INTRODUCTION

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

The National Institute of Informatics (NII) offers 3-year and 5-year PhD within
The Graduate University for Advanced Studies, SOKENDAI, in which it constitutes the Department of Informatics.

The Department of Informatics 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.

Department outline

What is SOKENDAI?
The Graduate University for Advanced Studies, SOKENDAI is a graduate university with its undergraduate programs that consist of departments housed in affiliated Inter-University Research Institutes and the School of Advanced Sciences 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 informatics, 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.
GETTING A PH.D. AT NII

The Department of Informatics has been installed in the National Institute of Informatics (NII). Each student belongs to the laboratory of a supervisor, and engages in research activities as a researcher of NII. For this purpose, NII actively employs students as a research assistant except students with full-time jobs and government-sponsored foreign students. Students study ever-progressing theories and technologies of informatics, while they receive research advice from their supervisors and advisors, then make presentations at top level international conferences and write papers for international journals, and finally should complete excellent and original PhD work at NII. It is the mission of the Department of Informatics that the researchers of the educators and foster world top level researchers at NII.

The Department of Informatics 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.

1. Top-Level Research Environment

Students of the Department of Informatics 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 closes personal connections. A full-scale though 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 Research. Additionally, 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.

3. Many graduates find work as researchers both in Japan and abroad

Many degree recipients of the Department of Informatics 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 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 for this than the atmosphere provided by NII.

Getting a Ph.D. at NII

Vice Chair, Department of Informatics

YAMADA, Seiji

The department of Informatics has been installed in the National Institute of Informatics (NII). Each student belongs to the laboratory of a supervisor, and engages in research activities as a researcher of NII. For this purpose, NII actively employs students as a research assistant except students with full-time jobs and government-sponsored foreign students. Students study ever-progressing theories and technologies of informatics, while they receive research advice from their supervisors and advisors, then make presentations at top level international conferences and write papers for international journals, and finally should complete excellent and original PhD work at NII. It is the mission of the Department of Informatics that the researchers of the educators and foster world top level researchers at NII.

Enriched global research environment in NII

Vice Chair, Department of Informatics

YAMADA, Seiji

The Department of Informatics is based on the National Institute of Informatics, which has international exchange programs with about 100 universities and institutions in the world. Visited by many students and researchers from foreign countries every year, NII conducts collaborative researches in a full spectrum of informatics. In our department, more than half of the students are from foreign countries, and a large part of the curriculums and research supervisions are provided in English. We also have various kinds of scholarship programs, as well as support for internships abroad. Students are encouraged to present their research results in high level international conferences. By offering an enriched cross-cultural environment, we aim to have our students trained with global perspectives and visions in building their extensive knowledge and high expertise in the field of informatics.

Requirements for Ph.D. Degree

The following schedule for the five-year and three-year Ph.D. course have been set by the Department.

PhD Course

- Five-year Ph.D. Course
- Three-year Ph.D. Course

- Second Year
- Administration
- Intermediate Evaluation
- Dissertation Progress Report
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Admission
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Interim Presentation 1
- Interim Presentation 2
- Interim Presentation 3
- Interim Presentation 4
- Interim Presentation 5

- Third Year
- Administration
- Intermediate Evaluation
- Dissertation Progress Report
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Interim Presentation 1
- Interim Presentation 2
- Interim Presentation 3
- Interim Presentation 4
- Interim Presentation 5

- Fourth Year
- Administration
- Intermediate Evaluation
- Dissertation Progress Report
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Interim Presentation 1
- Interim Presentation 2
- Interim Presentation 3
- Interim Presentation 4
- Interim Presentation 5

- Fifth Year
- Administration
- Intermediate Evaluation
- Dissertation Progress Report
- Second term
- 22 months
- Admission
- 12 months
- Administration
- Interim Presentation 1
- Interim Presentation 2
- Interim Presentation 3
- Interim Presentation 4
- Interim Presentation 5

- Sixth Year
- Administration
- Intermediate Evaluation
- Dissertation Progress Report
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Interim Presentation 1
- Interim Presentation 2
- Interim Presentation 3
- Interim Presentation 4
- Interim Presentation 5

