NII

Inter-University Research Institute Corporation
Research Organization of Information and Systems

2012

National Institute of Informatics

Contents

Introduction	1
Mission and Strategies	2
Scope of the Research	4
Principles of Informatics Research Division	4
Information Systems Architecture Science Research Division	6
Digital Content and Media Sciences Research Division	8
Information and Society Research Division	10
Grand Challenge, Projects	12
Funding Program for World-Leading Innovating R&D on Science and Technology (FIRST Program)	13
Research Center, Organization for Management and Outside Collaboration on R&D	14
Research Cooperation	15
Intellectual Properties	16
Education	17
TopSE and edubase : Education Services for IT specialists	17
Graduate Education Activities	18
NII Library	20
International Exchange	21
Cyber Science Infrastructure (CSI)	25
Consolidation of Cyber Science Infrastructure (CSI)	25
・Science Information Network (SINET4)	26
・Establishment of Authentication Infrastructure	28
・Construction of the authentication infrastructure and network infrastructure for the High-Performance Computing Infrastructure (HPCI)	29
Academic Information Infrastructure	30
Establishment of Next-Generation Academic Information Infrastructure	30
Support for Linkage between Institutional Repositories	31
GeNii (NII Scholarly and Academic Information Portal)	32
Catalog Information Service, NII Repository of Electric Resources (NII-REO)	34
International Scholarly Communication Initiative (SPARC Japan), Education and Training Programs	35
Dissemination of Research Results	36
Organization	38
Organization / Staff / Budget	38
History	41
Facilities, Location	42
Contact info for inquiries	44

Greeting from the Director General

Needless to say, academic research organizations are now under increased pressure to clarify their missions and roles, plan and implement unique activities, and effectively demonstrate their various successes.

National Institute of Informatics (NII) has designated the following missions and roles: To create future value (create scholarship) as Japan's sole comprehensive academic research institute in the field of informatics; to attain the status of a national center for informatics research activities; and to spearhead and develop service operations related to the academic information infrastructure (academic networks and contents) — a task vital to the research and education activities of today's academic community overall. Through the above efforts, the NII aims to realize the effective contributions internationally as well as to domestic society.

The missions that the National Institute of Informatics (NII) has to complete and the roles it has to play are particularly significant now. It is required to create and develop new information science theories and methodologies for solving social issues in energy, environment, disaster mitigation fields etc. and deploy them throughout society. Global Research Center for Quantum Information Science, Center for Global Research in Advanced Software Science and Engineering, Research Center for Cyber Physical Systems, and other institutions set up in the last few years are practical examples. To increase Japan' s international competitiveness in academic education and research, it is necessary to continuously, seamlessly, and efficiently develop a new leading-edge academic information infrastructure for intelligently sharing, expanding, and circulating research and educational resources and findings. SINET4, launched in April 2011, and the various academic cloud services used on it are part of the tangible results of these actions.

NII intends to focus its efforts on fulfilling these missions by further strengthening its research structure and by making the institution more accessible.

We look forward to the continued understanding and support of all related parties.

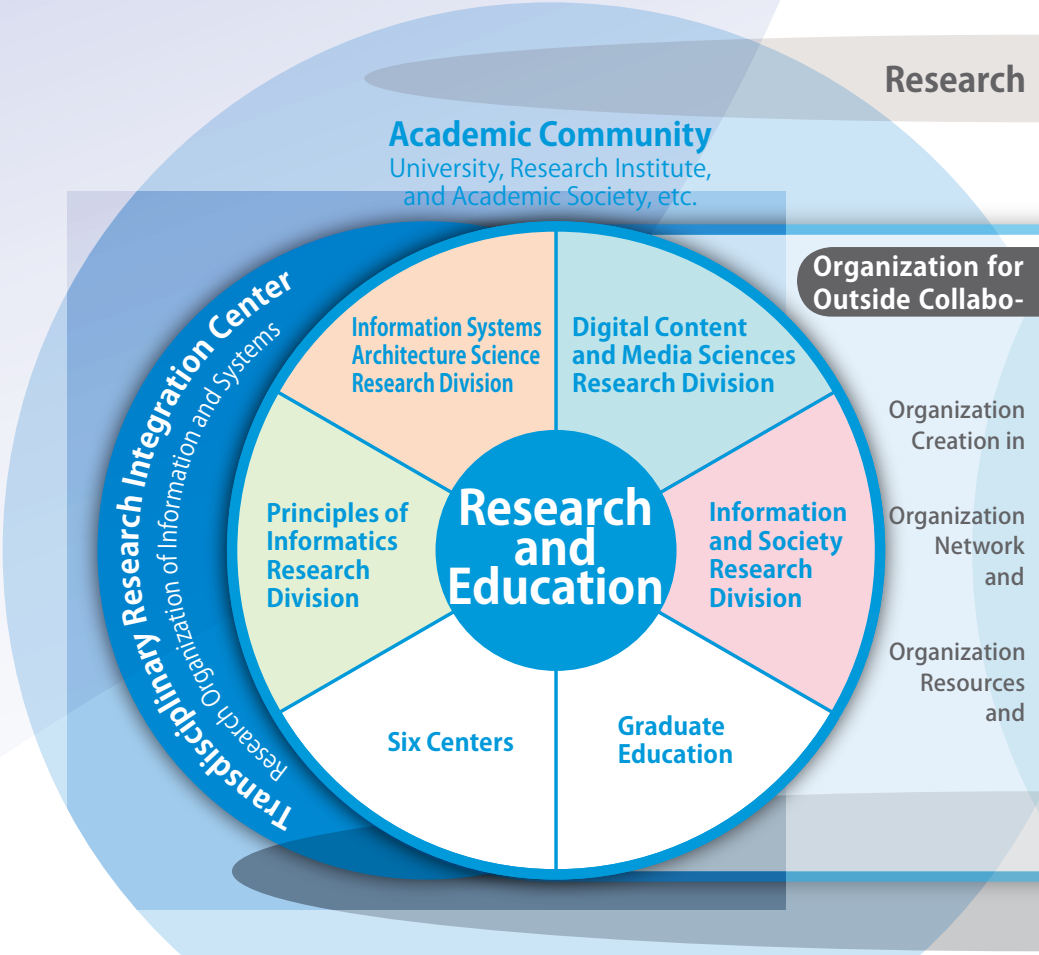
Masao Sakauchi
Director General, National Institute of Informatics
April 2012

Inter-University Research Institutes

Inter-University Research Institutes are unique research organizations in Japan that seek to promote joint research across disciplines among universities. The institutes offer large-scale and cutting-edge facilities, large volumes of academic data, and valuable materials, which a single university would find it difficult to create and maintain, making them available free of charge to researchers in Japan as institutes shared by universities in different disciplines.

Future Value Creation through Informati

As Japan's only general academic research institution seeking to create future value development activities in information-related fields, including networking, software, university research institute, NII promotes the creation of a state-of-the-art academic- the broader academic community, with a focus on partnerships and other joint ef-



Advancing integrated research and education in the field of informatics

Informatics is a new academic discipline based not just only on computer science and information technology, but on the human, social, and life sciences. NII advances informatics research with the goals of creating future value; furthering social and public contributions; promoting interdisciplinary approaches to information processing; partnerships among industry, government, academic, and civilian organizations; and international research activities and operations. NII has established four research divisions, six research centers, the Organization for Management and Outside Collaboration on R&D.

Reserch

Seeking to establish a new academic discipline through the promotion and systemization of a wide range of informatics research ranging from natural science to human and social sciences, NII aims to create future value through new theories, methodologies, and application deployment, thereby contributing to the development of informatics.

Partnerships between industry, academic and government sectors

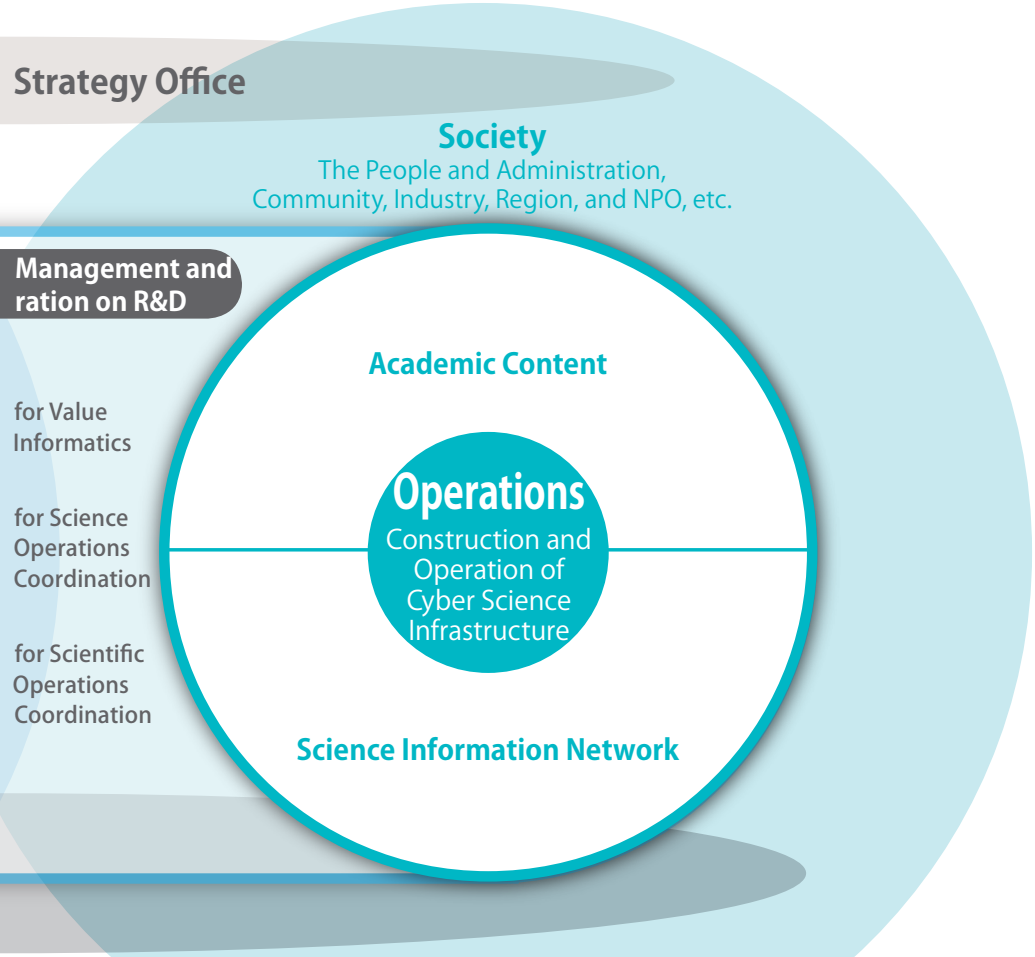
NII encourages close partnerships between universities, public research institutions and private institutions to conduct project-based joint studies, as well as human resource development and to promote the utilization of its research results in society.

Interdisciplinary information processing

To further the development of new domains through synergistic efforts between cross-functional interdisciplinary research and diverse academic disciplines, NII undertakes cross-functional transdisciplinary integration research at the Transdisciplinary Research Integration Center of the Research Organization of Information and Systems.

cs by Advancing Research and Operations in Tandem

in the new discipline of informatics, National Institute of Informatics (NII) seeks to advance integrated research and and content. These activities range from theoretical and methodological work through applications. As an inter- information infrastructure (the Cyber Science Infrastructure, or CSI) that is essential to research and education within forts with universities and research institutions throughout Japan, as well as industries.



Promoting the Cyber Science Infrastructure (CSI)

NII advances the formation and operation of the CSI, a state-of-the-art academic information infrastructure. Through these efforts, the entire research organization comprising the Organization for Scientific Network Operations and Coordination and the Organization for Scientific Resources Operations and Coordination, that which plan and manage partnerships and cooperation with universities and other institutions throughout Japan; the Cyber Science Infrastructure development Department, that which handles development and operation of information systems; and the research centers that promote researcher participation and incorporation of the results of research contributes to the academic community.

International exchange

NII strives to further the international contribution of informatics through the active promotion of international exchanges between researchers and students and an approach focused on the formation of an informatics research center through international collaboration, in addition to publishing its research results internationally.

Social contribution

NII seeks to achieve harmony between society, culture, and social systems in addition to creating platforms and portals that make effective use of content to disseminate and enliven social and public activities in the field of academic, cultural, education, publishing, environmental, regional, and NPO activities.

Graduate education and human resource development

In the Ph.D. program for informatics in the School of Multidisciplinary Sciences at the Graduate University for Advanced Studies, NII aims to nurture world-class researchers in the field of informatics and establish a base for the development of engineers with the skills to link the industry with academics to develop high-level human resources.

Principles of Informatics Research Division

**Seek to discover new principles and theories in informatics,
as well as the development of technology and new domains that will support the future society.**

Working to Unravel the Secrets of Biological Activity Through Inference

Artificial Intelligence makes hypotheses, tests them, and confirms them

Katsumi Inoue

The image of computers that one may have is one of being good at performing calculations in accordance with defined rules, but being unable to handle things which do not follow rigidly predetermined lines. I am researching mechanisms which transcend that conventional wisdom, that is, systems where computers infer, in the form of hypotheses, the rules necessary to reach a conclusion. That approach is currently being used in the field of systems biology.

Systems biology is concerned with an integrated understanding of the different interrelated elements that make up life activities, which it treats as a single system. Biology has until now focused on separating individual structures and parts, and explaining what they do, and this is still the primary approach used in bio research. The goal of systems biology, on the other hand, is exploring the relationships between these separate components, which are then put back together again into a cohesive whole.

For example, in a cell, signals are transmitted to trigger metabolism such as respiration, or other changes, or to restrain some reaction. It therefore controls genetic expression and suppression. These functions operate in a network of many different elements that are intricately entangled with one another. In addition, the structure is so complicated and multi-tiered that it is possible for one element to be involved in more than one network, and for there to be interactions between networks.

Systems biology creates a model of the interactions between elements in a living being as a single system and uses computer-aided simulation to verify the model. Nowadays, the functions of genes are increasingly being elucidated, and massive data are being accumulated. A computer is necessary to handle these data. Meanwhile, numerous missing links have yet to be made clear in order to understand the system as a whole in a comprehensive manner. This explains why it is important to draw inferences and discover hypotheses through the use of computers. For this purpose, an inference machine for discovering hypotheses called SOLAR is being developed.

I hope that it will lead to the discovery of hypotheses that are still unknown but will be useful to humans in the future. To reach this goal, it is also necessary to ensure that the system will be widely used. When talking with biological researchers, I get the feeling that the importance of systems biology has not been fully recognized yet, although they are aware of the necessity of processing enormous amounts of data. In systems biology, where a good deal of data are processed, a hypothesis discovery system could serve as an effective tool for discovering hidden mechanisms. If there are more opportunities to apply it, some positive results could be produced.

