



Director General, National Institute of Informatics

KUROHASHI, Sadao

Cultivating creativity talents with an interdisciplinary perspective.

Informatics plays a crucial role in realizing a smart society, where innovative information technology continuously generates new values and services. As society undergoes rapid digitization, the significance of information technology and the need for real human interactions are being reevaluated. Informatics is a comprehensive academic discipline encompassing traditional information science and engineering, along with Al, data science, and digital humanities and social informatics.

The National Institute of Informatics (NII) conducts extensive research in informatics and maintains cutting-edge infrastructure for academic information dissemination. Collaborative research with domestic and international universities and research institutions contributes to the development of the information society. By linking research and education with business, the institute fosters innovative re-

search and education.

The Informatics Program at the Graduate University for Advanced Studies (SOKENDAI), supported by 20 joint-use institutions, is responsible for nurturing creative individuals with a broad perspective. Esteemed professors from the NII engage students in solving individual problems and developing high-level insight. The course focuses on project planning, completion, discovering and addressing new challenges, information gathering, and research presentation skills.

Motivated students are encouraged to join the Informatics Program, embarking on a journey to contribute to an advanced information society. Enrolling in this course will enable them to become well-rounded professionals capable of making a variable impact.



Chair, Informatics Program YAMADA, Seiji

Ultimating Informatics.

Informatics Program consists of six multi-disciplinary research fields: Foundations of Informatics, Information Infrastructure Science, Software Science, Multimedia Information Science, Intelligent Systems Science, and Information Environment Science. These fields cover not only traditional computer science and information engineering including AI, data science and mathematical modeling, but also social science including social modeling, social simulation. Our program is aiming at attacking problems in these domains from basic, applied, and practical points of view, and, at the same time, at educating and fostering not only researchers but also highly-skilled professionals, who will be next leaders in informatics.

Our program has the Five-year doctoral program and the Three-year doctoral program: the former is for students having a bachelor degree where students can sufficiently develop their research objectives, while the latter is for students who earned

a master degree where students can concentrate on research themes through enriching their research experiences. Our dual-degree program provides students with opportunities to go abroad to be supervised on their Ph.D. research topics at our partner universities/institutions. Moreover, students can study their research themes as international collaboration, participate in various research projects at NII, and are trained to play important roles as an international researchers. The fact that we have a high percentage of foreign students is also an important advantage of our program. Many lectures are available in English, many seminars at laboratories are held in English, and the students frequently have cross-cultural communication.

By offering an enriched cross-cultural environment, we aim at having our students trained with global perspectives and visions in having their extensive knowledge and high expertise in information.

Program outline

What is SOKENDAI?

The Graduate University for Advanced Studies, SOKENDAI is a graduate university with no undergraduate programs that consists of programs housed in affiliated Inter-University Research Institutes and Integrative Evolutionary Science Program attached directly to SOKENDAI. The Inter-University Research Institutes are research centers for joint use by universities throughout Japan in their various research fields. As such, these institutes serve as centers of advanced research in their respective research fields and as nodes of scholarly communication that support international joint research.

SOKENDAI was founded in October 1988 on the internationally unprecedented idea of educating graduate students at outstanding centers of research to cultivate future generations of scholars.

What is the National Institute of Informatics?

The National Institute of Informatics (NII) is an inter-university research institute corporation and a research organization of information and systems. The mission of this unique national academic research institute is to "create future value" in the new academic field of informatics. From the basic methodology of informatics to cutting-edge themes such as artificial intelligence, Big Data, the Internet of Things (IoT), and information security, NII features in a wide range of research activities. We push forward with fundamental research valued from the long-term view as well as practical studies aimed at resolving current social problems.

As an inter-university research institute corporation, NII has taken on the task of building and running essential research and education information infrastructures for Japan's academic community

Relation between the Informatics Program and the National Institute of Informatics

ROIS: Research Organization of Information and Systems

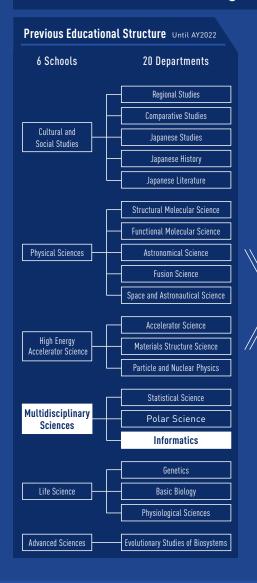
NII Faculty: 35 Profs, 23 Assoc. Profs, 14 Asst. Prof

Principles of Informatics Research Division Information Systems Architecture Research Division Digital Content and Media Sciences Research Division Information and Society Research Division Founding Institution - The Graduate University for Advanced Studies, SOKENDAI -

Informatics Program | Faculty: 31 Profs, 16 Assoc. Profs, 10 Asst. Profs

Foundations of Informatics Information Infrastructure Science Software Science Multimedia Information Science Intelligent Systems Science Information Environment Science

Relation Between Each Program at SOKENDAI and Each Inter-University Research Institute





1

Top-Level Research Environment

Students of the Informatics Program are taught and guided by top-level, world class researchers of the National Institute of Informatics. They also have the opportunity to use advanced research facilities not found at any other university. The high ratio of professors to students means close personal attention. A full-scale, thorough guidance system is in place: for their research, students are assigned one advisor, and two sub-advisors, meaning they can receive guidance and instruction from three professors.

2

Every student can work as a Research Assistant

Accepted students can apply to work as a Research Assistant (RA) at the National Institute of Informatics, and are eligible to receive financial assistance (except for working students, government scholarship recipients and SOKENDAI Special Researcher). Additional hourly wages are paid to students who show outstanding research abilities. The Graduate University for Advanced Studies, SOKENDAI also has a system for course-fee waiver applications.



Many graduates find work as researchers both in Japan and abroad

Many degree recipients of the Informatics Program are engaged in research, both in Japan and abroad. Not only does NII feature cutting-edge research facilities for students but, with a large contingent of foreign students, it also has an international atmosphere. Many students attend the numerous lectures and seminars given in English. For students looking to become researchers on the international stage, there is no better atmosphere to prepare them for this than the atmosphere provided at NII.