- Seventh Year
- Administration
- Intermediate Evaluation
- Dissertation Progress Report
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Interim Presentation 1
- Interim Presentation 2
- Interim Presentation 3
- Interim Presentation 4
- Interim Presentation 5

- Eighth Year
- Administration
- Intermediate Evaluation
- Dissertation Progress Report
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Interim Presentation 1
- Interim Presentation 2
- Interim Presentation 3
- Interim Presentation 4
- Interim Presentation 5

- Ninth Year
- Administration
- Intermediate Evaluation
- Dissertation Progress Report
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Interim Presentation 1
- Interim Presentation 2
- Interim Presentation 3
- Interim Presentation 4
- Interim Presentation 5

- Tenth Year
- Administration
- Intermediate Evaluation
- Dissertation Progress Report
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Second term
- 22 months
- Admission
- 12 months
- Admission
- Interim Presentation 1
- Interim Presentation 2
- Interim Presentation 3
- Interim Presentation 4
- Interim Presentation 5

Course credit 40

Course credit 20

Course credit 10
Research Field and Advisors at the Dept.

Research Keywords and Major Research Papers Titles

**Foundations of Informatics**

**Developing Mathematical Theories Underpinning All of Informatics**

- Foundations of Informatics concerns theoretical understandings of informatics. In addition to their intrinsic importance, basic theories in informatics serve as foundations for all application areas, including networks, software, artificial intelligence, and information technology. Special emphasis is placed on mathematical theories about computer programs, data structures and algorithms, computational models, natural language, quantum computation, and communication, and biological data processing.

**Keywords**

- Discrete Math, Graph Theory, Algorithm, Theoretical Development, Computer Science

**Papers**

- Maximizing Time-Decaying Influence in Social Networks
- Coloring 3-Colorable Graphs with Less than \( n^{1/5} \) Colors

**Fujii, Kaito**

- Assistant Professor

**Kawarabayashi, Ken-ichi**

- Professor

**Nemoto, Ken**

- Professor

**Keywords**

- Quantum Information and Computation, Quantum Optics, Theoretical Physics

**Papers**

- Fault-Tolerant High Level Quantum Circuits: Form, Computation and Description
- High-fidelity spin measurement on the nitrogen-vacancy center

**Tatsuta, Masahiro**

- Professor

**Hirahara, Shuichi**

- Assistant Professor

**Keywords**

- Computational Complexity Theory, P-versus NP Problem, Minimum Circuit Size Problem, Kneser-type Inequality, Pseudorandomness

**Papers**

- Non-Black-Box Worst-Case to Average-Case Reductions within \( P \)
- \( \text{NP} \)- hardness of Minimum Circuit Size Problem for \( \text{NP-AND-MOD} \) Circuits

**Tatsuta, Masahiro**

- Professor

**Igarashi, Ayumi**

- Assistant Professor

**Keywords**

- Algorithmic game theory, Fair division, Multi-Agent System

**Papers**

- Almost Envy-free Allocations with Connected Bundles
- Fair Allocation of Indivisible Goods and Chores

**Uno, Takeaki**

- Professor

**Yokoi, Yu**

- Assistant Professor

**Keywords**

- Algorithms, Computation, Optimization, Data Mining, Data Engineering

**Papers**

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

**Kishida, Masako**

- Associate Professor

**Keywords**

- Control Theory, Optimization, Uncertain Systems, Networked Systems

**Papers**

- Event-triggered control for discrete-time nonlinear systems using state-dependent Riccati equation
- Do problems meting organizations for uncertain matrices by structured singular values

**Matsumoto, Keiji**

- Associate Professor

**Keywords**

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

**Papers**

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

**Yoshida, Yuichi**

- Associate Professor

**Keywords**

- Algorithms, Theoretical Computer Science, Combinatorial Optimization

**Papers**

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

**URUSHIDANI, Shigeki**

- Professor

**Keywords**

- Network Architecture, Network Service Systems

**Papers**

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

**Information Infrastructure Science**

**The Construction and Enhancement of Information Infrastructure**

**Aida, Kento**

- Professor

**Keywords**

- Parallel and Distributed Computing, Grid Computing, Cloud Computing, Formal Verification, Input/Output System Analysis