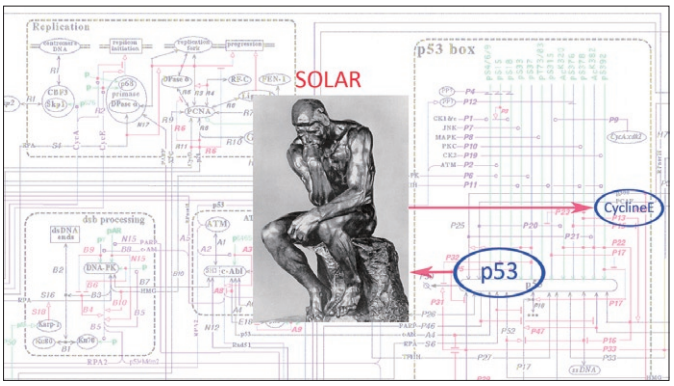


Figure: The inference system SOLAR discovers that DNA synthesis can be stopped by suppressing cyclin E, which is activated by the p53 gene in the genetic network (conceptual image)

Current Research Topics of Reseach Staff of NII

■Mathematical Informatics

Takeaki Uno	Efficient and practical fast algorithms for solving large scale problems arising from data mining and genome sciences / Theory of Complexity on Discrete algorithms and enumeration algorithms / Practical efficient computational models and algorithms for industrial engineering such as scheduling, logistics, and vehicle routing problems
Ken-ichi Kawarabayashi	Graph coloring problems in discrete math / Structural graph theory and its applications to algorithms / Network flow and disjoint paths problem
Kunihiko Sadakane	Succinct data structures for efficient storage and search of data / Data structures for fast string processing / Graph exploration algorithms, random walks
Ken Hayami	Numerical Analysis, Numerical Linear Algebra / Development and analysis of iterative methods for large systems of linear equations, least squares problems.
Yuichi Yoshida	Property testing / sublinear time algorithm / constraint satisfaction problem / approximation algorithm

■Mathematical Logic

Makoto Kanazawa	Lambda calculus and formal grammar / Logical semantics of natural language
Makoto Tatsuta	Theory of programs / Type theory / Constructive logic

■Quantum Information

Shoko Utsunomiya	Quantum simulation using optical semiconductors / Quantum solid state physics in optical semiconductors
Kae Nemoto	Quantum information/computation / Quantum optics / Theoretical physics
Keiji Matsumoto	Quantum information and computation
Yoshihisa Yamamoto	Photonic quantum information systems / Electronic quantum simulation systems
Tim Byrnes	Quantum Information / Quantum Computation / Solid State Physics

In search of the ultimate form of quantum computing

A unique way of performing computations

Shoko Utsunomiya

Our research may be defined as an interface between information science and physics. Waves have an interference effect. Overlapping waves strengthen or weaken each other. Interference also exists in the world of quantum mechanics. With this effect as a basic principle, a quantum computer capable of ultra-high-speed computing was invented around 1980.

In the second half of the 1980s, many studied a method of achieving quantum computing using light quantum as a quantum bit, or as the minimum unit of quantum data, but this required a technology that could generate a single light quantum at a predetermined time. Those researchers who knew the reality of experiments in those days were skeptical about quantum computers.

Today, the circumstances are different. We are trying various possible approaches. Several methods of creating quantum computers have been proposed. However, the current trend toward creating quantum gates to control quantum bits and combining them to execute a quantum algorithm is not incorrect in mathematical terms, but I feel that it may not necessarily be right in engineering terms, because it's in direct opposition to nature. Everything in this world is connected to the outer world. However, the quantum register, which stores the data for a quantum computer, must be completely cut off from the outside world or the calculations will be in error. They say that computing will be possible if error correction is done, but humans are by no means capable of infinitely controlling natural phenomena. We need to think of a way that is not in conflict with nature but utilizes the essence of quantum mechanics.

Our group has proposed a quantum computer based on the totally new principle of combining it with a semiconductor laser. At the moment, we are working toward conducting the first basic experiment. If we manage to reach a quantum computer, we expect it will only take a short time to solve a difficult computational question that would require several years to solve even using a supercomputer. It is expected to use it for many different purposes, from basic physics to medical care.

Major inventions become practically applicable within five years after they are conceived. Our group leader says that if it can't be done in five years, it will probably never be done. Following his great determination, our group members are working on their research activities, aware that the next five years will be a critical make-or-break period. As one of thirty or more projects adopted under the Funding Program for World-Leading Innovative R&D on Science and Technology (FIRST) promoted by the government, we are hoping to pave the way for the development of this kind of quantum computer in three years.

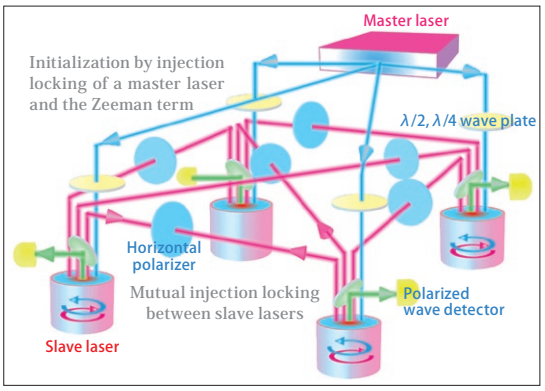


Figure: Discovery of an injection-locking laser system that could solve the NP-complete problem, which is said to be difficult to solve even with a supercomputer
S. Utsunomiya et al., *Opt. Express* 19, 18091-18108 (2011)

■Material and Life Informatics

Hiroko Satoh	Chemoinformatics / Computer chemistry / Molecular modelling
Asao Fujiyama	Comparative genomics research

■Intelligent Informatics

Ryutaro Ichise	Machine learning / Knowledge Systems / Data mining
Tetsunari Inamura	Human robot interaction / Synthetic study of robot intelligence based on stochastic information processing / Intelligent information processing based on embodiment of robots
Katsumi Inoue	Inference and Knowledge Representation / Hypothesis-finding based on Induction and Abduction / Knowledge Discovery for Systems Biology
Nobutaka Ono	Sound source localization • separation based on microphone array / Coding of acoustic signals based on a spectrogram / Analysis and processing of voice and music signals
Nigel Collier	Text Mining / Natural Language Processing / Ontology Engineering
Ken Satoh	Construction of multiagent systems with speculative computation / Applications of AI to Legal Reasoning
Hideaki Takeda	Knowledge sharing system / Semantic Web / Design theory
Shigeki Yamada	Research on ubiquitous and mobile networks and their applications / Research on Delay/Disruption-Tolerant Networks (DTNs)

Information Systems Architecture Science Research Division

Conduct research into the architecture and systemization of software and hardware for computers and networks.

Green innovations with ICT

Progress in energy conservation of ICT equipment and its active use

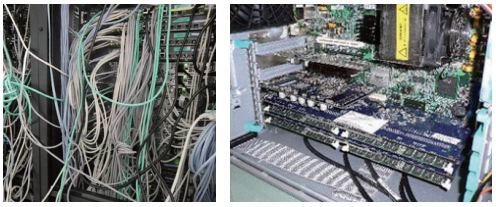
Michihiro Koibuchi

At present, information and communication technology (ICT) equipment is responsible for only a small percentage of worldwide power consumption. However, a data center operating a large number of computers consumes hundreds of megawatts. Increasing ICT power consumption at an accelerated pace is a crucial problem, in line with advances in ICT. It is necessary to create a system that reduces the power consumption of computers and other equipment through research on increasing the efficiency of ICT equipment to allow low-power operation.

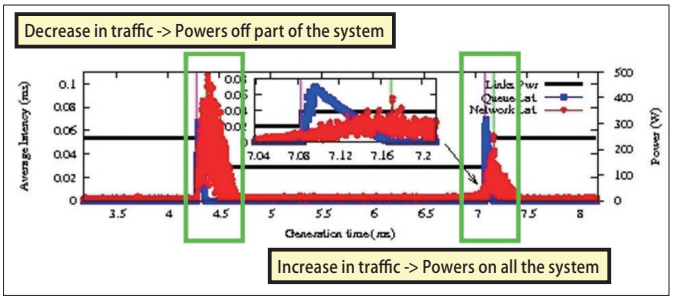
It is not easy to determine which method will lead to the least amount of power consumption. For any electrical appliance that consumes a large amount of power at startup, it is desirable to reduce the frequency of powering it on and off if it is often put into operation. However, it is advantageous to design it to be powered on and off each time it is used, if it is not put into operation very often. It is difficult to determine how often to power on and off. With respect to using computing to optimize operations, some argue that strict computing should be done to determine the level of optimization with great precision, whereas others say that it is preferable to avoid complicated approaches because complicated computing requires large power consumption. It is not easy to determine the level of effect per unit of electric power consumption.

To reduce carbon dioxide emissions that exacerbate global warming and green innovations, including reducing the consumption of oil and other non-renewable energy resources, Optimization of all controls and adjustment using ICT technology, including software, would bring very positive results to any industry. A good example is the smart grid. This is a next-generation power grid that controls both the demand side and the supply side of electricity to optimize power flow. In the future, two approaches, called "Green by ICT" and "Green of ICT," will both be necessary. The first refers to energy conservation using ICT, while the second one refers to the energy conservation of the ICT equipment itself. At the moment, research in the category of "Green by ICT" is underway on an open router technology, including a computing infrastructure that may serve as the basis of a smart grid.

We hope that these studies will develop an approach for eliminating waste and increasing efficiency across society, beyond the framework of information systems. Today, ICT capabilities are advancing at an astonishing pace, and everything is being computerized. This means that it is even more important to communicate different ideas and discuss them for the purpose of bringing about a major change in society.



A low-power interconnect test bed (left) and a low-power accelerator server (right)



Controlling the behavior of dynamic power conservation in the execution of parallel applications

Current Research Topics of Reseach Staff of NII

Network Architecture

Shoichiro Asano	Integrated control technologies for next-generation all-optical networks / Survival of network operation against natural calamities
Shunji Abe	Researches on performance analysis based on communication traffic measurement and QoS control method / Researches on mobile IP communication
Kensuke Fukuda	Measurement and analysis of Internet traffic / Network science

Information Network

Shigeo Urushidani	Dynamic resource optimization technologies for multi-layer networks / Universal switching system architecture
Yusheng Ji	Resource allocation and quality of service in communication networks / Network traffic modeling and analysis / Wireless ad-hoc and sensor networks

Computer Architecture

Kento Aida	Parallel and distributed computing / e-Science
Michihiro Koibuchi	Computer system networks / On-chip multiprocessor networks / Large-scale high-performance computing systems
Hiromichi Hashizume	Human interface with computer augmented reality / Collaboration support systems / Sensor applications

Internet security in the information-explosion era

Kensuke Fukuda

These days, it is becoming increasingly important to improve Internet security in line with the progress in cloud technology, which is paving the way for various online services, as well as widespread online banking and online shopping. Our research aims to detect abnormalities of how we can ensure safety against viruses, worms, and cyber-terrorism by quickly detecting abnormalities in an explosively growing sea of information.

We use a method that measures the online traffic, figures out what is happening, and detects any abnormalities. To put it differently, we use data volume and spatiotemporal changes to detect abnormalities caused by a worm, virus, or other malicious code that threaten user security, and understand its status through statistical means. Yet viruses and worms are always circulating in cyberspace. It is difficult to determine what should be considered abnormal. To advance our research, we defined abnormality as any status that is not normal, in hopes of quickly and accurately finding from the ever-increasing information those abnormalities that shouldn't be overlooked. We didn't just limit them to viruses, but also included abnormalities arising from faulty settings or equipment failure.

However, it is impossible to deal with unknown or continually changing mutant viruses, and it is difficult to detect all these viruses in the huge amount of data. To address this challenge, we have adopted a method of detecting abnormalities by comparing traffic behavior with normal status based on a statistical algorithm, without checking each of the contents. Our research is unique in that we were able to improve by combining multiple detectors based on their performance.

Also, a research approach to detecting abnormalities based on two-dimensional image analysis differs from a traditional method based on chronological analysis in that a position with probable abnormality is discernible at a glance. As shown in the diagram, after plotting the detection results on a single large graph using individual detectors, there is a high concentration of marks at a position rated as abnormal by a number of detectors.

It is hard to fight computer viruses, and can be likened to a rat race. I think that many researchers' ideas will need to be amassed in order to maintain a secure online environment.

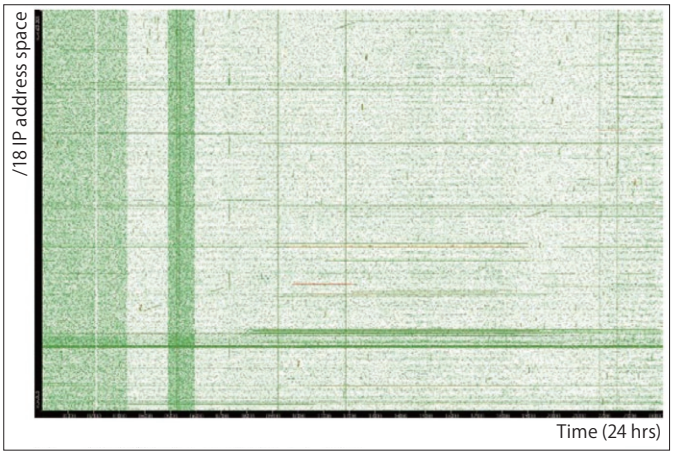


Figure: Traffic abnormalities in two-dimensional image display. Abnormalities are detected by analyzing the pattern of lines seen after plotting the abnormalities detected by sensors with multiple IP addresses in a chronological manner. The vertical line pattern indicates that more than one host is being attacked at the same time, whereas the horizontal line pattern shows that a single host is being attacked continuously.

Software infrastructure

Ichiro Satoh	Middleware for ubiquitous, mobile and distributed computing
Soichiro Hidaka	Bidirectional graph transformation / Optimization of XML query language
Zhenjiang Hu	Principle of Programming: Functional Programming, Programming Algebras / Software Engineering: Dependable Software Construction, Bidirectional Model-driven Software Development / Parallel Programming: Skeletal Parallel Programming, Automatic Parallelization

Software Engineering

Shin Nakajima	Dependable Software Engineering / Formal Methods / Model-Checking
Hiroshi Hosobe	Theory and solution of soft constraints / Constraint programming for graphical interfaces / Hybrid concurrent constraint programming
Shinichi Honiden	Autonomous Agents and Multiagent Systems / Ubiquitos Computing / Software Engineering
Nobukazu Yoshioka	Agent oriented software engineering / Agent Architecture / Security Software Engineering
Tomohiro Yoneda	Dependable VLSI system implementation based on asynchronous circuit technology / Formal verification of real-time software
Kenji Tei	Middleware for open wireless sensor networks / Software Engineering for Cyber-Physical System

Digital Content and Media Sciences Research Division

Conduct research spanning theories on the analysis, generation, accumulation, use and processing methods regarding diverse content and media, such as texts and video images, to their systemization.