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Vice Chair MESSAGE

The graduate school for world-class researchers

Vice chair, Informatics Program (In charge of Research and Education) Takeda, Hideaki



The Informatics Program is installed in the National Institute of Informatics (NII), and research staff (professors and associate professors) of NII supervise SOKENDAI students. Since NII is an internationally well-known research institute in Informatics, researchers from all over the world come and work there. As a member of the institute, students will be able to learn and conduct research while experiencing international research daily. Students conduct their research under the supervision of

their professors and advisors, present their findings at international conferences and in journal papers, and receive their PhD degree. It is the mission of the Informatics Program: to foster world-class, top-level researchers by the world-class research staff and the environment. To assist the research activities of the students, the institute employs students (excluding working students and government-sponsored students) as research assistants to provide financial support for them.

Global Education Environment in the Informatics Program

Vice chair, Informatics Program (In charge of International Affairs) GOSHIMA, Masahiro



The Informatics Program is based on the National Institute of Informatics, which has international exchange programs with about 100 universities and institutions around the world, and conducts collaborative research activities in a full spectrum of informatics. In our program, more than half of the students are from foreign countries, and the lectures and research supervision are

mostly provided in English. We also have various kinds of scholarship programs as well as support for internships abroad, and the students are encouraged to present their research results at high-level international conferences. We aim to have our students acquire extensive knowledge and high expertise in the field of informatics with global perspectives in our cross-cultural environment.

Requirements for Ph.D.Degree

The following schedule for the Five-year and Three-year doctoral program have been set by the Program.

						1s	t Year											2r	ıd Year	•								
Spring Admission	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	Z	4 5	6	7
Five-year doctoral program	Ad	missi	on														Int	ermedia	te Evalu	ation	isserta	tion Pro	gress R	eport		Second	term	
Number of program credits for completion: 42 or more									18	months										4 m	onths							
Three-year doctoral program																										Admiss	ion	
Number of program credits for completion: 16 or more																												
						1s	10 11 12 1 2 3 4 18 months st Year 4 5 6 7 8 9 10					2r	ıd Year	-														
Fall Admission	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	- 1	0 11	12	1
Five-year doctoral program	Admission												Intermediate Evaluation Dissertation Progress Repor							eport		Second term						
Number of program credits for completion: 42 or more									17 mon	ths			Т							5 month	18							
Three-year doctoral program																												
Number of program credits for completion: 16 or more																										Admiss	ion	

Curriculum

The Informatics Program provides a unique educational and research system where the National Institute of Informatics allows students access to advanced IT facilities and leading researchers in an international atmosphere. In order to pass the Ph.D. program in the Informatics Program, students are expected to complete a number of credits from taught courses, to receive the necessary level of research guidance, and to pass a thesis examination.

Dissertation Work in Advanced Studies etc.

Dissertation Work in Advanced Studies IA~VB

The number of program credits

Robot Informatics

42 for Five-year doctoral program

16 for Three-year doctoral program

SHIGAKI, Shunsuke

Informatics Program

Subjects Under Research Guidance

Experiment and Seminar on Basic Knowledge in Informatics IA~IIB

All professors

Foundations of Informatics

Introduction to Mathematical Logic	TATSUTA, Makoto
Introduction to Algorithms	UNO, Takeaki
Logic in Computer Science	TATSUTA, Makoto
Discrete Mathematics	KAWARABAYASHI, Ken-ichi
Computational Complexity Theory	HIRAHARA, Shuichi
Computational Game Theory	Professors in Foundations of Informatics
Sublinear Algorithms	YOSHIDA, Yuichi
Algorithmic Market Design	Professors in Foundations of Informatics
Combinatorial Optimization for Machine Learning	FUJII, Kaito
Quantum Algorithms	SOEDA, Akihito

Information Infrastructure Science

	AIDA, Kento							
II. I D (TAKEFUSA, Atsuko							
High-Performance Computing	KOIBUCHI, Michihiro							
	ISHIKAWA, Yutaka							
	KURIMOTO, Takashi							
Information Sharing System Architecture	TAKAKURA, Hiroki							
Arciniceture	URUSHIDANI, Shigeo							
Community Contains Design	GOSHIMA, Masahiro							
Computer System Design	ISHIKAWA, Yutaka							
	FUKUDA, Kensuke							
Information and Communication Systems	KANEKO, Megumi							
Communication Systems	JI, Yusheng							

Software Science

Introduction to Software Science 1	All professors in
Introduction to Software Science 2	Software Science
Distributed Systems	SATOH, Ichiro
Software Engineering	ISHIKAWA, Fuyuki

Database Theory	KATO, Hiroyuki
Programming Languages and Theory	Professors in Software Science
Mathematical Structures in Formal Methods	HASUO, Ichiro
Software Verification	SEKIYAMA, Taro
Probabilistic Models in Informatics	KITAMOTO, Asanobu
Embedded Real-Time Systems	AOKI, Shunsuke

Multimedia Information Science

Introduction to Mu Information Scien	All professors in Multimedia Information Science							
	YAMAGISHI, Jun	nichi	KODAMA, Kazuya					
	IKEHATA, Sato	shi	M0, Hiroshi					
Fundamentals of Media Processing	SATOH, Shin'io	hi	KATAYAMA, Norio					
Media i rocessing	SUGIMOTO, Akil	hiro	AIZAWA, Akiko					
	KOYAMA, Shoi	chi						
Applications of	YAMAGISHI, Jun	ichi	SUGIMOTO, Akihiro					
Multimedia	SATO, Imari		IKEHATA, Satoshi					
Processing	MO, Hiroshi		KODAMA, Kazuya					
	ARAI, Noriko		YU, Yi					
Interactive Media	KATAYAMA, No	orio	KOYAMA, Shoichi					
	ASANO, Yuta							

Intelligent Systems Science

Introduction to	AIZAWA, Akiko	YAMADA, Seiji								
Intelligent	INOUE, Katsumi	KOBAYASHI, Taisuk								
Systems Science 1	SHIGAKI, Shunsuke									
	BONO, Mayumi	TAKEDA, Hideaki								
Introduction to	PRENDINGER, Helmut									
Intelligent Systems Science 2	MIZUNO, Takayuki	SUGIYAMA, Mahito								
•	SUGAWARA, Saku									

N. II D :	AIZAWA, Akiko
Natural Language Processing	SUGAWARA, Saku
Deep Learning	PRENDINGER, Helmut
Communication Environments	BONO, Mayumi
Data Mining	SUGIYAMA, Mahito
Knowledge Sharing System	TAKEDA, Hideaki
Communication Environments Data Mining	MIZUNO, Takayuki

Information Environment Science

Introduction to Information Environment Science	All professors in Information Environment Science
Practical Data Science	YAMAJI, Kazutsuna
ICT-enabled Business	OKADA, Hitoshi
Introduction to Statistical Methods in Bibliometrics	SUN, Yuan
Methodology of Scientometrics	NISHIZAWA, Masaki

Others

	KISHIDA, Masako
Applied Linear Algebra	SUGIMOTO, Akihiro
	SATOH, Shin'ichi
	KANEKO, Megumi
Scientific Presentation	WU, Stephen (Statistical Science Program)
Scientific Writing	JONES, Caryn (Visiting Lecturer)
	ECHIZEN, Isao
Introduction to Information Security Infrastructure	TAKAKURA Hiroki
	OKADA, Hitoshi
Introduction to Big Data Science	Professors related to Big Data

^{*}Scheduled subjects. In some cases there may be changes.