**Papers**

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

**Kaneko, Masahiro**

- Professor

**Keywords**

- Computer Architecture, Microarchitecture, Digital Circuit

**Papers**

- Minimal Multimplified Multibanked Register File for Area and Energy Efficiency
- Application of Checking Scheme That Enables Dynamic Time Borrowing

**Abe, Shunji**

- Associate Professor

**Keywords**

- Information Networks, Network Performance Analysis, QoS Control

**Papers**

- Maximizing Available Bandwidth in Mobile Networks by Correlation Coefficients
- New Directions for a Japanese Academic Backbone Network

**Ishikawa, Yutaka**

- Professor

**Keywords**

- System Software, Operating System, Communication and Networking, Parallel and Distributed Processing

**Papers**

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

**Fukuda, Kensuke**

- Associate Professor

**Keywords**

- Internet Protocol, Traffic Measurement, Analysis and Modeling, Scalable Internet, Small-World Networks

**Papers**

- Minimally costly of network events in log data
- New Evaluation of Darkinet Traffic Taxonomy

**Ji, Yusheng**

- Professor

**Keywords**

- Network Resource Management, Mobile Computing

**Papers**

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

**Kaneko, Masahiro**

- Associate Professor

**Keywords**


**Papers**

- Distributed Resource Allocation with Local CSI Overhearing and Scheduling Prediction for OFDMA Heterogeneous Network
- Throughput Analysis of CSMA with Imperfect Collision Detection in Full-Duplex-Enabled WLAN

**Takekura, Hiroki**

- Professor

**Keywords**

- Cyber Security, High Performance Network, Secure Networking, Data Mining

**Papers**

- UNO: A Specialized Incident Notification System for Incident Handling
- Construction of Secure Internet Networks with Communication Classifying System

**Kobuchi, Michihide**

- Associate Professor

**Keywords**


**Papers**

- AC: A Case for Random Topology Redundancies for IPC Interconnects
- High-Bandwidth Low-Latency Approximate Interconnection Networks

**Kurimoto, Takashi**

- Associate Professor

**Keywords**

- Network Protocol, Network Node Architecture

**Papers**

- WINETS: A Low-Latency and High-Bandwidth Backbone Network for SNUM/IPV Era
- Multi-campus ICT equipment virtualization architecture for cloud and MPFI integrated service
Research Field and Advisors at the Dept.

Research Keywords and Major Research Papers Titles

**Software Science**

Software: Enabling Technologies for IT

- **Keywords**: Human Interface, Man-Machine Interface, Digital Signal Processing
- **Papers**: Time-of-arrival-based Smartphone Localization Using Visible Light Communication

**Kitamoto, Asanobu**

**Keywords**: Data-driven Science, Digital Humanities, Earth Environmental Informatics, Image Processing, Digital Archiving, Open Science
- **Papers**: Differential Reading by Image-based Change Detection and Prospects for Human-Machine Collaboration at Differential Transcription

**SATOH, Ichiro**

**Keywords**: Cloud Computing, Ubiquitous Computing, Middleware, DS, Distributed Computing
- **Papers**: A Component Framework for Adapting to Elastic Resources in Clouds

**Takasu, Atsuhito**

**Keywords**: Data Engineering, Sensor Data Analysis, Text Mining
- **Papers**: Neural Personalized Embedding for Collaborative Filtering

**Hashiguchi, Shunsuke**

**Keywords**: Logic, Automata, Category Theory, Formal Methods, Cyber-Physical System, Optimization, Machine Learning
- **Papers**: Two-Layered Fusion of Hybrid Systems Guided by Meta-Crane Tree Search

**Aoki, Ichiro**

**Keywords**: Autonomous Driving, Cyber-Physical Systems, Real-Time Systems, Embedded Systems, Mobile Robots, Internet of Things
- **Papers**: Dynamic interactions and self-driving vehicles

**Multimedia Information Science**

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, putting the basic science of media processing in general, such as pattern recognition and signal processing, and media utility for interactions between people and information systems or among people.