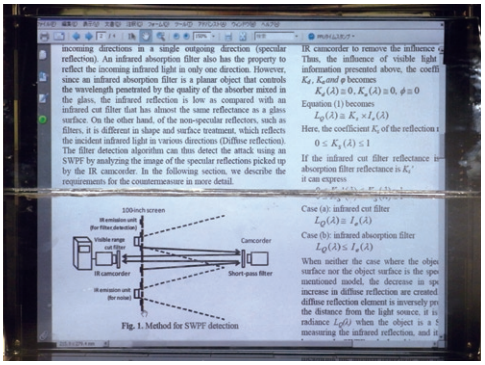
Don't film it! Preventing unauthorized photographing of displays and screens

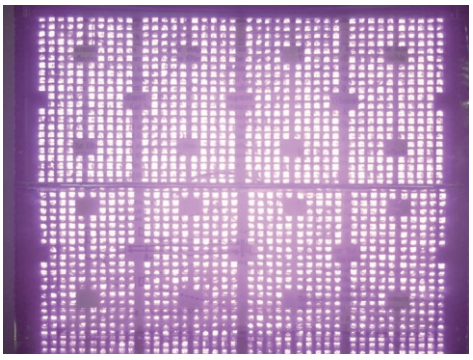
A technology to prevent unauthorized photography based on sensitivity difference between humans and devices

Isao Echizen

We send and receive personal data, video content, and various other digital data on a daily basis. This always involves the risks of information leaks and copyright infringement. To prevent these risks, technologies designed to prevent the unauthorized copying of digital content through cryptography has been widely used. However, some talk about the so-called analog hole problem. This means that cryptography can be bypassed by displaying digital content on a screen, turning it into an analog content, and then photographing the screen with a digital camera to convert the data back into digital content. In recent years, there have been many cases of copyright infringement where movies were recorded with camcorders in movie theaters and the recordings were sold as pirated editions, and many cases of information leaks where medical and airport control information displayed on screens was captured and uploaded for public consumption. Measures to prevent this unauthorized photography are now required.

Due to these circumstances, we have developed a technology that prevents the unauthorized photographing of onscreen data and content. We focused on the difference in spectral sensitivity characteristics between the human eye and image capture devices. By placing a near infrared light source, that adds noise without affecting what can be seen with the human eyes, on a monitor or screen, it invalidates unauthorized photography without having to add new features to existing digital cameras. This technology is expected to have a broad array of applications, including preventing unauthorized film recording in theaters, the capturing of confidential or personal onscreen information, and the photographing of artwork, plant equipment, and other objects that are not allowed to be photographed.





The interference effect of a technology to prevent unauthorized photographing of displays (using an LCD monitor example)
The newly developed unit to prevent unauthorized photography is placed on the front face of an existing monitor. It does not affect normal viewing of onscreen content. (See the upper photo)
However, when the image displayed on the screen is shot with a digital camera, near infrared noise is added in front of the image. As a result, the information displayed on the screen cannot be distinguished. (See the lower photo)

Current Research Topics of Reseach Staff of NII

Foundations of Content Management

Fuyuki Ishikawa	Description, analysis, and guarantee of functions and quality in the integration of Web services / Description, analysis, and verification of requirements and specifications in software development
Isao Echizen	Technologies and systems for multimedia content security / Integrity of multimedia content / Information hiding
Norio Katayama	Data Management Technology for Video Corpus Analysis
Hiroyuki Kato	Optimization for casual queries to database / Fundamental issues on optimizing queries to XML databases
Atsuhiro Takasu	Data mining and text mining / Information extraction from document stream / Distributed index processing
Akihiko Takano	Informatics of Association / Algebra of Programming
Kazutsuna Yamaji	Research data sharing and its metadata management / Platform system activating the research community

Text and Language Media

Akiko Aizawa	Identification and linkage of text information / Statistical language analysis and automatic construction of linguistic resources / Language media and interfaces
Jun Adachi	Information retrieval and integration of heterogeneous data / Modeling and implementation of high-performance information retrieval systems / Text mining
Keizo Oyama	Research on techniques for utilizing web information / Research on an integrated platform for scholarly information services / Research on full text search technology
Yusuke Miyao	Syntactic parsing, semantic parsing / Information extraction / Information retrieval

Providing local information targeted to a specific individual

A technology that selects content that supports your activities

Kenro Aihara

Aimed at helping users with local activities , location-based services (LBSs) are increasing and gaining attention. Many of these adopt a basic approach of suggesting several things that are close to the user's location. However, in downtown areas and other areas with lots of data, users may be inundated with information that does not match their interests, and find it difficult to find the information they need. In situations where people use mobile phones while walking around town, it would be desirable to have a service that gives them targeted information automatically. Until this convenience is realized, LBSs will have limited utility.

Because of this problem, we are working to develop a technology that selects and recommends content matched to individual users' activities. It will be incorporated into the *nicotoco* mobile service to assist in local activities that was launched in November 2011. By dynamically computing and comprehensively analyzing the user' s location and personal traits as well as the characteristics of the content near his or her location, it selects items it considers to best suit the user at their location. To compute personal characteristics, it collects and analyzes the user's local behavior and content access history as "behavioral log." In accordance with its findings, it calculates the user's traits, the characteristics of his or her local area, such as shops and other facilities, and similarities between them, including relevant data and other associated information. After comprehensive consideration of these computed characteristics and an information recommendation model based on behavioral values that we developed, it suggests some content.

Many conventional LBSs use a method of proposing content similar to users' preferences that is close to where they are. This technology paves the way for selecting and suggesting content from the standpoint of what should be visited next and what users will feel like visiting. It is expected to facilitate new local insights and discoveries, and help revitalize central city districts.

QR code sticker
When the user reads the QR code at a local store, they get certain advantages such as coupons, concessionary points, or stamp collecting services. The QR code history is saved in as behavioral log. By combining this log with user profile information, the system can provide information targeted to individual users.

■Pattern Media

Asanobu Kitamoto	Data mining from large-scale scientific image databases / Earth and environmental informatics / Digital archives for cultural heritage
Kazuya Kodama	A study on structure of multi-dimensional image information and communication systems of distributed shared image environment with real-time quality control
Imari Sato	Physics-based object shape and reflectance modeling / Creating spatially immersive displays for human computer interaction
Shin'ichi Satoh	A Study on video analysis, retrieval, and knowledge discovery based on broadcast video archives / A study on image retrieval
Akihiro Sugimoto	Sensing and understanding human activities in our daily life / Automatic modeling of 3D objects / Computer vision under the existence of digitization errors
Gene Cheung	image/video coding and streaming / immersive media communication
Hiroshi Mo	A study on case based video indexing / A study on intelligent video structuring
Duy-Dinh Le	Semantic representation for video indexing and retrieval / Advanced video search engines / Face annotation and retrieval / Video mining / Efficient methods for handling high

■Human and Knowledge Media

Kenro Aihara	Computer supported lifelong learning by using digital archives about historical and artistic objects / Integration of user's context in real- and virtual World
Frederic Andres	Model Driven Archicture knowledge management / Image learning ontology / Semantic tracking & computing
Ikki Ohmukai	Personal communication and interation in semantic web environment / Information sharing and distribution based on personal network
Helmut Prendinger	Life-like characters and avatars in virtual worlds / Participatory science and collaboration in the 3D Internet / Automatic content creation / Emotion and sentiment recognition from text
Mayumi Bono	Understanding Multimodal interaction / Understanding Conversational Structures in Multi-party Interaction
Seiji Yamada	Human-Agent Interaction / Interactive Information Gathering/Retrieval

Information and Society Research Division

Conduct interdisciplinary research on information and system technology and issues in the human and social sciences in a society in which the information society and the real world are integrated.

Understanding human and social activities from the massive data on the Web

Seeking to create data-centric human and social sciences

Noboru Sonehara

A transdisciplinary research integration project, aimed at creating data-centric human and social sciences, began in April 2011. The National Institute of Informatics (NII) is working with the Institute of Statistical Mathematics (ISM) to devise a method of effectively utilizing the enormous amount of data on the Web and support policy and decision making based on the data in an effort to build a crisis-resistant society.

In cyberspace, including the Web and SNS, there is a huge amount of data, and data sensing is now possible with information system technologies. We are working to create a cycle of processes in which data will be effectively collected and analyzed, and develop a model that can be applied to troubled areas of society in an attempt to change it for the better. We call this the "information circulation infrastructure." (See Figure 1)

For example, collecting hotel and transportation service booking data from the Web makes it clear on a real-time basis how people move every day. Data obtained from a public polling organization in a long-term fact-finding survey nearly concur with Web analysis data that is available instantly in terms of the number of visitors. This data can be used not only for rate information but also for planning marathons, international conferences, and other events in off season. The data can also provide scientific grounds for the design of long-term comprehensive social facilities, including determining locations for building new airports and tourist attractions.

These data are helpful for disaster control as well. It is not easy to fully utilize information systems in case of an emergency like a major earthquake unless users are accustomed to using them in everyday situations. So, in peacetime, human and social behaviors can be constantly monitored using Web and SNS data and utilized in tourism. In the event of a large earthquake, it is possible to use this data to quickly learn the status of lodging facilities and transportation systems so proper action can be taken. (See Figure 2) In case of a disaster or other emergency, information about who is located where is helpful for evacuation, relief and other aid operations.

We aspire to build a society where the security and reliability of information systems can be reasonably evaluated on the basis of scientific data. We are aware that building a social information infrastructure that is resistant to crises is one requirement informatics need to meet.

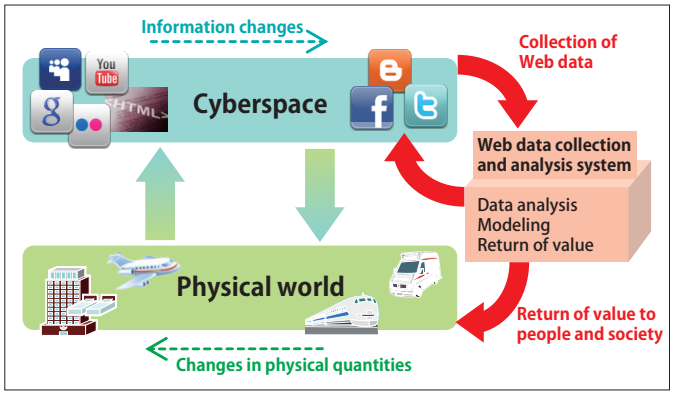


Figure 1: A Web data-driven information circulation system
The diverse and enormous amount of data obtained and collected in cyberspace is supplied to the physical world as information with new value. New information that arises in the physical world is reflected in cyberspace. This circulation of information between cyberspace and the physical world helps realize a better, more efficient society.

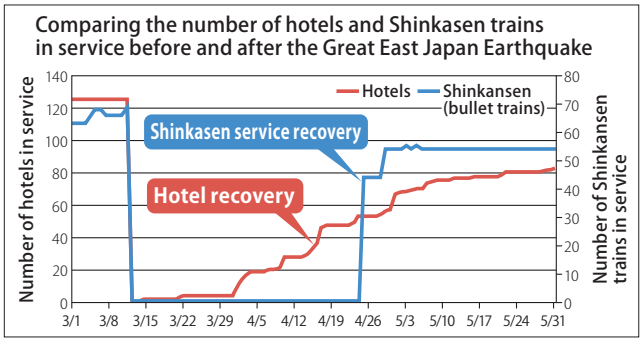


Figure 2: Real-time visualization of the recovery in the city of Sendai based on Web data
This is a real-time data-centric policy support system. In peacetime, it can be used to continually monitor status so that data can be used for tourism and other purposes. For immediate recovery from an earthquake, it can be used to effectively allocate resources to accelerate the recovery process.

Current Research Topics of Reseach Staff of NII

Information Use

Noriko Arai	Designing collaborative learning environment / Knowledge sharing, distance learning / Mathematical logic
Kouichirou Ueki	Development of the next generation information system
Noriko Kando	Evaluation of information access technologies / Exploratory search and user interface / Cognitive research for exploratory search / Extracting attitudes and relations from text / Cross-lingual information access
Hironobu Gotoda	Similarity search for 3D models / Visualizing citation links among research papers
Teruo Koyama	Term extraction from text corpora / Structurization of terms / Structural analysis of terms / Knowledge representation and use
Nobuhiro Furuyama	Speech-Gesture Coordination / Perception-Action Cycle in Communication
Akira Miyazawa	Union catalogue database construction and usage / Metadata representation and construction / Character codes as a fundamental tool for data representation / D: Data processing utilitiesndexing

Exploring the rise of new media and its impact on human society

Striving to bridge information sciences and social sciences

Tetsuro Kobayashi

My current research activities are centered on empirical studies of the social and political consequences of media use from a social psychological perspective. With respect to the social consequences, I focus on the effect of smartphones and other functionally advanced mobile communication terminals, examining their impact on the social network and social capital. Not confined to traditional sampling surveys, I pursue multi-method research, including acquiring communication logs from smartphone terminals for analyses and implementing field experiments with a random assignment. Not only pursuing orthodox media effect researches, I introduce new technological methodologies with the aim of establishing an interdisciplinary social science in collaboration with researchers in informatics, engineering, and other natural sciences. For example, the figure portrays a screenshot of a data collection application that runs on a smartphone. I aim to offer many researchers a basis for data collection and field experiments by providing valuable applications to them.

Regarding political consequences, I am studying how the electorate acquires political information through media including the Internet and other new media, and what impact it has on their voting behavior as a result. Today's media environment, with its wide variety of available information, allows individuals to choose what information they are exposed to. Some say this could fragment social realities and widen gaps in political knowledge. I empirically analyze how individuals process political information and how they cast their ballots in the new media environment that came into being through advances in technology, from the viewpoint of selective exposure to political information, fragmented social realities, incidental political learning through entertainment oriented media exposure, and the role of public broadcasting as a circulation base for political information. In these studies, I also employ a methodology that uses not only sampling surveys but also utilizes Web browsing history and other perspectives pertaining to informatics.

Figure: Developing a research infrastructure for communicating informatics
A screenshot of a data collection application that runs on a smartphone

Science Information

Yuan Sun	Research on Bibliometric Indicators for Research Evaluation / Network Analysis on Academic Research Collaborations / Research and Development of Web-based Adaptive Cognitive Diagnostic Tests
Masaki Nishizawa	Investigation study on network structure of information sciences related research and its trends / Empirical analyses on the role of Grants-in-Aid for Scientific Research for promotion of basic research / Empirical analyses on network for industrial-government-university cooperation in Japan

Information Public Policy

Hitoshi Okada	Research on Critical Growth Factors of E-Commerce and E-Money / Research on University Information Security Policy Portal (UISPP)
Tetsuro Kobayashi	Social and political consequences of ICT use / Social network and human communication / Social capital theory
Noboru Sonehara	Digital commerce (dCommerce) system / Intellectual property rights lifecycle management system

Grand Challenge

NII promotes studies on the following topics that may lead to breakthroughs in informatics.