Timetable of the lectures and syllabus information is available at following website

 $\label{lem:website} Website of the Program \\ \hline \qquad \text{https://www.nii.ac.jp/graduate/en/curriculum/timetable/SOKENDAI website (curriculum)} \\ \hline \qquad \text{https://www.soken.ac.jp/en/education/curriculum/}$

3rd Year									4th Year											5th Year												
8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	1	0	11	12	1	2	3
														Inte	rim Pre	sentatio	n 1				Int	terim P	resenta	tion 2				Prelimi Evalua	minary Final Luation Evaluation			
				22 ma	nths				7 months										5 mont	ths			2 months 2 months									
														Inte	rim Pre	sentation 1					Int	terim P	resenta	tion 2				Prelimi Evalua	inary ation	Fina Evaluat		
					20 ı	months			7 months										5 mont	ths			2 mor	nths	2 mo	inths						
	3rd	Year							4th Year							5th Year																
2	3			6		8	9	10	11	12		2	3			6	7	8	9	10	11	12		2	3	4	4		6		8	9
									Interim Presentation 1							Int	terim P	resenta	tion 2				Prelimi Evalua		Fina Evaluat							
22 months									7 months							5 months							2 mor	nths	2 mo	nths						
									Interim Presentation 1						Interim Presentation 2						Prelimi Evalua	Preliminary Final Evaluation Evaluation										
					20 ı	months													7 month	s					5 mont	ths			2 mor	nths	2 mo	nths

Research Field and Advisors at the Program

Research Keywords and Major Research Papers Titles

Foundations of **Informatics**

Developing Mathematical Theories Underpinning All of Informatics

Foundations of Informatics studies theoretical underpinnings of informatics. In addition to their intrinsic importance, basic theories in informatics serve as foundations for wide application areas, including networks, software, and artificial intelligence. Special emphasis is placed on algorithm theory, mathematical optimization, and mathematics about computer programs.

KAWARABAYASHI, Ken-ichi Professor

Discrete Math, Graph Theory, Algorithm, Theoretical Computer Science [Papers]

- · Maximizing Time-Decaying Influence in Social Networks
- Coloring 3-Colorable Graphs with Less than n1/5 Colors

TATSUTA, Makoto Professor

Programming Logic, Lambda Calculus, Type Theory, Constructive Logic, Software Verification

[Papers]

- Equivalence of Inductive Definitions and Cyclic Proofs under Arithmetic
- Decision Procedure for Entailment of Symbolic Heaps with Arrays

UNO, Takeaki Professor

[Keywords]

Algorithms, Computation, Optimization, Data Mining, Data Engineering [Papers]

- · Micro-Clustering by Data Polishing
- · Listing Maximal Independent Sets with Minimal Space and Bounded Delay

YOSHIDA, Yuichi Professor

[Keywords]

Algorithms, Theoretical Computer Science, (Combinatorial) Optimizations [Papers]

- · A Characterization of Locally Testable Affine-Invariant Properties via **Decomposition Theorems**
- •Testing Assignments to Constraint Satisfaction Problems

HIRAHARA, Shuichi Associate Professor

Computational Complexity Theory, P versus NP Problem, Minimum Circuit Size Problem, Kolmogorov Complexity, Pseudorandomness

- · Non-Black-Box Worst-Case to Average-Case Reductions within NP
- NP-hardness of Minimum Circuit Size Problem for OR-AND-MOD Circuits

KISHIDA, Masako Associate Professor

[Keywords]

Control Theory, Optimization, Uncertain Systems, Networked Systems [Papers]

- · Event-triggered control with self-triggered sampling for discrete-time uncertain systems
- · Deep learning-based average consensus

MATSUMOTO, Keiji Associate Professor

Quantum Information, Quantum Computation, Statistics, Information Theory, Entanglement

[Papers]

- · Entanglement and Quantum Information Processing
- · Hypothesis testing for an entangled state produced by spontaneous parametric down conversion

SOEDA, Akihito Associate Professor

[Keywords]

Quantum algorithms, Quantum information theory

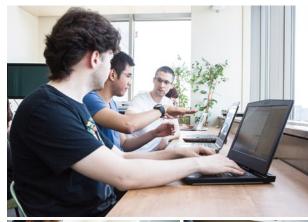
[Papers]

- Reversing unknown quantum transformations: A universal quantum circuit for inverting general unitary operations
- · Robust controllability of two-qubit Hamiltonian dynamics

FUJII, Kaito Assistant Professor

Combinatorial Optimization, Algorithms, Machine Learning

- · Beyond adaptive submodularity: Approximation guarantees of greedy policy with adaptive submodularity ratio
- · Fast greedy algorithms for dictionary selection with generalized sparsity constraints







Information Infrastructure Science

The Construction and Enhancement of Information Infrastructure

Computer systems and information-communication networks form the foundation of information systems. In Information Infrastructure Science field, lectures and research instructions are provided to address the theoretical and practical issues in the topics of computer architecture, parallel and distributed processing, high-performance and dependable computing, network architecture, protocol, security, resource management, and performance evaluation methodology.