**Keywords**: Image Sensing, Image Restoration / Reconstruction, Image / Video Coding, Visual Communications
- **Papers**: Efficient Reconstruction of All-in-Focus Images Through Stacked Patches from Multi-Focus Images for Dense Light Field Synthesis and Rendering

**Yamagishi, Junichi**

**Keywords**: Speech Information Processing, Machine Learning, Speech-Based Human-Machine Interaction, Speech Database, Biometrics, Media Forensics
- **Papers**: Wasserstein GAN and Waveforms Loss-based Acoustic Model Training for Multi-speaker, Text-to-Speech Synthesis Systems Using a WaveNet Neural Vocoder

**Shinji, Katsuhiko**

**Keywords**: Computational Geometry, Shape and Light Source Estimation
- **Papers**: Robust removal of fixed pattern noise on multi-focus images

**Goto, Hironori**

**Keywords**: Computer Graphics, Physics Simulation, Artificial Intelligence, Pattern Recognition, Video Content Analysis
- **Papers**: un-supervised estimation of video continuity model from large-scale video archives and its application to shot boundary detection

**Kodama, Kazuya**

**Keywords**: Image Sharing, Knowledge Base, Reading
- **Papers**: Reading Skill: Text to Diagnose Basic Language Skills in Comparison to Machines

**Sato, Kiyota**

**Keywords**: Knowledge Sharing, Knowledge Base, Reading
- **Papers**: Anaphoric Coreference Resolution for Japanese Text

**Kodama, Kazuya**

**Keywords**: Image Sharing, Knowledge Base, Reading
- **Papers**: Anaphoric Coreference Resolution for Japanese Text
Research Field and Advisors at the Dept.

Research Keywords and Major Research Papers Titles

### Intelligent Systems Science

**Science**

AI Technology Enhancing Human Intelligent Tasks

Artificial Intelligence (AI) is an emergent technology which enhances human intelligence tasks by intelligent computer systems. The intelligent systems science course offers studies on intelligent systems to give students a full understanding of various advanced research topics in the field and aims to foster human resources to create core technology on intelligent systems.

**Keywords**

- Natural Language Interface
- Natural Language Understanding
- Knowledge Acquisition
- Document Analysis
- Semantic Parsing
- Dialogue Systems
- Language-Conditioned Feature Pyramids for Visual
- Selected Tasks
- Constructing a Multi-hop QA Dataset for Comprehensive Evaluation of Reasoning Tasks

**Advisor**

**Professor**

AIZAWA, Akiko

**Keywords**

- Natural Language Interface
- Natural Language Understanding
- Knowledge Acquisition
- Document Analysis
- Semantic Parsing
- Dialogue Systems
- Language-Conditioned Feature Pyramids for Visual
- Selected Tasks
- Constructing a Multi-hop QA Dataset for Comprehensive Evaluation of Reasoning Tasks

**Professor**

BONO, Mayumi

**Keywords**

- Sociolinguistics
- Conversational Informatics
- Utterance
- Embedded Action
- Sign Language
- Conversational Analysis
- Social Interaction

**Advisor**

**Associate Professor**

ICHIJIMA, Yuta

**Keywords**

- Machine Learning
- Data Mining
- Semantic Web
- Machine Learning
- Data Mining
- Semantic Web
- Model-based Causality for Intrinsically Motivated
- Reinforcement Learning
- Generalized Translation-embedded Embedding of Knowledge Graph

**Advisor**

**Associate Professor**

INDOUE, Katsumi

**Keywords**

- Artificial Intelligence
- Knowledge Representation and Reasoning
- Machine Learning
- Logic Programming
- Constraint Programming
- Multi-Agent Systems
- Linear Algebraic Characterization of Logic Programs
- Learning from interpretation translation

**Professor**

PRENDINGER, Helmut

**Keywords**

- Artificial Intelligence
- Human-Machine Interaction
- Unmanned Aircraft Systems
- Traffic Management
- Holographic Segmentation using Semantic
- Segmentation using a Model Compression Technique
- Automated Space for Conducting Controlled Driver Tutoring Studies Based on a Multi-sensor Networked 3D Virtual Environment and the Scenario Markup Language

**Professor**

KANTOREK, Atsushi

**Keywords**

- Knowledge Representation
- Multi-Agent Systems
- Machine Learning
- Computational Logic
- Legal Reasoning
- Obligation as Optimal Deal Satisfaction
- Mediating Last-first Attempted Crime in Criminal Law