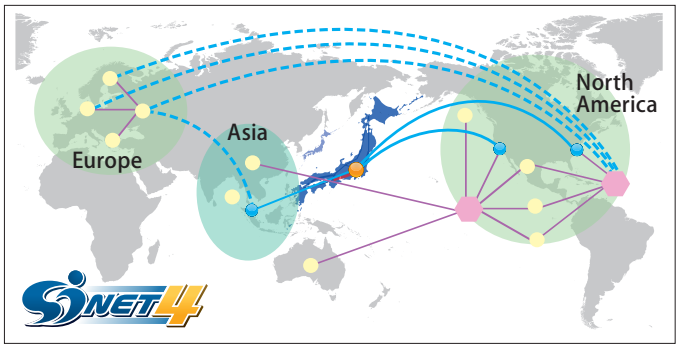
- Breakthroughs algorithms
- Dependable software
- Content value creation
- Bridging the semantic gap affecting image media
- ICT governance: its social system and legal system
- Artificial brain project

Projects

This project is designed to facilitate research in a comprehensive and interdisciplinary manner based on free ideas and creativity.

Cyber Science Infrastructure (CSI)

- Science Information Network SINET4
  Organization for Science Network Operations and Coordination
- Academic Content Service
  Organization for Scientific Resources Operations and Coordination
- UPKI (Inter-University PKI) joint public key infrastructure for universities
  Organization for Science Network Operations and Coordination



SINET is an information network developed as scholarly and academic information infrastructure for universities, research institutions, and other organizations throughout Japan.

Informatics for future value creation

- Quantum information processing project
  (Yoshihisa Yamamoto)
- Next-generation Informatics Research Infrastructure
- Development of the Fastest Database Engine for the Era of Very Large Database and Experiment and Evaluation of Strategic Social Services Enabled by the Database Engine
  (Masaru Kitsuregawa)

Next-generation software strategies

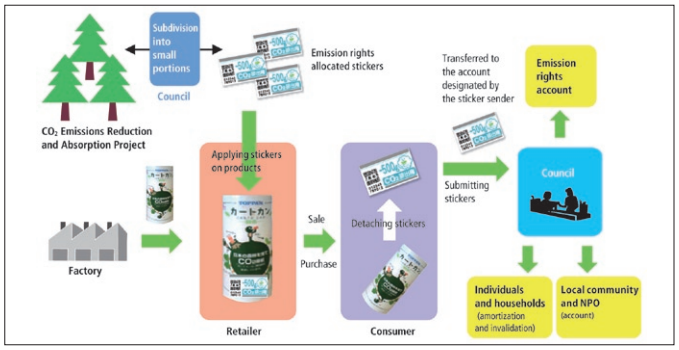
- Top SE (Education Program for Top Software Engineers)
  (Shinichi Honiden)
- Development of Dependable Network-on-Chip Platform
  (Tomohiro Yoneda)

Information environment/content creation

- Associative information access for spontaneous learning
  (Akihiko Takano)
- Content integration and handling technology for digital archiving
  (Jun Adachi)
- Thinking content - The Smartive Project
  (Shinichi Honiden)
- Research Infrastructure for Evaluation of Information Retrieval and Access Technologies – NTCIR (NII Test Collection for IR Systems)
  (Noriko Kando)

A solutions-seeking approach

- Global health tracking system: BioCaster
  (Nigel Collier)
- Technologies to reduce environmental impact based on IT
  (Ichiro Satoh)



In an attempt to build a low-carbon society through the use of RFID tags, a demonstration experiment on emissions trading was conducted. In this experiment, emission rights were divided into small portions and assigned to stickers affixed to products. Consumers who purchased these products specify the purpose of use of the emission rights portion assigned to the sticker when they return the sticker to the Council.

Social/public contribution

- Cultural Heritage Online in Japan
  (Yuzo Marukawa)
- IMAGINE –Federated associative search for heterogeneous information resources
  (Akihiko Takano)
- Information sharing system – NetCommons
  (Noriko Arai)
- Data-centric Social System Design Science
  (Noboru Sonehara)

net commons

NetCommons is used by more than 2,000 institutions across the country for various purposes, including for the websites of elementary, junior high, and senior high schools, the portals of academic societies, in-house groupware, and e-learning sites.

Integrated informatics

- The Bio-portal-in-Japanese Project
  (Asao Fujiyama)

Funding Program for World-Leading Innovating R&D on Science and Technology (FIRST Program)

NII is encouraging cutting-edge research and the strengthening of Japan's international competitiveness. In fiscal 2009, NII also decided the program in the Council for Science and Technology Policy as a program with the aim of benefiting the citizens of Japan and society with the research and development results.

Quantum Information Processing Project

http://first-quantum.net/

Using quantum entanglement, a central concept of quantum mechanics, NII is researching and developing based on Japan's trailblazing approach in four fields - measuring, standards, communication and information processing technology. NII aims to form a trend that leads the world.

(Principle Investigator : Yoshihisa Yamamoto)

Quantum technology is expected to be used in many different fields in the future. Applications include the ultra-high-precision optical clock that is considered to be a next-generation standard, untappable quantum cryptography, and quantum simulators and quantum computers far exceeding existing supercomputers. These applications based on quantum technology will be indispensable to future industrial development. Adopting the core concept of a quantum mechanics, this project conducts R&D through a unique approach. (Yoshihisa Yamamoto)

(http://first-pg.jp/about-us/yamamoto-yoshihisa.html)

Implementation structure

Core researcher
Yoshihisa Yamamoto, NII & Stanford University

Research support coordinator
Koichi Semba, NII

National Institute of Informatics: Operational support institution
RIKEN: Collateral institution
The University of Tokyo: Collateral institution

Subtopics

Quantum information systems Yoshihisa Yamamoto	Quantum standards Hidetoshi Katori, the University of Tokyo
Analog quantum computers/quantum information Yoshiro Takahashi, Kyoto University	Superconducting quantum computing Tsai, Jaw Shen, RIKEN & NEC Corporation
Quantum measurements Masamichi Yamanishi, Hamamatsu Photonics K.K.	Quantum communication Nobuyuki Imoto, Osaka University
Theory Yasuhiro Tokura, University of Tsukuba	Spin quantum computers Seigo Tarucha, the University of Tokyo

Development of the Fastest Database Engineering for the Era of Very Large Database and Experiment and Evaluation of Strategic Social Services Enabled by the Database Engine

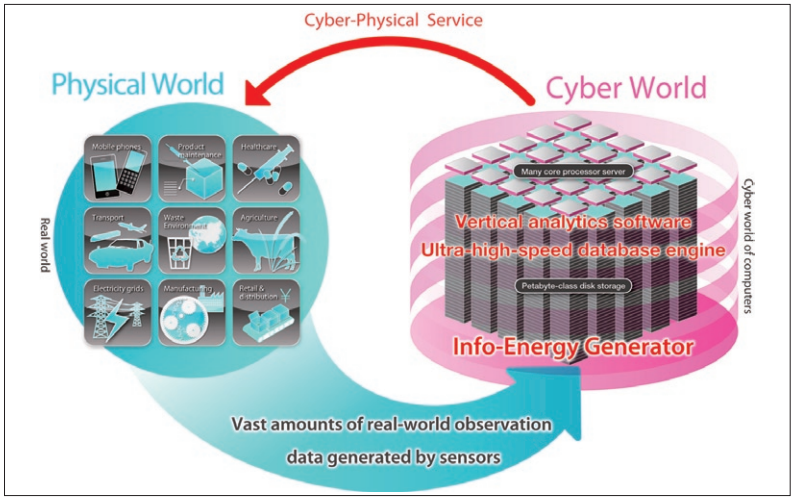
NII is working on the development of an ultra highspeed database engine for an era of superlarge databases, and the development of a non-conventional high-performance database engine with strategic social service proof and evaluation centered on this engine. Through high-speed data analysis, NII builds proofing systems for potential next generation strategic society services (cyberphysical services) and checks engine efficiency.

NII is engaged in research on subtheme 2: Information Creation Technology for Mega-Cyber-Physical Systems Infrastructure and Its Strategic Expansion to Society, led by visiting professor Naonari Ueda.

(Principle Investigator: Masaru Kitsuregawa)

Progress in information technology has been turning various materials in the real world where we live into digital data through the Internet and sensor networks. It is strongly hoped that a close and thorough analysis of this huge amount of data will lead to a fundamental reform of the social system and the birth of a new society service. This project is developing an Info-Energy Generator. With an ultra-high-speed database engine as its nucleus, the Info-Energy Generator has an unparalleled capacity to analyze super-large databases, allowing it to play a central role as a next-generation social platform. (Masaru Kitsuregawa)

(http://first-pg.jp/about-us/kitsuregawa-masaru.html)



Cyber-Physical Service

Research Center

Research and Development Center for Informatics of Association

Develop and provide IMAGINE – Federated Associative Search for Heterogeneous Information Resources as an outcome of R&D for the Generic Engine for Transposable Association (GETA).
http://rensou-center.cs.nii.ac.jp/

Research and Development Center for Academic Networks

Set up a network and electronic authentication infrastructure for use in CSI, benefiting from cutting-edge R&D in network development technology.
http://www.nii.ac.jp/nwcenter/

Research Center for Knowledge Media and Content Science

Promote cutting-edge research on the analysis and use of knowledge content in academic fields.

GRACE Center: Center for Global Research in Advanced Software Science and Engineering

Develop TOPSE and TOPRE by integrating research, practical application, and education in advanced software engineering.
http://grace-center.jp/

Research Center for Community Knowledge

Develop next-generation information and communications technology and information sharing platform system by creating "NetCommons" and "ReaD&Researchmap".

Global Research Center for Quantum Information Science

Promote activities such as cutting-edge research and personnel development to establish NII as a world-class international hub for quantum information.

Organization for Management and Outside Collaboration on R&D

Organization for Science Network Operations and Coordination

The Organization coordinates and operates the construction of Science Information Network, middleware and others as part of the core of Cyber Science Infrastructure (CSI).

Organization for Scientific Resources Operations and Coordination

The Organization coordinates and operates the management of scientific resources and the provision of services as part of the core of the Cyber Science Infrastructure (CSI).

Organization for Value Creation in Informatics

Meeting future social and technological requirements through value creation in informatics, the organization is making continuous research efforts are made to overcome grand challenges by organizing all Japanese universities and research institutions in each research area.

Research Cooperation

NII actively promotes research funded by Grants-in-Aid for Scientic Research, joint research with private organizations, and externally funded research.

Grants-in-aid for Scientific Research (FY2011)

(as of March 2012)

Research Categories	Number	Awarded Amount (thousands of yen)
Scientific Research (A)	4	45,500
Scientific Research (B)	15	72,020
Scientific Research (C)	12	15,340
Exploratory Research	10	17,810
Encouragement of Young Scientists (A)	2	9,750
Encouragement of Young Scientists (B)	11	17,160
Research Activity Start-up	2	1,963
Special Purposes	10	7,100
Scientific Research on Innovative Areas	2	22,360
Grant-in-Aid for Publication of Scientific Research Results	1	5,300
Total	69	214,303

Other grants (FY2011)

(as of March 2012)

	Number	Awarded Amount (thousands of yen)
Other grants	2	953,340

University-Industry Cooperation and Collaboration (FY2011)

(as of March 2012)

	Number	Amount Received (thousands of yen)
Joint Research with the Private Sector, etc.	17	22,844
Commissioned Research	24	379,927
Endowments	18	49,421
Others	5	31,730

■Collaborative Research

As an inter-university research institution, the NII provides opportunities for mutual exchange and research among researchers in universities and research institutions in Japan, while actively promoting many collaborative research projects.

NII Visiting Researchers (FY2011)

(as of March 2012)

Categories	Number
Visiting Researchers (Foreign Research Scholars)	29
〃 (JSPS Postdoctoral Fellowship for Foreign Researchers)	4
〃 (Others)	9
Cooperative Scholars	34
Requested Researchers*	84
Project Researchers	69
Special Joint Researchers	36
Total	265

* Of the whole body of Project Researchers, 13 have currently been accepted under the postdoctoral researcher system established by the NII.

Intellectual Properties

NII creates, collects, and manages intellectual property and promotes the use of this intellectual property to contribute to society.

Total Number of Inventions and Applications for Patents
(total number sincce FY2004)

(as of March 2012)

Total Number	109	Attribution：Organization Attribution	105
		Attribution：Individual Attribution	4
Applications Number	133	Domestic Number	94
		foreign number	39
Registration Number	23	Domestic Number	20
		foreign number	3

List of patents owned

(as of April 2012)

Patent	Registration Date	Joint Patent
Apparatus, method and program for retrieving and displaying image information	2010/ 1 /22	
Quantum key delivering method and communication apparatus	2008/12/19	
Time-series data analysis device, and time-series data analysis program	2011/ 5 /13	
Information-sharing equipment, information-sharing server, information-sharing method, and information-sharing program	2011/ 8 /12	●
Ultrasonic distance measurement system and ultrasonic distance measurement method	2007/11/22	
Sequential content delivery device, sequential content receiving device, and method therefor	2011/ 5 /13	
Contents presentation apparatus, contents presenting method and contents presentation program	2009/11/13	
Text content presentation apparatus, text content presentation method and text content	2008/ 6 /20	●
Communication traffic evaluation method using fragmentary self-similarity	2008/ 2 /22	
Imaging device and imaging method using out-of-focus structure	2010/ 1 /15	
Information resource retrieval device, information resource retrieval method and information resource retrieval program	2009/ 6 /19	
Active content distribution system, active content distribution program and active content distribution method	2009/10/23	
Traffic congestion forecast data generation equipment, traffic congestion forecast data generation method, and route search system	2011/ 4 /22	●
Content selling device and method	2009/ 5 /15	
Text-indexing equipment, document search equipment, and document classification equipment, method, and program	2009/ 8 /21	●
Video provision device and method	2009/ 8 /21	
Quantum key delivering method and communication apparatus	2011/11/18	
Time reference point information transmitting system and receiver	2010/11/12	
Collection/delivery route selection system	2009/ 9 /18	
Path management control method, path management control program, path management control device and path management control system	2011/ 8 /19	●
Information-Sharing System, Information-Sharing Server, Information-Sharing Method, and Information-Sharing Program	2007/ 7 /24	●
Time Reference Point Information Transmitting System and Receiver	2011/ 2 / 1	
Time Reference Point Information Transmitting System and Receiver	2011/ 1 /12	

List of registered trademarks

(as of April 2012)

Trademark mode	Registration number	Trademark mode	Registration number
NII	4811291	Commons Partners	5208443
Net Commons	4832775	NeXt Commons	5191260
図形+NET	4934163	researchmap	5261160
NAREGI*	4952143	GRACE+図形	5275386
トップエスイー	4943324	図形(grace)	5261216
スマーティブ	4976131	図形 (garce/NPO)	5279082
WebELS	4980388	edubase	5296963
Net Commons	5182361	学認/GAKUNIN	5341899
n c net commons	5152641	NetCommons Ready	5369242

* NAREGI is also a registered trademark in the United States, United Kingdom, and Germany (Registration Number: 4952143).