AIDA, Kento Professor

[Kevwords]

Cloud Computing, IoT, Parallel and Distributed Computing [Papers]

- · A Portable Load Balancer for Kubernetes Cluster
- · Virtual Cloud Service System for Building Effective Inter-Cloud Applications

FUKUDA, Kensuke Professor

Internet Protocol, Traffic Measurement, Analysis and Modeling, Scale-Free Network, Small-World Network

[Papers]

- · Mining causality of network events in log data
- · An Evaluation of Darknet Traffic Taxonomy

GOSHIMA, Masahiro

[Keywords]

Computer Architecture, Microarchitecture, Digital Circuit [Papers]

- ·Out-of-Step Pipeline for Gather/Scatter Instructions
- · Application of Clocking Scheme That Enables Dynamic Time Borrowing

ISHIKAWA, Yutaka Professor

System Software, Operating System, Communication and File IO middleware, Parallel and Distributed Processing

[Papers]

- · Performance and Scalability of Lightweight Multi-Kernel based Operating Systems
- · Casper: An Asynchronous Progress Model for MPI RMA on Many-Core Architectures

JI, Yusheng Professor

[Keywords]

Network Resource Management, Mobile Computing

[Papers]

- · AVE: Autonomous vehicular edge computing framework with ACO-based scheduling
- · Accurate location tracking from CSI-based passive device-free probabilistic fingerprinting

KOIBUCHI, Michihiro Professor

[Kevwords]

Parallel Computers, Interconnection Networks, Network-on-Chip, System Area Networks, High Performance Computing [Papers]

- · A Case for Random Shortcut Topologies for HPC Interconnects
- · High-Bandwidth Low-Latency Approximate Interconnection Networks

KURIMOTO, Takashi Professor

[Kevwords]

Network Protocol, Network Node Architecture

[Papers]

- ·SINET5: A Low-Latency and High-Bandwidth Backbone Network for SDN/ NFV Era
- · Multi-campus ICT equipment virtualization architecture for cloud and NFV integrated service

TAKAKURA, Hiroki Professor

[Keywords]

Cyber Security, High Performance Network, Secure Networking, Data Mining [Papers]

- ·SPINZ: A Speculating Incident Zone System for Incident Handling
- · Construction of Secure Internal Networks with Communication Classifying

TAKEFUSA, Atsuko Professor

Parallel and Distributed Computing, Resource Management Technologies, Cloud Computing, Inter-Cloud, Edge Computing, IoT

[Papers]

- ·SINETStream: Enabling Research IoT Applications with Portability, Security and Performance Requirements
- ·Virtual Cloud Service System for Building Effective Inter-Cloud **Applications**

URUSHIDANI, Shigeo Professor

[Keywords]

Network Architecture, Network Service Systems

[Papers]

- Optimization model for designing multiple virtualized campus area networks coordinating with a wide area network
- · Robust optimization model for backup resource allocation in cloud provider

KANEKO, Megumi Associate Professor

[Keywords]

Wireless Communications, Mobile Networks, Internet-of-Things (IoT) wireless systems

- · Energy Efficient Resource Allocation Optimization in Fog Radio Access Networks with Outdated Channel Knowledge
- · Deep Reinforcement Learning-based User Association in Sub6GHz/ mmWave Integrated Networks

Research Field and Advisors at the Program

Research Keywords and Major Research Papers Titles

Software Science

Software: Enabling Technologies for IT

Software technology is the foundation of all industries and daily activities. In the era of widespread use of AI, software with high quality, functionality, and reliability is critical to building next-generation information systems. This field addresses relevant research questions in software science, including fundamental software technologies such as programming lanquages, software engineering, distributed systems, and advanced software technologies such as data engineering, machine learning, real-world data analysis.

HASUO, Ichiro Professor

Logic, Automaton, Category Theory, Formal Methods, Cyber-Physical System, Optimization, Machine Learning

[Papers]

- · Goal-Aware RSS for Complex Scenarios via Program Logic
- Expressivity of Quantitative Modal Logics : Categorical Foundations via Codensity and Approximation

KITAMOTO, Asanobu Professor

[Keywords]

Data-driven Science, Digital Humanities, Earth Environmental Informatics, Image Processing, Digital Archives, Open Science [Papers]

- · Differential Reading by Image-based Change Detection and Prospect for Human-Machine Collaboration for Differential Transcription
- · Situational Awareness from Social Media Photographs Using Automated Image Captioning

SATOH, Ichiro Professor

[Kevwords]

Cloud Computing, Ubiquitous Computing, Middleware, OS, Distributed Computing

[Papers]

- · A Component Framework for Adapting to Elastic Resources in Clouds
- · Toward Access Control Model for Context-Aware Services Offloaded to Cloud Computing.

TAKASU, Atsuhiro Professor

[Kevwords]

Data Engineering, Sensor Data Analysis, Text Mining

[Papers]

- · Kernel Clustering with Sigmoid Regularization for Efficient Segmentation of Sequential Data
- · Considering similarity and the rating conversion of neighbors on neural collaborative filtering

ISHIKAWA, Fuyuki Associate Professor

[Kevwords]

Software Engineering, Testing, Formal Methods, Software Engineering for Machine Learning-based Systems

[Papers]

- · Targeting Requirements Violations of Autonomous Driving Systems by Dynamic Evolutionary Search
- · NeuRecover: Regression-Controlled Repair of Deep Neural Networks with Training History

SEKIYAMA, Taro Associate Professor

Programming Languages, Type Systems, Formal Verification, Machine Learning

[Papers]

- · Signature Restriction for Polymorphic Algebraic Effects
- · Toward Neural-Network-Guided Program Synthesis and Verification

AOKI, Shunsuke Assistant Professor

[Keywords]

Autonomous Driving, Cyber-Physical Systems, Real-Time Systems, Embedded Systems, Mobile Robots, Internet of Things

[Papers]

- Dynamic intersections and self-driving vehicles
- · Cooperative perception with deep reinforcement learning for connected vehicles

KATO, Hiroyuki Assistant Professor

XML, Databases, Functional Programming, Xquery [Papers]

- ·DD0-Free Xquery
- Cell-based Provenance for Scientific Data







Multimedia **Information Science**

Information Systems, as "media" that appropriately offers relevant information This field studies a variety of different problems from "media": theories and technologies that are necessary for processing target information consisting of different media; theories and technologies as the foundation for efficiently handling large amounts of media information; basic technologies for media processing in general, such as pattern recognition and signal processing; and media utility for interactions between people and information systems or among people.

ARAI, Noriko Professor

[Kevwords]

Knowledge Sharing, Knowledge Base, Reading

[Papers]

- · Cognitive diagnosis models for estimation of misconceptions analyzing multiple-choice data
- · Can an A.I. win a medal in the mathematical olympiad? Benchmarking mechanized mathematics on pre-university problems.