**Professor**

SATOH, Ken

**Keywords**

- Reasoning
- Knowledge Representation
- Multi-Agent Systems
- Machine Learning
- Computational Logic
- Legal Reasoning
- Obligation as Optimal Deal Satisfaction
- Mediating Last-first Attempted Crime in Criminal Law

**Professor**

TAKEDA, Hideaki

**Keywords**

- Semantic Web
- Knowledge Sharing
- Community Support
- Situated Design Theory
- Browser-like Interface
- Understanding massive artistic cooperation: the case of Nico
- Nico Project
- The power of corporate culture in the global ownership network
- Structure of global buyer-supplier networks and its implications for conflict minerals regulations

**Professor**

**Associate Professor**

SUGIYAMA, Mahito

**Keywords**

- Machine Learning
- Data Mining
- Statistics
- Knowledge Discovery
- Data Mining
- Social Network Analysis
- Data Mining on Statistical Manifest
- Legends Decomposition for Tensor

**Professor**

**Associate Professor**

SUGAWARA, Saku

**Keywords**

- Natural Language Processing
- Computational Linguistics
- Natural Language Understanding
- Machine Reading Comprehension
- Deep Neural Networks
- Language Modeling
- Language Modeling
- Pre-trained Models for Machine Reading Comprehension
- Pre-trained Models for Machine Reading Comprehension

**Professor**

**Associate Professor**

YAMADA, Seji

**Keywords**

- Human-Agent Interaction
- Human-Robot Interaction
- Response Time When Interpreting Artificial Subtle Expressions
- Simultaneous Speaker Speech Sounds
- Expressing Emotions Through Color, Sound, and Vibration
- with an Appearance-Constrained Social Robot

**Professor**

**Associate Professor**

Annual Events at the Dept.

### 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. This event draws around 1,000 people annually. At this event, students from the Department of Informatics 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 - Final Presentation by Graduates**

A special ceremony for students graduating with a Ph.D. degree in Informatics from SOHDENDAI will be held at the National Institute of Informatics. Each graduate will be presented individually with a medal to commemorate their achievement. Final presentation will be held afterward and this will be the final presentation as a compilation of their work.

**Visiting Professors**

- **HU, Zhiqiang**
  - Shenzhen Institute of Technology
  - Visiting Professor

- **ICHIKAWA, Fuyuki**
  - JST, JSPS
  - Visiting Associate Professor

- **SATOH Shin’ichi**
  - National Institute of Informatics
  - Visiting Professor

- **HOULE, Michael E.**
  - National Institute of Informatics
  - Visiting Professor

- **PLANAS, Emmanuel**
  - National Institute of Informatics
  - Visiting Professor
Students’ Research

MASUOKA, Yukihiro
Enrolled in 2018, 5-year Ph.D. course
Main supervisor: Prof. TATSUMA, Masahiro
I study basic theory for software verification. Software verification is to mathematically prove that programs satisfy requirements. Especially, I am interested in verification with separation logic and cyclic proofs both of which come from mathematical logic, and I study mathematical properties of them. Actually, basic properties of logic are not known, so I am eager to study it.

DINH, Thi Ha Ly
Enrolled in 2017, 5-year Ph.D. course
Main supervisor: Assoc. Prof. HAYASHI, Kenji
Given the ever-increasing number of wireless subscribers and the expansion of IoT communications, the volume of mobile traffic data is expected to grow exponentially. However, radio spectrum scarcity poses a major challenge for the design of future wireless communication systems, required to support such a deluge of data while guaranteeing excellent performances.

ZHANG, Lin
Enrolled in 2020, 5-year Ph.D. course
Main supervisor: Prof. TACHIKAWA, Jun
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.

WAGA, Masaki
Ph.D.
2018 - 2020
USA, 1st Ph.D. course, Department of Informatics, SOKENDAI
Assistant Professor, Graduate School of Informatics, Kyoto University
I was working on a high quality assurance of cyber-physical systems using lightweight formal methods.

PHUA, Yin Jun
Enrolled in 2018, 5-year Ph.D course
Main supervisor: Prof. INOUE, Katsumi
Bidirectional transformations (BXs) serve to maintain consistency between two representations by composing simpler programs. Currently I am investigating the approach of lightweight formal methods.