TopSE and edubase : Education Services for IT specialists

GRACE Center provides TopSE education program, edubase Cloud and edubase Space for education environment for IT specialist, and edubase Stream as a portal site aimed at continuously disseminating and developing good IT educational materials. These services aim at cultivating the leading IT specialists who have the ability to take the initiative in software development in companies and other entities.

TopSE :
intellectual manufacturing education founded on science
http://www.topse.jp/english/

The TopSE education program is a practical education program aiming to cultivate software engineers who have acquired highly advanced development techniques based on the concept," intellectual manufacturing education based on science."
Many young software engineers and researchers from industry are joining the practical program on the basis of practices.

TopSE Certification

edubase Space :
Creation of Intelligence in the Ubiquitous Environment
http://edubase.jp/space/

edubase Space offers an ideal educational environment in advanced IT human resource development, in which students are encouraged to discover problems and cultivate their imagination. It supports education conducted in various styles, including lectures, discussions, group work, as well as distance learning. A classroom equipped with the latest IT equipment can also be used as an experimenting ground in the Ubiquitous environment.

edubase Space

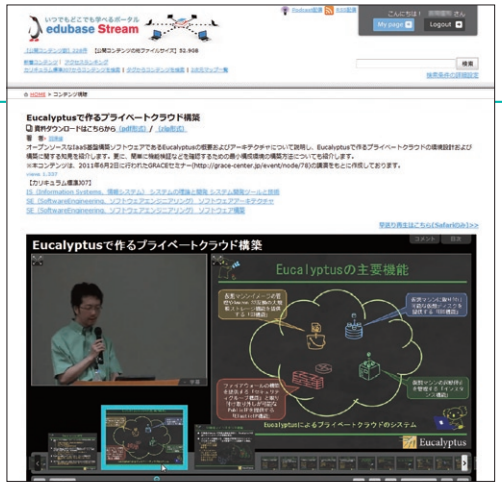
edubase Cloud :
An IT laboratory where you can test your ideas without restraint
http://edubase.jp/cloud/

edubase Cloud can create an environment in which you can acquire necessary IT resources when needed, and can test your ideas without restraint. Utilization of Cloud in the actual training grounds is expected, from basic technology of Cloud to Project Base Learning in the IT field.

Cloud server room

edubase Stream :
Portal site for Learning Anytime Anywhere
http://stream.edubase.jp/

edubase Stream provides video educational materials of the cutting edge software science and engineering developed by universities and institutes in Japan, in addition to conventional educational material. The site synchronizes video materials with the sides to allow us to lean software technologies easily anytime anywhere only with the Internet ready browser.



edubase Stream

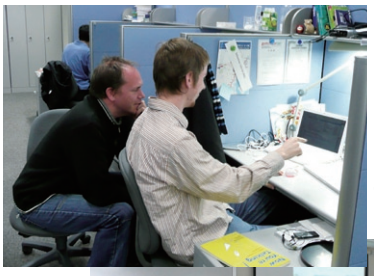
Graduate Education Activities

http://www.nii.ac.jp/graduate/index_e.html

NII provides graduate education under the three main forms described below, in its efforts to train leading researchers capable of combining a broad view with advanced specialization. Students develop the ability to address challenges by capitalizing on NII's unique strengths, including comprehensive informatics research systems and a practical environment in which theoretical research and practical development are combined.

(1) Participation in the Graduate University for Advanced Studies (also known as"SOKENDAI")
(2) Cooperation with graduate universities
(3) Special collaboration with research students

Guidance for new students



Graduate students office

Lecture

Degree Awarding Ceremony

Department of Informatics, The Graduate University for Advanced Studies (SOKENDAI)

Establishment of the Department

The Department of Informatics (advanced Ph.D. program), which began at SOKENDAI with the participation of the NII in April 2002, saw its first class of students graduate in March 2005.
And SOKENDAI introduced A five-year doctor course program from 2006. (Admission Quota - A five-year doctor-course program: 4 / A three-year doctor course program: 6) SOKENDAI was Japan's first university to provide doctoral programs solely with the objectives of encouraging original and international academic studies that transcend conventional disciplinary frameworks and developing cutting-edge academic disciplines to create new directions in science.

Aims and Structure of the Department

The Department's goal is to foster outstanding young international IT researchers and technicians. Students work toward obtaining a Ph.D. The Department covers the following six research areas, and offers a total of over 70 subjects.

- Fundamental Informatics
- Foundations and Infrastructure Science
- Software Science
- Information and Media Science
- Intelligent Systems Science
- Information Environment Science

Description

Since its start, the Department of Informatics has proactively accepted students from overseas. For this reason, the department features lively cultural exchanges among its diverse student body. The Department of Informatics welcomes international students. There is active cross-cultural exchange among students. The Department also has a large number of students holding full-time jobs. They account for at least 30% of all students in the department.

Enrollment

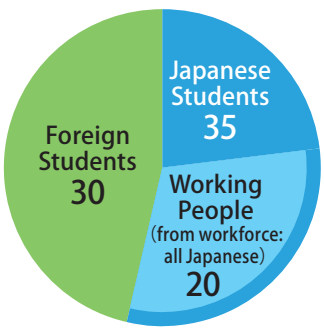
(as of April 2012)

A five-year doctor course program	A three-year doctor course program	Research Student	Total
31(18)	34(12)	1(1)	66(31)

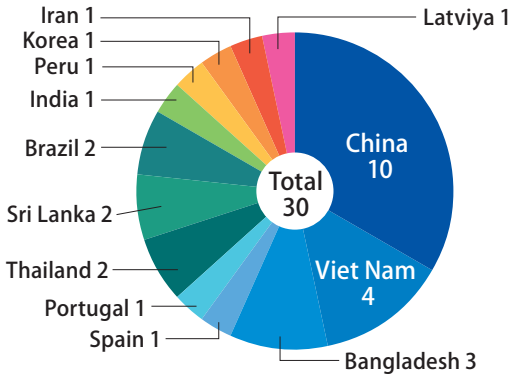
( ) Foreign students among total

Students Data (as of April 2012)

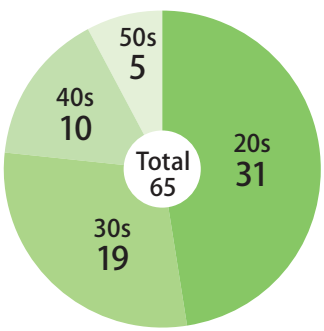
Current Students



Nationalities of Foreign Students



Age distribution



Career options (past three years)

(past three years)

Year of Graduation	University/Institution	Company	Not yet determined	Total
FY2011	8 (3)	1 (0)	2 (1)	11 (4)
FY2010	4 (2)	3 (1)	0	7 (3)
FY2009	8 (5)	3 (1)	1 (1)	12 (7)
Total	20 (10)	7 (2)	3 (2)	30 (14)

( ) Foreign students among total

Cooperation with Graduate Universities

NII actively cooperates with the graduate university of Tokyo, Tokyo Institute of Technology, Waseda University and JAIST. NII also accepts graduate students from these institutions for additional instruction.

Cooperation with graduate Universities

University	Graduate School	
The University of Tokyo	Graduate School of Information Science and Technology	FY2001～
Tokyo Institute of Technology	Graduate School of Information Science and Engineering	FY2002～
	Interdisciplinary Graduate School of Science and Engineering	FY2003～
Waseda University	Graduate School of Fundamental Science and Engineering	FY2005～
	Graduate School of Creative Science and Engineering	
	Graduate School of Advanced Science and Engineering	
JAIST (Japan Advanced Institute of Science and Technology)	School of Information Science	FY2009～
Kyushu Institute of Technology	Graduate School of Computer Science and Systems Engineering	FY2010～
	Faculty of Computer Science and Systems	

Special Collaboration with Research Students

NII accepts students from other universities as research students in special collaborative projects, fostering both research and education.
These students not only benefit from our extensive research databases and our infrastructure for information exchange, but also perform research under the instruction of NII research staff.

Universities of students

(as of April 2012)

University	Graduate School
Tokyo Institute of Technology	Interdisciplinary Graduate School of Science and Engineering
The University of Electro-Communications	Graduate School of Informatics and Engineering
Ochanomizu University	Graduate School of Humanities and Sciences
Stanford University	
École Polytechnique	

The number of students from other universities for special collaboration or cooperation between graduate universities is shown in the table on the right.

Students from other universities

(as of April 2012)

Master Course	Ph.D. Course	Research Students	Total
37	34	0	71

NII Library

The NII Library holds a number of books and periodicals on informatics, including on-line journals as part of its role as an informatics research/education center.
Library collaborates with the nearby Meiji University Library to provide access to information of academic documents for students of the Graduate University for Advanced Studies.

Inventory, Magazine titles

(end of March 2012)

Document type	Books	Bound journals	Journals (in title)
Domestic Documents	13,437	9,002	279
Foreign Documents	12,200	8,116	48
Total	25,637	17,118	327

Major on-line journals and databases

Service	Publisher
ACM Digital Library	Association for Computing Machinery
APS online	American Physical Society
CUP online	Cambridge University Press
IEL	IEEE, IEE
MathSciNet	American Mathematical Society
OUP online	Oxford University Press
Springer Link	Springer
Science Direct	Elsevier B.V.
Wiley Interscience	John Wiley & Sons.
IEICE	The Institute of Electronics, Information and Communication Engineers

Facility, Equipment

	Reading room	Stack room
Area	140㎡	271㎡
Seats	8	3
PC for search	2	—
Other equipment	Automatic Book Circulation Machine (IDEC PalsRC15E)	
	Micro reader printer (Konika Minolta SP7000)	
	Copier (DocuCentre-III C2200)	

Reading Room 1

Reading Room 2

Subscribed journals

International Exchange

As Japan's sole comprehensive academic research institute in the field of informatics, the NII presents research results to the world and strives to contribute globally through efforts related to informatics – by promoting active international exchange among researchers and students and helping to establish informatics research bases – as a partner in various international joint projects.

Overview

NII established the Global Liaison Office (GLO) in order to actively promote international cooperation with prominent overseas institutes. The GLO is concluding International Exchange Agreement (MOU) with the organizations and implementing a variety of measures that promotes international research exchanges.

Data

(as of April 2012)

Number of MOUs 2012	73 institutions from 19 countries
NII Internship Program 2011	100 students from 15 countries
MOU Grant/ Non-MOU Grant 2011	25 persons to 13 countries 53 persons from 17 countries

Intercommunication of researchers

(as of April 2012)

Program		Number of researchers
Japan Society for the Promotion of Science (JSPS)	Postdoctoral Fellowships for Foreign Researchers	2
	Postdoctoral Fellowships for Foreign Researchers (Short-term;for researchers from Western countries)	0
	Invitation Fellowship Program for Research in Japan	0
Other researchers accepted (visiting researchers, visiting professor [full-time])		27

International Exchange Agreement

(as of April 2012)

Country		Organization
People's Republic of China	●	Department of Automation, School of Information Science and Technology, Tsinghua University
	●	Institute of Computational Mathematics and Scientific/Engineering Computing, Academy of Mathematics and System Sciences, Chinese Academy of Sciences
	●	School of Electronics and Information Engineering, Tongji University
	●	School of Electronics Engineering and Computer Science, Peking University
	●	Hong Kong University of Science and Technology (HKUST)
	●	The School of Electronic, Information and Electrical Engineering, Shanghai Jiao Tong University
	●	University of Science and Technology of China
Taiwan	●	College of Electrical Engineering and Computer Science, National Taiwan University
Kingdom of Thailand	●	Chulalongkorn University
	●	Asian Institute of Technology
	●	Kasetsart University
	●	National Electronics and Computer Technology Center, National Science and Technology Development Agency (NECTEC)
Socialist Republic of VietNam	●	International Research Center MICA, Hanoi University of Technology
	●	Hanoi University of Science and Technology
	●	Vietnam National University of Ho Chi Minh City
	●	Vietnam National University, Ho Chi Minh City, University of Science
	●	Vietnam National University, Hanoi, University of Engineering and Technology
People's Republic of Bangladesh	●	University of Dhaka
Republic of Korea	●	Department of Computer Science and Engineering, Seoul National University
	■	Korea Education & Research Information Service
Republic of Singapore	●	School of Computing, National University of Singapore
Australia	●	The Australia-Japan Research Centre, The Australian National University
	●	National ICT Australia Limited (NICTA)
	●	The Faculty of Engineering, Physical Sciences and Architecture, The University of Queensland
	●	Faculty of Engineering and Information Technologies, The University of Sydney
United States of America	●	Department of Computer and Information Science, University of Michigan-Dearborn
	●	College of Engineering, Universi t y o f Washington, Seattle
	●	University Information Technology Services, Indiana University
	●	Department of Computer Science, University of Maryland
	●	New Jersey Institute of Technology
	●	International Computer Science Institute
	■	North American Coordinating Committee on Japanese Library Resources
	■	Institute for Scientific Information, Inc.
	■	Association of Research Libraries (ARL)

Country		Organization
Canada	●	Faculty of Mathematics, University of Waterloo
	●	University of Alberta
	●	School of Computer Science, McGill University
	●	Simon Fraser University (SFU)
Irland	●	University of Limerick
French Republic	●	Computer Laboratory Nantes Atlantique, University of Nantes
	●	National Institute for Research in Computer Science and Control(INRIA)
	●	Grenoble Institute of Technology(INPG)
	●	Joseph Fourier University(UJF)
	●	Laboratory of Computer Sciences, Paris6 (LIP6), Pierre and Marie Curie University
	●	National Polytechnic Institute of Toulouse(INPT)
	●	National Center for Scientific Research (CNRS)
	●	Paul Sabatier University(UPS)
United Kingdom of Great Britain and Northern Ireland	●	Department of Computer Science, Faculty of Engineering Science, University College London
	●	Faculty of Mathematics and Computing, Open University
	●	University of Bristol
	●	University of Bath
	●	Department of Computing, Imperial College London
	●	The Computing Laboratory, University of Oxford
	●	School of Computer Science & Electronic Engineering, University of Essex
	●	School of Informatics, The University of Edinburgh
Federal Republic of Germany	●	Faculty of Applied Informatics, University of Augsburg
	●	German Research Center for Artificial Intelligence (DFKI)
	●	Faculty of Applied Science, University of Freiburg
	●	Faculty of Mathematics, Computer Science and Natural Sciences, RWTH Aachen University
	●	German Academic Exchange Service (DAAD)
	●	Saarland University
	●	Faculty of Mathematics, Informatics and Statistics, University of Munchen
	■	University Library Center of North Rhine-Westphalia(HBZ)
	■	German National Library of Science and Technology
	■	German National Library of Medicine
Kingdom of the Netherlands	●	Faculty of Civil Engineering and Geosciences, Delft University of Technology
Republic of Austria	●	Vienna University of Technology
Republic of Italy	●	Department of Informatics, Torino University
Czech Republic	●	Czech Technical University in Prague
Spain	●	Polytechnic University of Valencia(UPV)
	●	Polytechnic University of Catalonia(UPC)
Portuguese Republic	●	Institute of Investigation and Development of Computer system,Engineering in Lisbon(INESC-ID)
Arab Republic of Egypt	●	Egypt-Japan University of Science and Technology

●For research cooperation
■For development and operational cooperation

NII Shonan Meeting

http://www.nii.ac.jp/shonan/

In February 2011, the NII launched the NII Shonan Meetings, the first Dagstuhl-style seminar* held in Asia. The purpose of the NII Shonan Meetings is to resolve various challenges in th e field of informatics by assembling the very best researchers from around the world to engage in intensive discussions on issues in the field of informatics in an atmosphere that promotes close interaction.
The meeting's venue, the Shonan Village Center, provides an environment in which participants can focus on research activities in a setting that provides both spectacular natural beauty and easy access from Narita Airport.