SATO, Imari Professor

[Keywords]

Image-based Modeling and Rendering, Computational Photography [Papers]

- ·SymPS: BRDF Symmetry Guided Photometric Stereo for Shape and Light Source Estimation
- · Wetness and Color from a Single Multispectral Image

SUGIMOTO, Akihiro Professor

Computer Vision, Digital Geometry, Human-Computer Interaction [Papers]

- · Paired-D GAN for Semantic Image Synthesis
- · Modeling Large-scale Indoor Scenes with Rigid Fragments using RGB-D Cameras

YAMAGISHI, Junichi Professor

[Keywords]

Speech Information Processing, Machine Learning, Speech-Based Human Machine Interaction, Speech Database, Biometrics, Media Forensics [Papers]

- · Wasserstein GAN and Waveform Loss-based Acoustic Model Training for Multi-speaker Text-to-Speech Synthesis Systems Using a WaveNet Neural
- · ASVspoof: the Automatic Speaker Verification Spoofing and Countermeasures Challenge

KATAYAMA, Norio Associate Professor

Multimedia Information Processing, Multimedia Information Retrieval [Papers]

- The SR-tree: An Index Structure for High-Dimensional Nearest Neighbor Queries
- · Unsupervised Estimation of Video Continuity Model from Large-Scale Video Archives and Its Application to Shot Boundary Detection

KODAMA, Kazuya Associate Professor

Image Sensing, Image Restoration / Reconstruction, Image / Video Coding, Visual Communications

[Papers]

- · Efficient Reconstruction of All-in-Focus Images Through Shifted Pinholes from Multi-Focus Images for Dense Light Field Synthesis and Rendering
- · Robust removal of fixed pattern noise on multi-focus images

KOYAMA, Shoichi Associate Professor

Acoustic Signal Processing, Physics-informed Machine Learning, Inverse Problem, Spatial Audio, Active Control

[Papers]

- ·Sparse Representation of a Spatial Sound Field in a Reverberant Environment
- ·Spatial Active Noise Control Based on Kernel Interpolation of Sound Field

ASANO, Yuta Assistant Professor

[Keywords]

Computer Vision, Image processing, Physics-based vision, 3D reconstruction [Papers]

- ·Shape from Water: Bispectral Light Absorption for Depth Recovery
- · Coded Illumination and Imaging for Fluorescence Based Classification

IKEHATA, Satoshi Assistant Professor

Computer Vision, 3D Reconstruction, Multi-View Stereo, Photometric Stereo, Deep Learning

[Papers]

- ·From Bayesian Sparsity to Gated Recurrent Nets
- Panoramic Structure from Motion via Geometric Relationship Detection

MO, Hiroshi Assistant Professor

[Keywords]

Pattern Recognition, Video Content Analysis

[Papers]

- · Unsupervised Estimation of Video Continuity Model from Large-Scale Video Archives and Its Application to Shot Boundary Detection
- · Enhanced Visualization of News Shot Cloud with Employing Circular Layout

YU, Yi Assistant Professor

[Keywords]

Representation Learning, Deep Generative Models, Multimedia Content Analysis, Artificial Intelligence

- ·Category-Based Deep CCA for Fine-Grained Venue Discovery from Multimodal Data
- · Conditional LSTM-GAN for Melody Generation from Lyrics

Research Field and Advisors at the Program

Research Keywords and Major Research Papers Titles

Intelligent Systems Science

Al Technology Enhancing **Human Intelligent Activities** Artificial Intelligence (AI) is an emerging technologies that facilitates human intelligence activities using computer systems. The Intelligent Systems Science course provides students with a comprehensive understanding of various advanced research topics in intelligent systems and aims to cultivate skilled human resources capable of creating core technologies in intelligent systems.

AIZAWA, Akiko Professor

Natural Language Interface, QA, Knowledge Acquisition, Document Analysis, semantic parsing, dialogue systems

- · Language-Conditioned Feature Pyramids for Visual Selection Tasks
- · Constructing A Multi-hop QA Dataset for Comprehensive Evaluation of Reasoning Steps

INOUE, Katsumi Professor

Artificial Intelligence, Knowledge Representation and Reasoning, Machine Learning, Logic Programming

- · Learning from interpretation transition
- ·Logic programming in tensor spaces

PRENDINGER, Helmut Professor

[Keywords]

Artificial Intelligence, Deep Learning, Unmanned Aircraft Systems Traffic Management

[Papers]

- Decentralized multi-agent path finding for UAV traffic management
- · UAV-based situational awareness system using Deep Learning

SATOH, Ken Professor

[Keywords]

Reasoning, Knowledge Representation, Multi-Agent Systems, Machine Learning, Computational Logic, Legal Reasoning

[Papers]

- · Obligation as Optimal Goal Satisfaction
- · Modelling Last-act Attempted Crime in Criminal Law

TAKEDA, Hideaki Professor

[Kevwords]

Semantic Web, Knowledge Sharing, Community-Support System, Design Theory

[Papers]

- · Presenting and preserving the change in taxonomic knowledge for linked
- · Understanding massive artistic cooperation: the case of Nico Nico Douga

YAMADA, Seiji Professor

[Keywords]

Human-Agent Interaction, Human-Robot Interaction

[Papers]

- · Response Times when Interpreting Artificial Subtle Expressions are Shorter than with Human-like Speech Sounds
- · Expressing Emotions through Color, Sound, and Vibration with an Appearance-Constrained Social Robot

BONO, Mayumi Associate Professor

[Keywords]

Sociolinguistics, Conversational Informatics, Utterance, Embodied Action, Sign Language, Conversation Analysis, Social Interaction

- · Challenges for Robots Acting on a Stage: Creating Sequential Structures for Interaction and the Interaction Process with the Audience
- The Practice of Showing 'Who I am': A Multimodal Analysis of Encounters between Science Communicator and Visitors at Science Museum

MIZUNO, Takayuki Associate Professor

[Keywords]

Computational social science, Econophysics, Complex networks, Economic big data, Finance

- The power of corporate control in the global ownership network
- ·Structure of global buyer-supplier networks and its implications for conflict minerals regulations

SUGIYAMA, Mahito Associate Professor

Machine Learning, Data Mining, Statistics, Knowledge Discovery, **Bioinformatics**

[Papers]

- ·Tensor Balancing on Statistical Manifold
- · Legendre Decomposition for Tensors

KOBAYASHI, Taisuke Assistant Professor

[Kevwords]

Intelligent Robots, Machine Learning, Data-driven Control, Human-Robot Interaction

[Papers]

- ·Whole-Body Multicontact Haptic Human-Humanoid Interaction Based on Leader-Follower Switching: A Robot Dance of the "Box Step"
- · Optimistic Reinforcement Learning by Forward Kullback-Leibler Divergence Optimization