NGUYEN, Trong Bach
Enrolled in 2018, 5-year Ph.D course
Main supervisor: Assoc. Prof. KANEKO, Megumi
I am working on quality assurance of cyber-physical systems.

GAN, Wenbin
Enrolled in 2019, 5-year Ph.D course
Main supervisor: Prof. SUW, Rui
I am studying the synthesis of bidirectional programs from given specifications that can be a set of input/output examples or refinement types.

NGUYEN, Thu Huong
Enrolled in 2020, 5-year Ph.D course
Main supervisor: Prof. SUW, Rui
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/output examples or refinement types.

Students’ Data

- Total number of students: 53
- Japanese students: 22
- International students: 19

Employment Place of Degree Recipients as of April 2021

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>21</td>
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<td>Vietnam</td>
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<td>4</td>
</tr>
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<td>Finland, Malaysia, USA</td>
<td>4</td>
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<tr>
<td>Singapore, Republic of Korea</td>
<td>4</td>
</tr>
</tbody>
</table>

Message from an Alumnus

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 supervision 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 making our own research from other viewpoints.

Another fruitful opportunity to broaden the scope is a discussion with various students, many of them 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.

Conference presentation award

- 26th International Conference on Artificial Neural Networks (ICANN20)
- 11th International conference on Inductive Logic Programming, Best Student Paper Award
- 5th International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS 2019), Best Student Paper Award
- 6th International Conference on Graph Matching, First Prize
- 6th International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS 2019), Best Student Paper Award
- Information Processing Society of Japan, Doctoral Theses Recommended by IPSJ
- Information Processing Society of Japan, Best Paper Award of the 3rd National Conferences of IPSJ
- etc.
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 new students (excluding working students, government scholarship recipients, and SOKENDAI Special Researchers). *Reference to academic research is considered.

<table>
<thead>
<tr>
<th>Employment status</th>
<th>54 - 55 students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly pay</td>
<td>1,100 yen (average 1,200 yen)</td>
</tr>
<tr>
<td>for students enrolled in the 1-2 year of five-year course</td>
<td></td>
</tr>
</tbody>
</table>

*SOKENDAI tuition exemption system

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

Other scholarship program

Scholarship by private foundation

<table>
<thead>
<tr>
<th>Amount of provision</th>
<th>Approx. 70,000 - 100,000 yen/month</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Student can apply through SOKENDAI after enrollment.</td>
<td></td>
</tr>
</tbody>
</table>

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 course.

<table>
<thead>
<tr>
<th>Scholarship</th>
<th>Fellowship (for living expenses)</th>
<th>Research grant up to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>190,000 yen/month</td>
<td>220,000 yen/year</td>
</tr>
<tr>
<td>*Application screening and interview will be conducted.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*This shall not preclude the students from being offered a position with research institutions and private corporations after graduation.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Support for internship and int’l conference

SOKENDAI Student Dispatch Program

SOKENDAI provides 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”

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

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

Research Environment

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

Network

- Wireless/Wired networks are available at each floor.
- Research resources are accessible from outside of NII by using Virtual Private Network (VPN)
- Wireless network (Eduroam) at other universities

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

Research Cloud

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

Library

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Available main online journals

- ACM Digital Library (Association for Computing Machinery)
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Overview of Admissions

Department of Informatics, 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 is composed of an on-site interview.

• **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.

• **Admission with Japanese Government Scholarship (MEXT scholarship)**
  MEXT scholarship Priority Graduate Program (MEXT PGP)
  This scholarship is offered for the special program “Interdisciplinary PhD Program on AI and Data Science for Global Leaders”, which has been granted to SOKENDAI by Ministry of Education, Culture, Sports, Science and Technology (MEXT).
  The program aims at developing next-generation global researchers and highly skilled professionals who should lead researches on Artificial Intelligence (AI) and Data Science (DS) as well as many scientific fields that apply AI and DS.

• **Embassy recommendation process for MEXT scholarship**
  Scholarship recipients are recruited and initially screened by a Japanese embassy. The students who passed the initial screen first enroll in a nondegree program of SOKENDAI Department of Informatics, and then apply to our graduate program through the General Admissions System.

Access

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

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/](https://www.nii.ac.jp/graduate/en/)