*Dagstuhl Seminar: A key seminar series in the field of informatics, held roughly every week, in Dagstuhl, Germany. The series is based on a structure whereby participants live in close quarters for one week for intensive discussions on various topics under a specified theme for each seminar.

Shonan Village Center

Support System

The Office of NII Shonan Meetings and Shonan Village Center staff handle various activities on behalf of seminar management, including issuing invitations, providing information on lodging and accommodations, and preparing venues on meeting days.
The program also includes various activities intended to deepen interaction between participants, including hikes in nearby natural areas and historical walking tours of Kamakura.

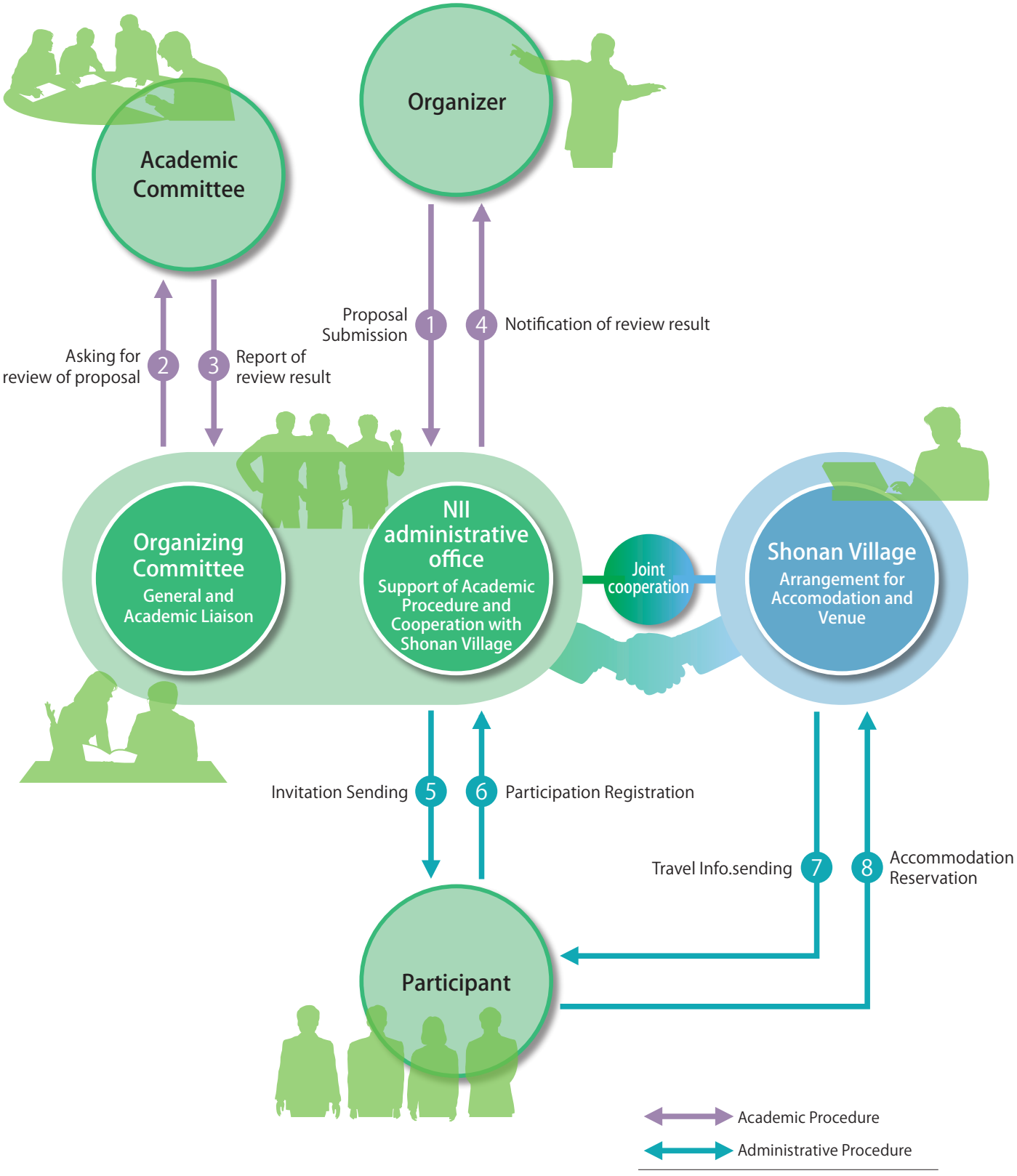
Participants from all over the world animatedly discuss their research

NII Shonan Meeting (January 2012)

The Recent Topics of the NII Shonan Meetings

1. Graph Algorithm and Combinatorial Optimization Feb. 13-18, 2011, 39 participants
2. The 14th Agda Implementors Meeting Sept. 8-14, 2011, 19 participants
3. Dependently Typed Programming Sept. 13-17, 2011, 29 participants
4. Knowledge-Leveraged Computational Thinking through Natural Language Processing and Statistical Logic
   Sept. 18-21, 2011, 20 participants
5. Automated Techniques for Higher-Order Program Verification Sept. 22-27, 2011, 25 participants
6. Hybrid Quantum Devices Nov. 5-9, 2011, 24 participants
7. International Symposium on Symbolic Systems Biology (ISSSB'11) Nov. 13-17, 2011, 31 participants
8. Large-Scale Distributed Computation Jan. 11-16, 2012, 32 participants

■Scheme



Call for proposal

We welcome your proposal any time through a whole year, although submission is closed in June 15th, September 15th and December 15th. After the proposal is reviewed and approved by NII's Scientific Committee, the result will be notified.

Contact: The Office of NII Shonan Meetings shonan@nii.ac.jp

Japanese - French Laboratory for Informatics:JFLI.

The Japanese-French Laboratory for Informatics (JFLI) was created in 2009 as a hub for the collaboration in informatics between Japan and France and regroups French National Center for Scientific Research (CNRS), University Pierre& Marie Curie (UPMC, Paris 6), University of Tokyo (Graduate School of Information Science and Technology), the NII and Keio University. 2012 will see an extended cooperation between the same partners who have decided to create an International Mixed Unit (UMI), which will focus on 5 main topics : (1) Next Generation Networks, (2) High Performance Computing, (3) Software, Programming Models and Formal Methods, (4) Virtual Reality and Multimedia and (5) Quantum Computing.

Exchange Result
(FY 2011)

# of Joint Paper	12
# of Joint Workshop	3

JFLI Establishment Agreement Signing Ceremony

International Exchange Agreement concluded with German Academic Exchange Service (DAAD)

http://glo.nii.ac.jp/

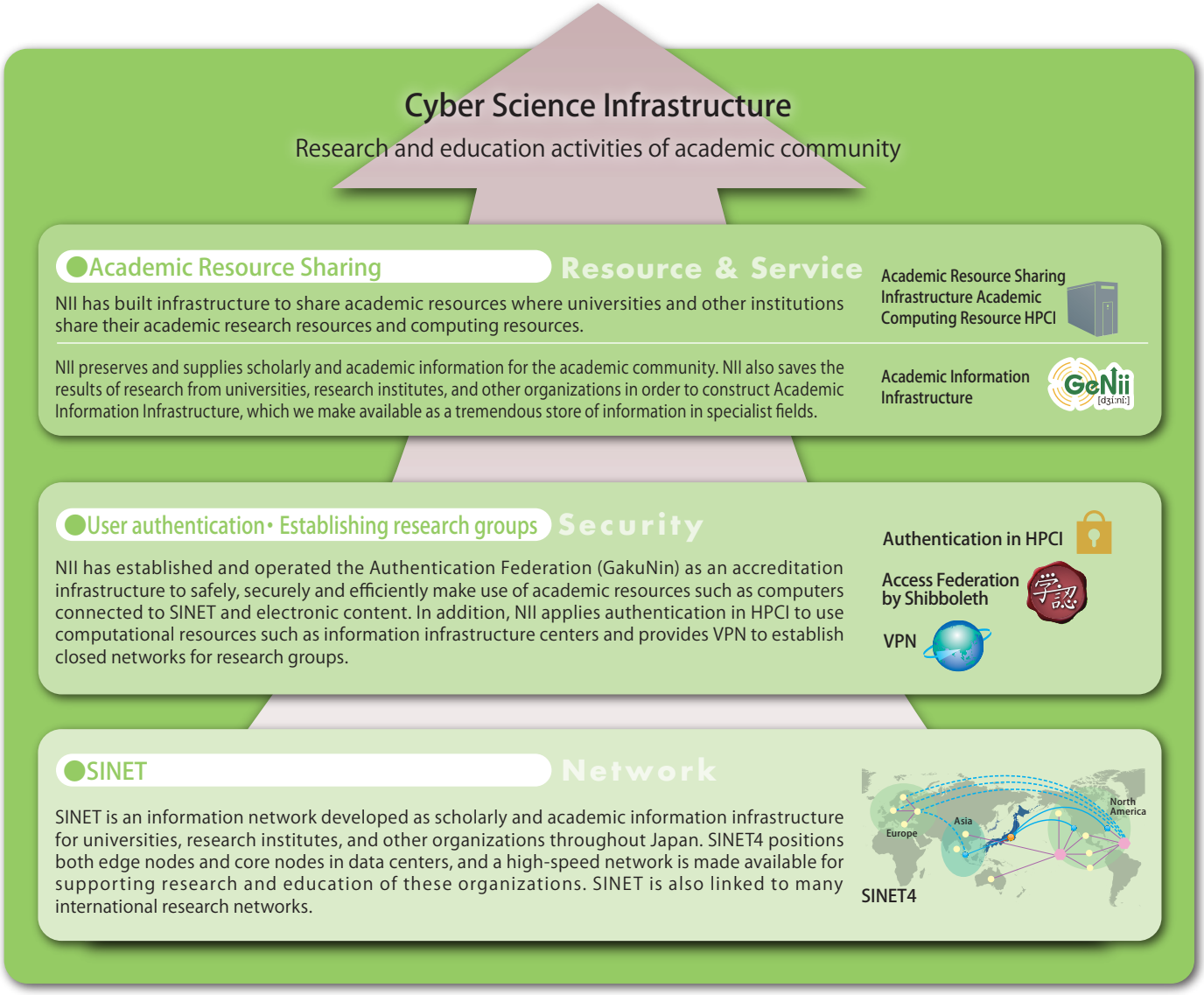
Under an MOU concluded with the German Academic Exchange Service (DAAD), the NII launched a program (a research program based at the International Science and Technology Center) whereby it accepts up to 10 German post-doctorate researchers per year over the four-year period from fiscal 2009 through fiscal 2012. This program covers two institutions: the NII and the International Computer Science Institute (ICSI) in Berkeley, California.
Under the guidance of the accepting instructors, researchers spend their time at the NII pursuing research in the field of informatics.
This program also provides research grants to researchers.

Consolidation of Cyber Science Infrastructure (CSI)

http://csi.jp/

NII is promoting the consolidation of the Cyber Science Infrastructure (CSI) through cooperation with universities and other organizations. CSI means an information environment that incorporates and utilizes various research activities and results from universities and research institutions – such as supercomputers and other distinctive scientific utilities and resources, scientific software and databases, and human resources that Japanese universities and research institutions possess – over a super high-speed network, transcending the borders of organizations or scientific fields. This infrastructure will guarantee an environment that enables the promotion of cutting-edge higher education as well as research and development of technology in universities, research institutions, and industry. NII puts in strategic efforts to the following areas, as expanding the various development projects and operations it has implemented to date within the framework of the CSI.

1. Establishment of science information network, grid environment, and UPKI through cooperation between NII, the university IT centers and other organizations
2. Establishment of the infrastructure for next-generation scientific resources through cooperation between NII, university libraries, academic societies and other organizations

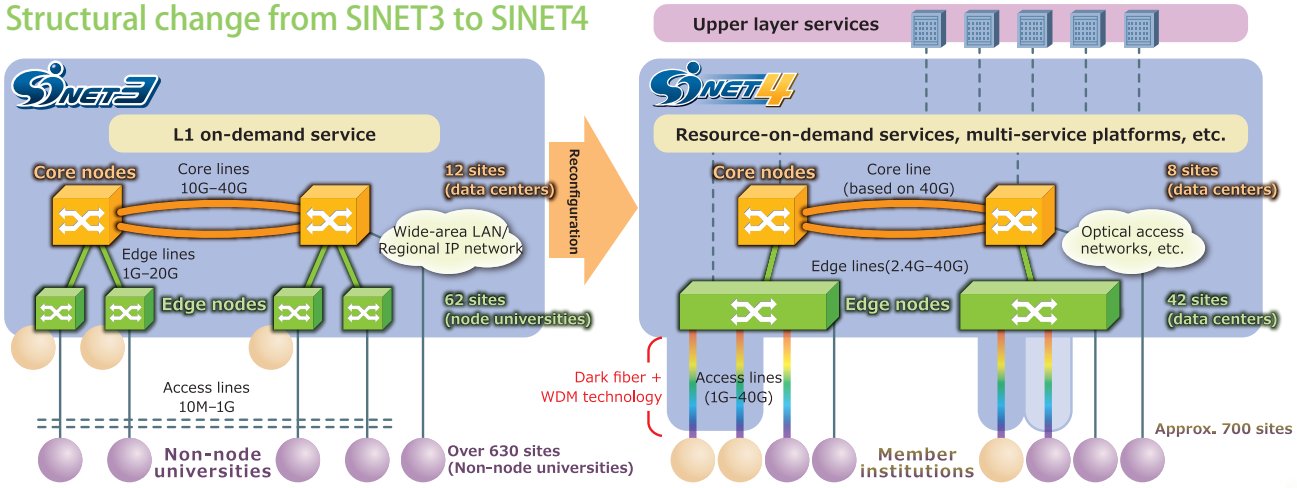


NII, universities and other research institutions will collaborate and cooperate closely to facilitate the above, and Japan's academic community will work as one to prepare and vigorously promote the framework for advancing CSI construction.