SHIGAKI, Shunsuke Assistant Professor

[Kevwords]

Intelligent Robots, Neuroethology, Data-driven Control, System Identification, Mechatronics

[Papers]

- ·Multisensory-motor integration in olfactory navigation of silkmoth, Bombyx mori, using virtual reality system
- · Modeling of the adaptive chemical plume tracing algorithm of an insect using fuzzy inference

SUGAWARA, Saku Assistant Professor

Natural language processing, Computational linguistics, Natural language understanding, Machine reading comprehension, Task design, Machine learning

- $\hbox{$\, \cdot $Assessing the Benchmarking Capacity of Machine Reading Comprehension Datasets }$
- · Evaluation Metrics for Machine Reading Comprehension: Prerequisite Skills and Readability

Information Environment Science

An Indispensable Academic System for Achieving the Information Society

The information environment is a new concept for viewing the following as a whole: information, information-communication infrastructures, information management, circulation and retrieval systems, people, and social foundations. It has been regarded as an indispensable academic system for achieving the information society. This field sets digital documents and academic information environments as the core subjects and studies the basics to application.

ECHIZEN, Isao Professor

Multimedia Security, Multimedia Forensics, Biometrics, and Privacy [Papers]

- · Generating Sentiment-Preserving Fake Online Reviews Using Neural Language Models and Their Human- and Machine-based Detection
- · MesoNet: a Compact Facial Video Forgery Detection Network

KANDO, Noriko Professor

[Kevwords]

Information Retrieval, Information Access Technologies, Text Processing, Evaluation Methodology and Metrics

[Papers]

- · Investigating Result Usefulness in Mobile Search
- · A Two-Stage Model for User's Examination Behavior in Mobile Search

YAMAJI, Kazutsuna Professor

Scholarly Communication, Database, Open Science, Research Data Management

[Papers]

- Specifying a Trust Model for Academic Cloud Services
- · Development and Deployment of the Open Access Repository and Its Application to the Open Educational Recourses

NISHIZAWA, Masaki Associate Professor

Scientmetrics, Bibliometrics, Research Trends, Statistical Analysis [Papers]

- · A Study on the Academic and Research Impact of Shared Contents in Institutional Repositories in Related to Performance Indicators of University Rankings
- · How is scientific research announced in a press release? Focusing on its relationships with journal indicators -

OKADA. Hitoshi Associate Professor

Electronic Commerce, IT-enabled Services, Electronic Money [Papers]

- · Impact of Nationality Information in Feedback on Trust in a Foreign Online
- · Evaluating the influence of country-related pictures on the perception of a foreign online store

SUN, Yuan Associate Professor

[Kevwords]

Personalized Learning, Cognitive Diagnostic Modelling, Knowledge Tracing, Bibliometrics

[Papers]

- · Modeling Learner's Dynamic Knowledge Construction Procedure and Cognitive Item Difficulty for Knowledge Tracing
- ·Research on the Development of Preprint Platform from the Perspective of Open Communication

Visiting Professors

HU, Zhenjiang

Software Science Visiting Professor

SATOH Shin'ichi

Multimedia Information Science Visiting Professor

PLANAS, Emmanuel

International Relations Visiting Professor

Annual Events at the Program

NII Open House

Every June, the National Institute of Informatics holds an open house where they present results from their latest research to the public. The event draws around 1,000 people annually. At this event, students from the Informatics Program have the opportunity to display posters detailing results of their own research and introduce their work to a large audience.





Ceremony to Present Commemorative Medals to Graduates

A special ceremony for students graduating with a Ph.D. degree in Informatics from SOKENDAI will be held at the National Institute of Informatics. Each graduate will be presented individually with a medal to commemorate their achievement





Students' Research



ODA, Yukihiro

Enrolled in 2018, 5-year Ph.D. course Main supervisor: Prof. TATSUTA, Makoto

I study basic theory for software verification. Software verification is to prove that programs satisfy requirements mathematically.

Especially, I am interested in verification with separation logic and cyclic proofs both of which come from mathematical logic, and I research mathematical properties of them. Actually, the basic properties of cyclic proofs are not known, so I am eager to investigate them

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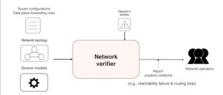


SHIIBA, Ryusei

Enrolled in 2021, 5-year Ph.D. course Main supervisor: Prof. FUKUDA, Kensuke

Today's computer networks have become large and complex, which is difficult for their operators to manage in manual. The difficulty sometimes leads to severe network failures.

To realize reliable network management, I am trying to develop techniques to automatically verify whether the operator's policies are satisfied on the networks. Especially, I develop new algorithms and data structures leveraging the mathematical feature and structure of the networks and scalable verification techniques for large-scale networks such as mobile networks and data center networks using them.



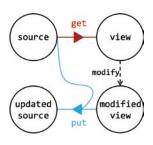


NGUYEN, Trong Bach

Enrolled in 2018, 5-year Ph.D course Main supervisor: Prof. HASUO, Ichiro

Bidirectional transformations (BXs) serve to maintain consistency between two representations of related and often overlapping information, one referred to as the source and the other as the view. When the view is modified, the source may need updating to restore the consistency. BXs are applied in many fields, for instance, databases, user interface design and model-driven development.

My research is mainly related to bidirectional programming which are means of constructing well-behaved BXs. I have proposed different interpretation methods to optimize the evaluation of bidirectional programs especially those formed by composing simpler programs. Currently I am studying the synthesis of bidirectional programs from given specifications that can be a set of input-out-put examples or refinement types.



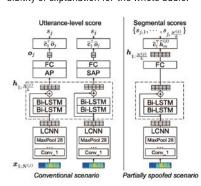


ZHANG, Lin

Enrolled in 2020, 3-year Ph.D. course Main supervisor: Prof. YAMAGISHI, Junichi

Automatic speaker verification (ASV) is vulnerable to manipulation through presentation attacks. To protect ASV from spoofing attacks, countermeasures (CMs) are proposed to distinguish bona fide and spoofed biometric data.

But all existing CMs only consider detecting attacks in the utterance-level, which is not suitable for realistic scenarios. My research aims to develop more elaborate countermeasures, which can detect spoof at the segmental-level or linguistic units such as words and phrases. That makes it easier to display and visualize which segment of the voice signal is the spoofed voice and thus improves the possibility of explanation for the whole audio.