Science Information Network (SINET4) http://www.sinet.ad.jp/

The Science Information Network (SINET) is an information and communication network connecting universities and research institutions throughout Japan via nationwide connection points (nodes). It is designed to promote research and education as well as the circulation of scientific information among universities, research institutions, and similar entities. SINET is also connected to research networks such as Internet2 in the U.S. and GÉANT2 in Europe to facilitate dissemination of research information and collaborations over networks.
SINET4 began operations in April 2011, and it replaces the previous SINET3. SINET4 plays an important role as the core component of the Cyber Science Infrastructure(CSI).

Structural change from SINET3 to SINET4



■Characteristics of SINET4

❶Higher network speed

The effecitive network bandwidth has been increased and the rerouting function has been improved by reconfiguring the network and adopting solutions including dark fiber and WDM technology. This has made the network even more cost effective.

❷Provision of diverse services

SINET4 inherits all of SINET3,s services, with services such as resource-on-demand strengthened and expanded.

❸Higher edge node stability

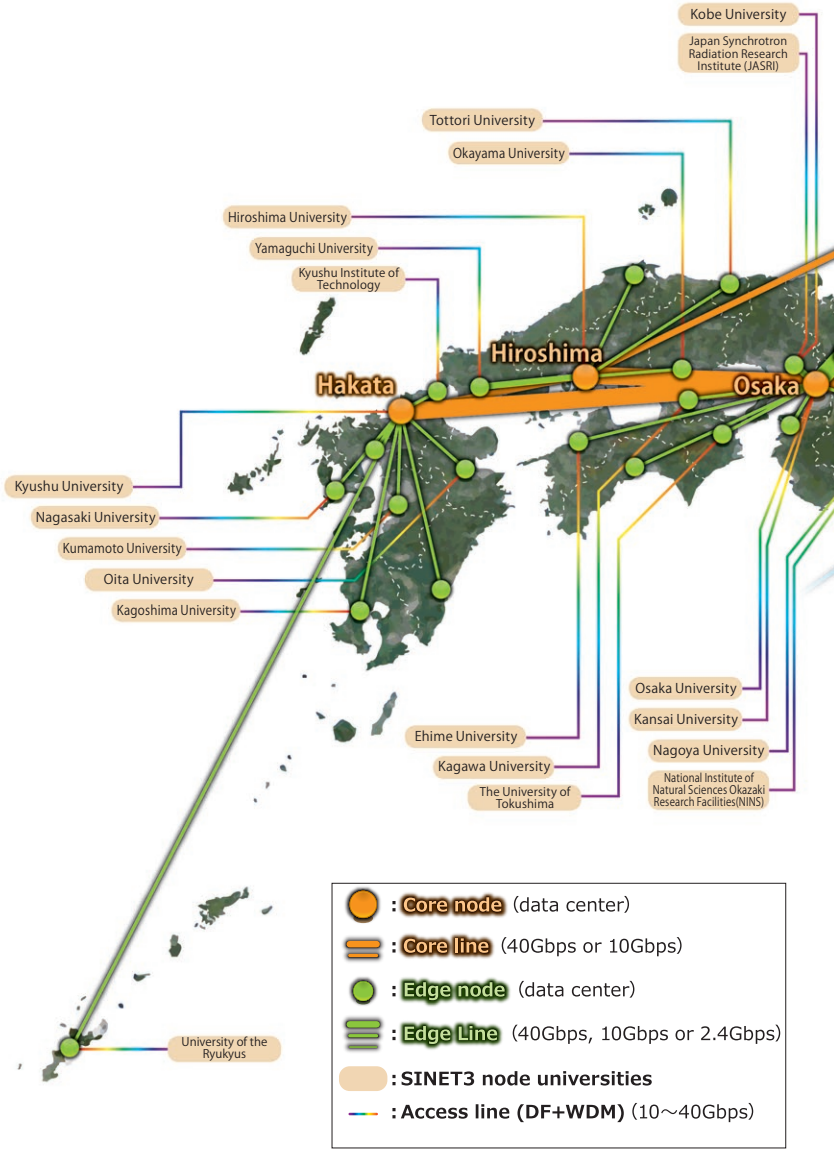
SINET4 positions both edge nodes and core nodes in data centers, improving the reliability of the network including its availability, maintainability, and security.

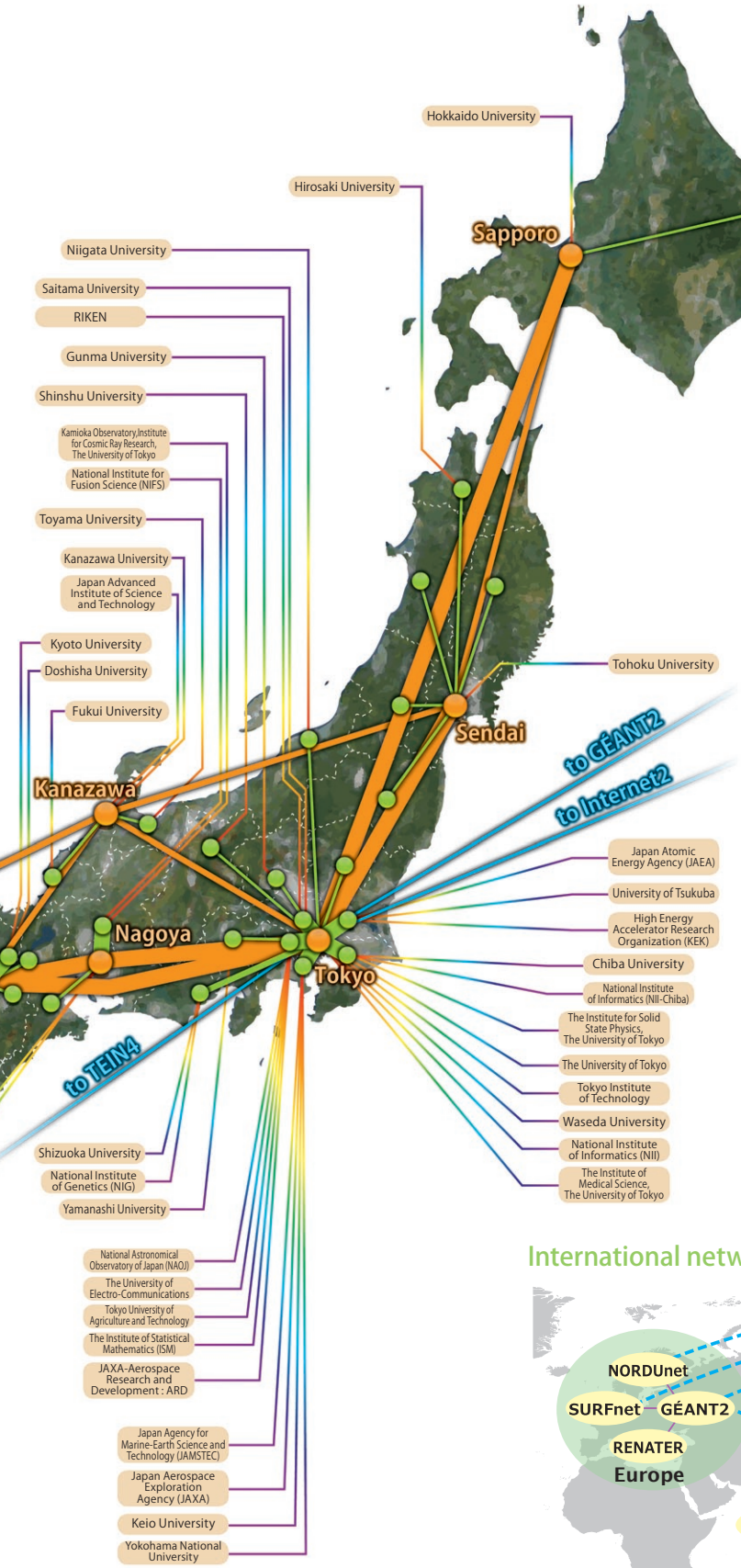
❹Establishment of an environment for high-speed access lines

By undertaking shared procurement of access lines, a faster access system has been created for member institutions other than those on site (SINET3 node universities). In addition, installment of nodes is scheduled to be completed within FY2011 in all prefectures in Japan.

❺Upper layer deployment

Installation of interfaces and service-providing platforms to support the upper layer is being considered.





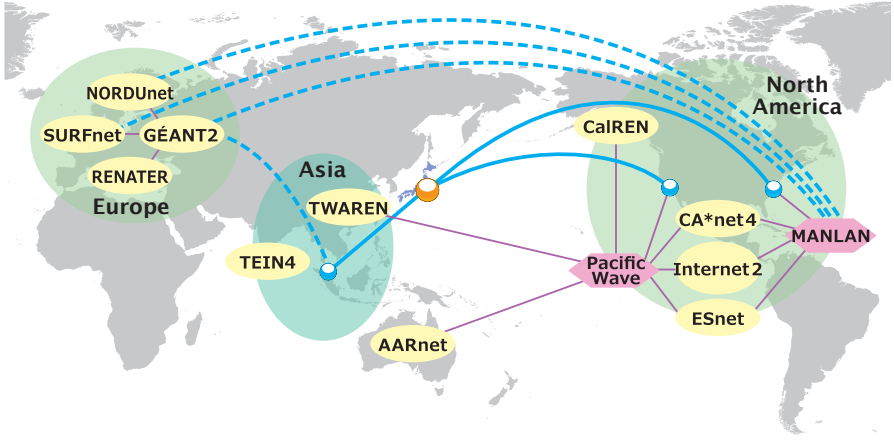
Participating SINET Institutions (as of March 31, 2012)

National universities	86
Municipal universities	62
Private universities	312
Junior colleges	61
Technical colleges	56
Inter-University Institutes	16
Others	176
Total	769

SINET4 Services (Classification bynetwork layer and QoS)

	IP (L3)	Ethernet (L2)	Lambda/ Dedicated (L1)
QoS-guaranteed			On-demand BW-specified L1VPN Lambda L1VPN
High Priority	L3VPN(QoS) Multicast (QoS) Application-based QoS	On-demand VPLS (QoS) L2VPN(QoS)	
Best Effort	L3VPN Multicast Multi-homing IPv4/6	On-demand VPLS L2VPN	

International network collaboration



Establishment of Authentication Infrastructure

Academic Access Management Federation in Japan (GakuNin)

https://www.gakunin.jp/docs/en/fed/about

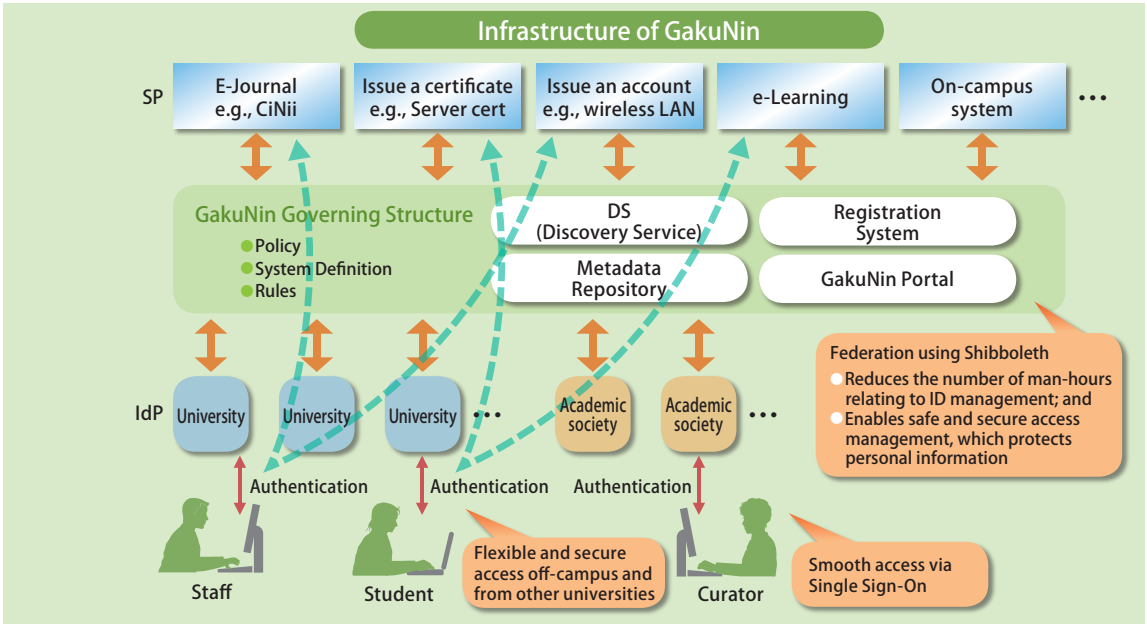
The Academic Access Management Federation in Japan is a federation consisting of universities, who are users of academic e-resources, and organizations like publishers, who are providers of such e-resources. By mutually trusting rules/policy stipulated by the Federation, organizations will be able to utilize federated access between each other.
Once the federated authentication is put into place, it will enable on-campus Single Sign-On (the mechanism where a single ID and password permit a user to access all systems). It will also create an environment where a user can access other university and commercial services using a single password and without the need to re-enter the ID or password. For example, a user can use another university's wireless LAN with the home university's ID and password, and seamlessly access e-journals that the home university subscribes to.

GakuNin

Features

- Joined by 61 identity providers (IdP) and 38 service providers (SP) (as of the end of March 2012)
- Only one ID/ password to remember.
- Single Sign-On(SSO).
- Accessible from anywhere in the world.
- Need no other software than a web browser.

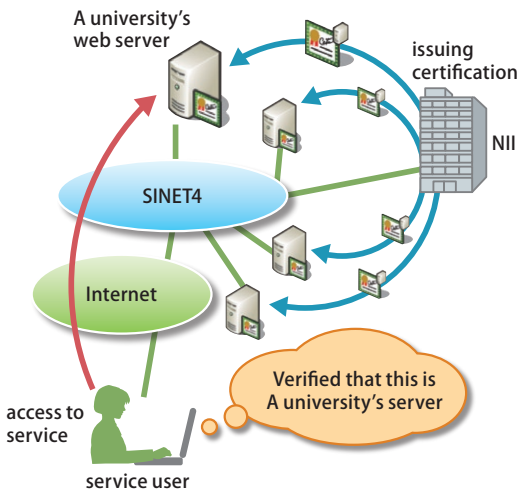
http://www.gakunin.jp/docs/en/fed



Issuing Server Certification

https://upki-portal.nii.ac.jp/

NII has issued highly secure server certification that meets the unified international WTCA (Web Trust for CA) standard for online servers connected to the academic information network (SINET).
Server certification certifies online server operators(domain names) and attempts to improve security such as making it easy to identify phishing sites.
It can also simultaneously realize online browsers and communication encoding between online servers, and also protect matters such as personal information that has been entered on online browsers.
Through the proliferation of server certification, NII is working to improve SINET's security.