TSUMURA, Takahiro

Enrolled in 2019, 5-year Ph.D. course Main supervisor: Prof. YAMADA, Seiji

Human-Agent Interaction is a research area that designs interactions between humans and anthropomorphic agents and robots. Especially, my research focuses on agent's social advancement through empathy between humans and agents.

One of the ways to improve anxiety and discomfort toward agents, which are becoming increasingly familiar to society, is to improve impressions of agents by focusing on empathy.

This research develops the conventional human-to-human relationship into a human-to-agent relationship. I investigate the influence of empathy between humans and agents based on various factors such as appearance, self-disclosure, and task. My research is expected to extend human empathy and help agents acquire empathy.

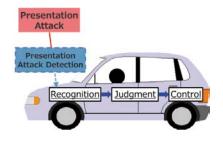




WANG, Jian

Enrolled in 2021, 3-year Ph.D. course Main supervisor: Prof. ECHIZEN, Isao

With the development of Autonomous Driving (AD), the debates on AD security are also rising. The attack on sensors, such as cameras, poses a major threat to the autonomous vehicles and may cause serious traffic accidents. Therefore, I am trying to understand how vulnerable the camera sensor is to an attack, what kind of attack may be, how much damage would be caused, etc. Also I am working on the research of the methods to prevent these attacks.



Message from an Alumnus



WAGA, Masaki Ph.D.

2018 - 2020 3-year Ph.D. course, Department of Informatics, SOKENDAI

Assistant Professor, Graduate School of Informatics, Kyoto University

He is working on quality assurance of cyber-physical systems using lightweight formal methods.

After finishing my master's program, I entered the Graduate University for Advanced Studies, SOKENDAI for the third year due to the transfer of my supervisor, Professor Ichiro Hasuo. In SOKENDAI, I studied the quality assurance of cyber-physical systems requiring high reliability, such as automobiles. In my research, I utilized mathematical methods such as logic and automata to improve reliability. Currently, I am an assistant professor at the Graduate School of Informatics, Kyoto University. I am continuing my research on improving the reliability of cyber-physical systems.

In the Department of Informatics at SOKENDAI, all students are hired as research assistants at the National Institute of Informatics (NII) except for MEXT scholarship students and working students. Moreover, there is a special research assistant program for outstanding students. The qualified students can receive a higher salary. These financial supports by employment, which are unfortunately not very common in Japanese universities, are very helpful for full-time students.

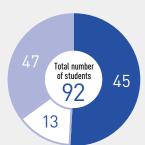
At SOKENDAI, there are a lot of opportunities to have a discussion with many other researchers. The Open

House of NII is one of such opportunities. The Open House is an annual event of NII to present the research to the public, including researchers in other fields, researchers in industry, and the general public. The students in this department have an opportunity to present their research at this event and discuss their research with various people. Such an opportunity is helpful in looking at our own research from other viewpoints.

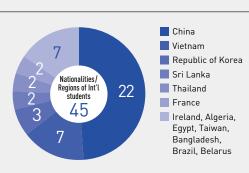
Another fruitful opportunity to broaden the scope is a discussion with various students, many of them are from abroad. There are many international students and internship students at SOKENDAI. We can broaden our research scope through discussion with them, which is, in my experience, quite helpful to the research. We can also improve our English skills and learn about different cultures through daily conversations with them.

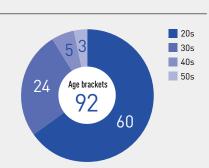
Overall, there are many opportunities to broaden the research perspectives as well as many other supports by SOKENDAI. I believe that broadening the research perspectives is highly helpful in deepening our research, and thus, the environment in SOKENDAI is very attractive.

Students Data









Degree Recipient Employment Organization Categories

Degree Recipients 228 128 Research Institutes Private Companies

Others

[Research Institutes]

Hosei Univ., Japan Advanced Institute of Science and Technology, Kwansei Gakuin Univ., Kyushu Univ., Kyoto Univ., Meiji Univ., Ministry of Defense, Ministry of Internal Affairs and Communications, Nara Institute of Science and Technology, National Institute of Informatics, National Institute of Advanced Industrial Science and Technology, National Institute of Information and Communications Technology, NHK Broadcasting Culture Research Institute, Tokyo Institute of Technology, Tsukuba Univ., The Univ. of Tokyo, Yamanashi Univ., Okinawa Institute of Science and Technology Graduate University, Ritsumeikan Univ., RIKEN, Waseda Univ., Bangkok Univ., CITEC, Ecole Centrale, Hanoi Univ. of Science and Technology, National Electronics and Computer Technology Center(NECTEC), Royal Institute of Technology(KTH), Ulsan National Institute of Science and Technology, Univ. of Dhaka, Univ. of Oxford, Univ. of Quebec at Montreal(UQAM), Vietnam National University

[Private Companies]

ACCESS CO.,LTD., Cornea Technologies Ltd., Cyber Agent, Inc., FAST ACCOUNTING Co., FUJITSU, Fujitsu Laboratories Ltd., G.TASTE Co.,Ltd., Government Information Technology Services, HCL JAPAN LTD., Hitachi Ltd., HUAWEI, IBM Japan, Indeed Inc., Institute for Creative Integration, Intage, KDDI Corp., KINTO Technologies Corporation, Metamedia Technology Co.,Ltd., Mitsubishi UFJ Research and Consulting Co.,Ltd., NEC Corporation, Nihon Unisys Ltd., Nintendo Co., Ltd., NTT Group, NTT East, Panasonic Corporation, Rrakuten Inc., Rakuten Group, Inc., SBI BITS Co, Ltd., SECOM Co., Ltd., Toshiba Memory Corporation, SMBC Nikko Securities Inc., Sony Interactive Entertainment, Toshiba Infrastructure Systems & Solutions Corporation, Total Access Communication PCL, Works Applications Co.,Ltd., Yazaki Corporation

Conference presentation award

- •APSIPA ASC 2022 Best Paper Award
- •The Japanese Society for Artificial Intelligence, The 35th JSAI Annual Conference Award
- •Graduation Thesis OPEN AWARD 2021, Award of Excellence
- 29th International Conference on Artificial Neural Networks (ICANN20), Springer & ENNS Best Paper Award
- •The Japanese Association of Sociolinguistic Sciences, the 20th (JASS 43) Research Conference Presentation Award
- •The Acoustical Society of Japan, 2020 Autumn Meeting Best Student Award
- •ILP 2019: 29th International Conference on Inductive Logic Programming,Best Student Paper Award •Semantic Web Challenge on Tabular Data to Knowledge Graph Matching,First prize
- •17th International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS 2019), Order Maler Award
- •Information Processing Society of Japan, Doctoral Theses Recommended by IPSJ
- •Information Processing Society of Japan, Best Paper Award of the 81st National Convention of IPSJ

etc.

Scholarship and Other Financial Supports

Scholarship Programs

Research Assistant (RA)

This program is a student employment system in which students work on a specific research topic under the guidance of an academic supervisor. NII will basically employ all applicants (excluding working students, government scholarship recipients and SOKENDAI Special Researcher). *Relevance to academic research is considered.

Approximate monthly income: Around ¥100,000.

SOKENDAI tuition exemption system

SOKENDAI has a tuition / admission fee exemption system for students who has financial difficulties but are proven to have outstanding academic performance.

Other scholarship program

Scholarship by private foundation

[Amount of provision]

70,000-100,000 yen/month

SOKENDAI Special Researcher

This program is designed to foster future leaders in academic research by appointing SOKENDAI students as special researchers and providing financial support to them. A special researcher with outstanding achievements will be offered a two-year research position at the parent institute* upon the completion of their doctoral program.

*Parent institute: The Inter-University Research Institute, where their program is

Scholarship

Fellowship (for living expenses)

190,000

(Amount of provision for AY2023)

Research grant up to

220,000

yen/year

Support for internship and int'l conference

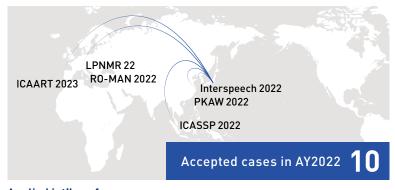
SOKENDAI Student Dispatch Program

SOKENDAI provide financial support for a short-term research opportunity abroad and/or a long-term collaborative research project in and outside Japan.



Financial aid program for SOKENDAI students to attend "Top Conference"

Informatics Program establishes a financial aid program to encourage students to participate in prominent international conferences (Top Conference).



Applied int'l conferences

- ICASSP 2022 (Singapore)
- · Interspeech 2022 (South Korea, Incheon) · IEEE GLOBECOM 2022 (Online)
- · LPNMR 2022 (Italy, Genoa)
- · RO-MAN 2022 (Italy, Naples)
- IEEE VTC 2022-Fall (Online)
- PKAW 2022 (China, Shanghai)
- ICAART 2023 (Portugal, Lisbon)

Accommodation information

Although the Program don't have dormitories, students can apply for public accommodation such as UR (Urban Renaissance) apartment or the Tokyo International Exchange Center, which is located in bay area of Tokyo. SOKENDAI also has a "Comprehensive Renters' Insurance" for Int'l students who wish to rent an apartment through an agency.

https://www.soken.ac.jp/en/campuslife/international/supports/

^{*}Student can apply through SOKENDAI after enrollment.

^{*}Application screening and interview will be conducted.

^{*}This shall not preclude the students from being offered a position with research institutes and private corporations after graduation.

Research / Campus Environment

A Research Environment with Cutting-edge Facilities, Located in the Heart of the City

Research Environment



Network

- Wireless / Wired networks are available at each
- Research resources are accesibble from outside of NII by using Virtual Private Network (VPN)
- Wireless network (Eduroam) at other university/ institutes in Japan or abroad are available by using NII account

Research Cloud

A high performance cloud system set up by NII for internal research uses.

Library

The library located on the 18th floor is open 24 hours a day. Books can be checked in and out at any time.

Available main online journals

ACM Digital Library (Association for Computing Machinery),

APS online (American Physical Society), IEL (IEEE, IEE),

MathSciNet (American Mathematical Society), Springer Link (Springer Nature), Science Direct (Elsevier B.V.), Wiley Online Library (John Wiley & Sons.)

Campus Environment



Lecture Room

The lecture room at NII is designed so that lectures at the Program have an intimate, one-to-one feel. Students can also attend lectures remotely.



Student Room

Student room with private desk is available for students. It is open for 24 hours a day.



Dining Hall

The dining hall is a bright, clean space where students can take their meals in comfortable surroundings.



Cafeteria

Provides light meals and refreshments; also serves as a venue for small informal parties organized by students.



Lounge

Located on the 14th and 18th floor, Tokyo Skytree can be seen from the lounge. Mixer events for students and researchers are held in this area.



International Seminar House for Advanced Studies

Students can use the International Seminar House for Advanced Studies in Karuizawa for study retreats.

Overview of Admissions

Informatics Program, SOKENDAI offers several enrollment options for international students who are seeking to obtain a Ph.D. degree.

General Admission

This program is for applicants residing in Japan. The entrance examination \bar{i} s composed of an on-site interview.

https://www.soken.ac.jp/en/admission/general_admission/

Special Admission for Applicants Residing Abroad

This program is for applicants residing abroad. The interview is administered via internet, thus applicants need not to come to Japan for the application and the exam. https://www.soken.ac.jp/en/admission/pvscholarship/scholarship/

Admission with Japanese Government Scholarship (MEXT scholarship)

Embassy Recommendation

Scholarship recipients are recruited and initially screened by a Japanese embassy. The students who passed the initial screen first enroll in a non-degree-seeking course of Informatics Program, SOKENDAI, and then apply to our graduate program through the General Admissions System.

https://www.soken.ac.jp/en/admission/mextscholarship/scholarship_jp

• University Recommendation

SOKENDAI will recommend for the MEXT Scholarship academically outstanding individuals who are considered to be in need of a scholarship. https://www.soken.ac.jp/en/admission/mextscholarship/university_recommendation/

• University Recommendation -PGP (Priority Graduate Program)-

This MEXT scholarship is offered for the special program "Interdisciplinary PhD Program in Information Science and Life Science for Leading Researchers on Data Science", which has been granted to SOKENDAI by MEXT.

This program aims at developing next-generation global researchers and highly skilled professionals who are capable of leading researches on data science as well as other scientific fields to which data science approaches can be applied. https://www.soken.ac.jp/en/admission/mextscholarship/university_recommendation_pgp/

Access

Our campus is conveniently situated in the center of Tokyo, near the Imperial Palace and within 2km distance from Tokyo station.





3 min. walk from Jimbocho Sta. or Takebashi Sta.

Int'l Affairs and Education Support Team, National Institute of Informatics

Address: 2-1-2 Hitotsubashi, Chiyoda-ku, Tokyo 101-8430

Email: daigakuin@nii.ac.jp

https://www.nii.ac.jp/graduate/en/