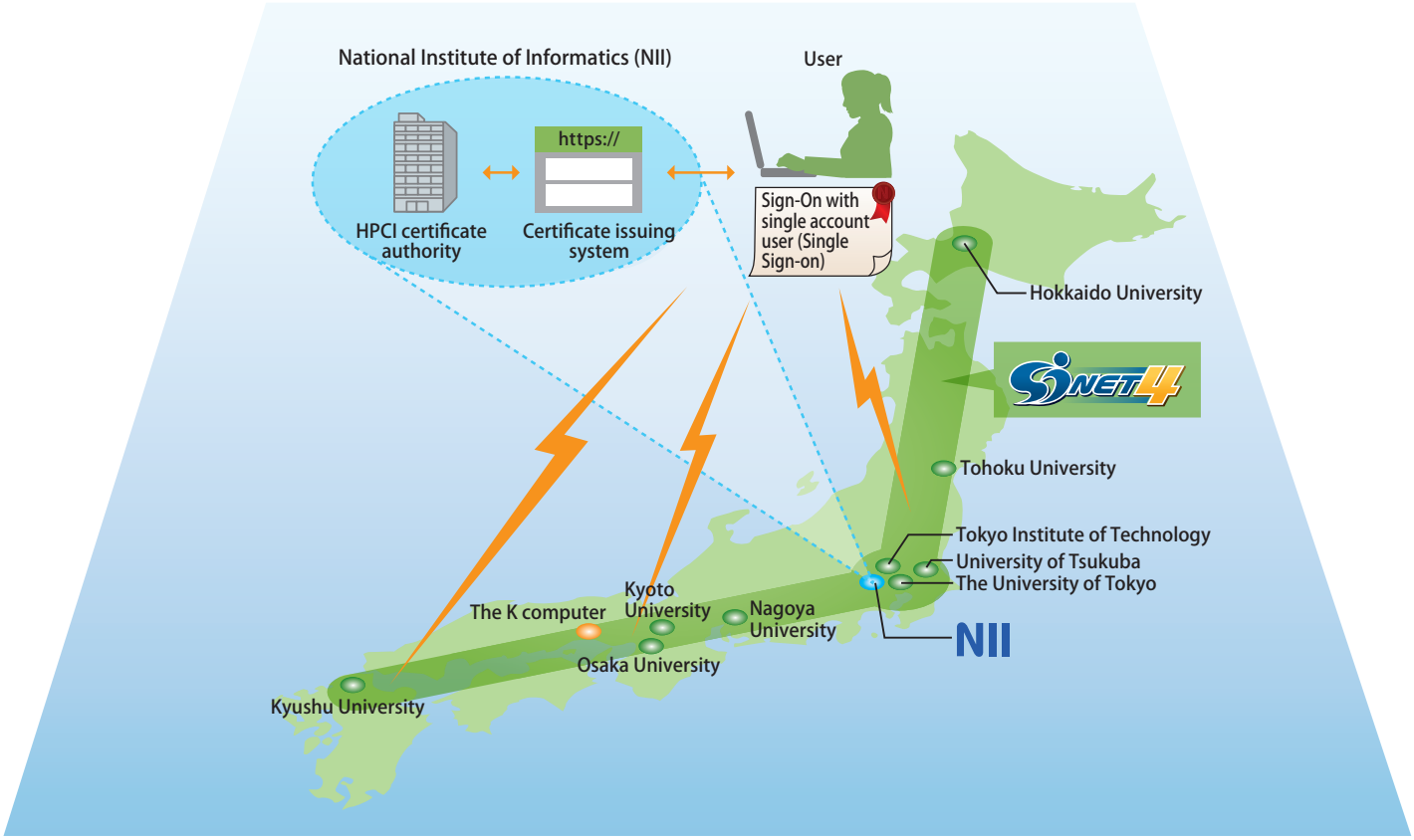


Server certification issuance situation
(as of March 2012)

Number of certificates issues	6,600
Number of institution such as universities	276 institution

Construction of the authentication infrastructure and network infrastructure for the High-Performance Computing Infrastructure (HPCI)

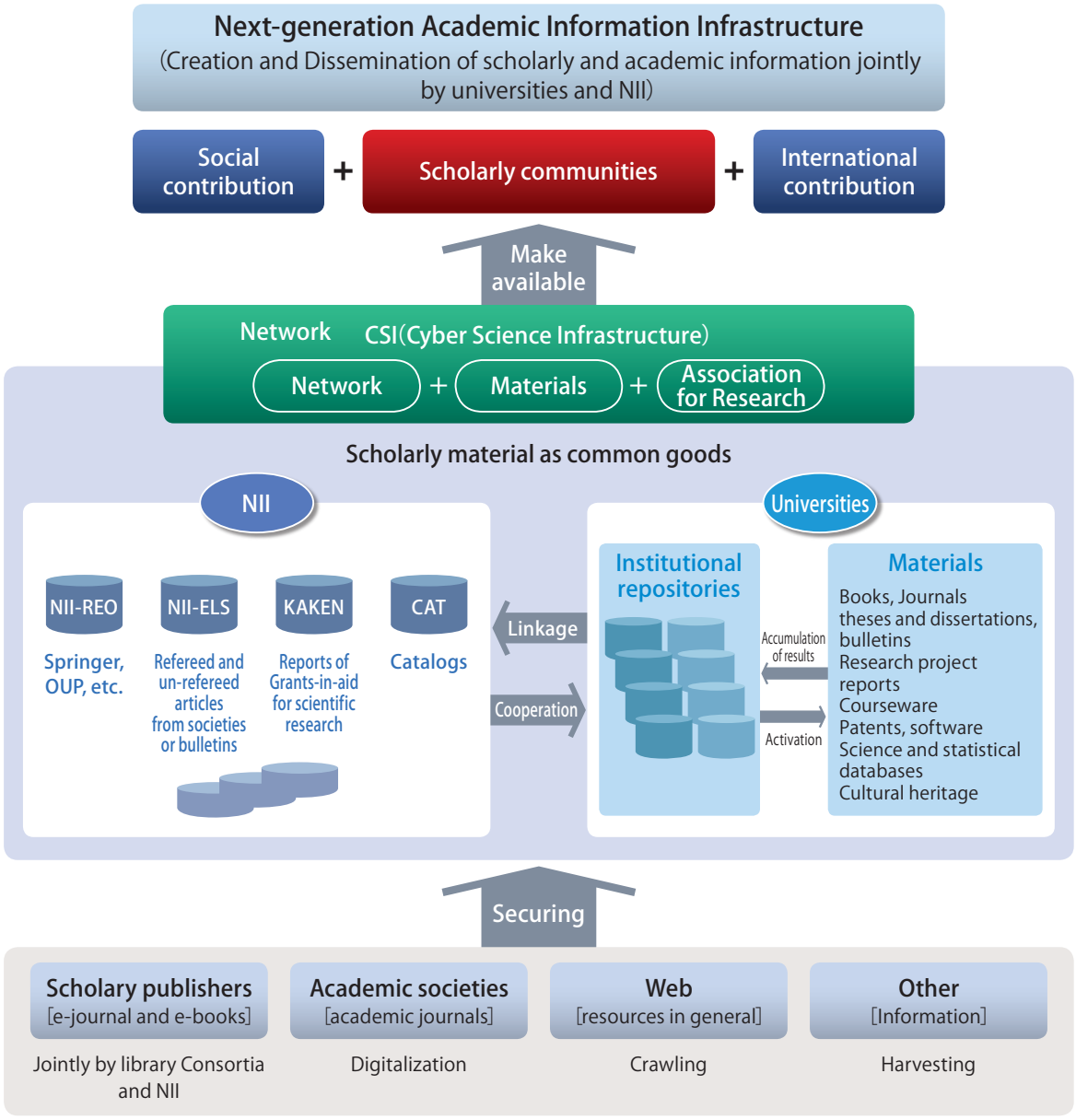
High Performance Computing Infrastructure (HPCI) aims to build computational environment, which meet the needs of various users in academics and industries, by federating the K computer in Kobe as a core system and supercomputers in universities and research institutes in Japan. The HPCI has an single sign-on authentication mechanism, which allows users to gain access to any computing resources by using a common login account to improve usability. NII is constructing and operating the certificate authority and the authentication portal, in collaboration with the K computer and universities, which is the core of the single sign-on authentication mechanism. A high-security mechanism based on electronic certificates is adopted to ensure security and reliability when using the HPCI. With these features, users access their accounts only once, get advantage of the HPCI in a reliable secure and convenient way. Additionally NII operates Science Information NETwork, SINET4. SINET4 provides network infrastructure in HPCI for using remote supercomputers and sharing large experimental data.



Establishment of Next-Generation Academic Information Infrastructure

http://www.nii.ac.jp/content/en/

Next-generation Academic Information Infrastructure is an important element of Cyber Science Infrastructure (CSI). It serves as an information platform that will secure Scholarly and Academic Information that is essential to the scholarly community while also ensuring its stable supply. At the same time, it collects and organizes the results of education and research that are produced at universities and research institutes, enhances their value, and disseminates them to society at large.



Support for Linkage between Institutional Repositories

http://www.nii.ac.jp/irp/en/

**Institutional repositories comprise a series of services provided by universities to members of their communities, in order to manage and transmit digital data created by universities and their members.
NII has conducted a collaborative program with universities to support the operation of institutional repositories. It involves the extension and integration of existing scholarly and academic information services at NII and the enhancement and improvement of information dissemination from universities.**

Activities

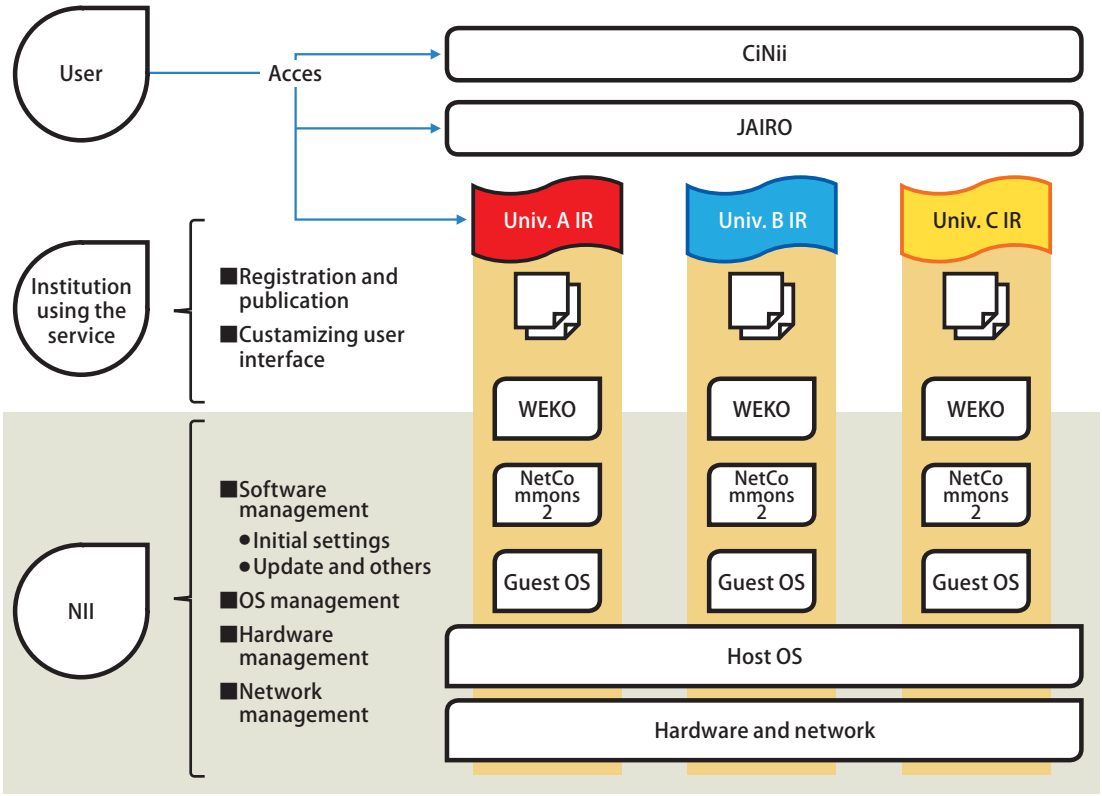
Since FY 2005, NII has entrusted to universities various tasks related to promoting the development of institutional repositories.
It also entrusts surveys and R&D for developing new services through collaboration between institutional repositories and improving their user-friendliness.
In addition to those entrusting projects, it supports universities and other academic institutions for content enhancement, system linkage and community formation.

Tasks entrusted	FY2006	FY2007	FY2008	FY2009	FY2010	FY2011
Area 1 (Development and operation of institutional repositories)	57 institutions	70 institutions	68 institutions	74 institutions	24 institutions	31 institutions
Area 2 (Advanced R&D)	22 projects	14 projects	21 projects	21 projects	8 projects	8 projects
Area 3 (Support for community activities)	—	—	—	—	5 projects	4 projects

JAIRO Cloud (shared repository service)

http://www.nii.ac.jp/irp/en/

For institutions that find it difficult to independently build and operate their own repositories, NII began hosting this shared repository system environment based on the institutional repository software "WEKO". NII will offer "JAIRO Cloud" preferentially to institutions that are newly building their own repositories to support their operations.



GeNii (NII Scholarly and Academic Information Portal)

http://ge.nii.ac.jp/genii/jsp/index-e.jsp

GeNii is a web-based service offering comprehensive scholarly and academic information created by NII in collaboration with university libraries, academic societies, and researchers.
Currently GeNii presents information in five major areas; (1) academic papers (CiNii), (2) books/journals (Webcat Plus), (3) research results (KAKEN), (4) specialized academic information (NII-DBR), and (5) institutional repositories (JAIRO). These areas feature individual search engines suited to the relevant content, while the GeNii Integrated Search System provides a tool for cross-referenced searching to help users quickly find the information they need.

CiNii (NII Scholarly and Academic Information Navigator)

http://ci.nii.ac.jp/en

This is a database service that can be exhaustively searched for academic information such as articles, books and journals. NII is expanding the pool of data available and improving text hit rates by linking various database services. In addition, NII is promoting intersystem links with university libraries and other facilities by providing search APIs(application program interfaces) such as OpenSearch.

CiNii Articles —Searching for Japanese research papers—

http://ci.nii.ac.jp/en

"CiNii Articles"enables you to search information on academic articles published in academic society journals, university research bulletins or articles included in the National Diet Library's Japanese Periodicals Index Database. It is available free of charge for anyone. In viewing paid content, special rates and other privileges are offered to institutional fixed-price users (registration by institution) or users with an ID (individual registration).

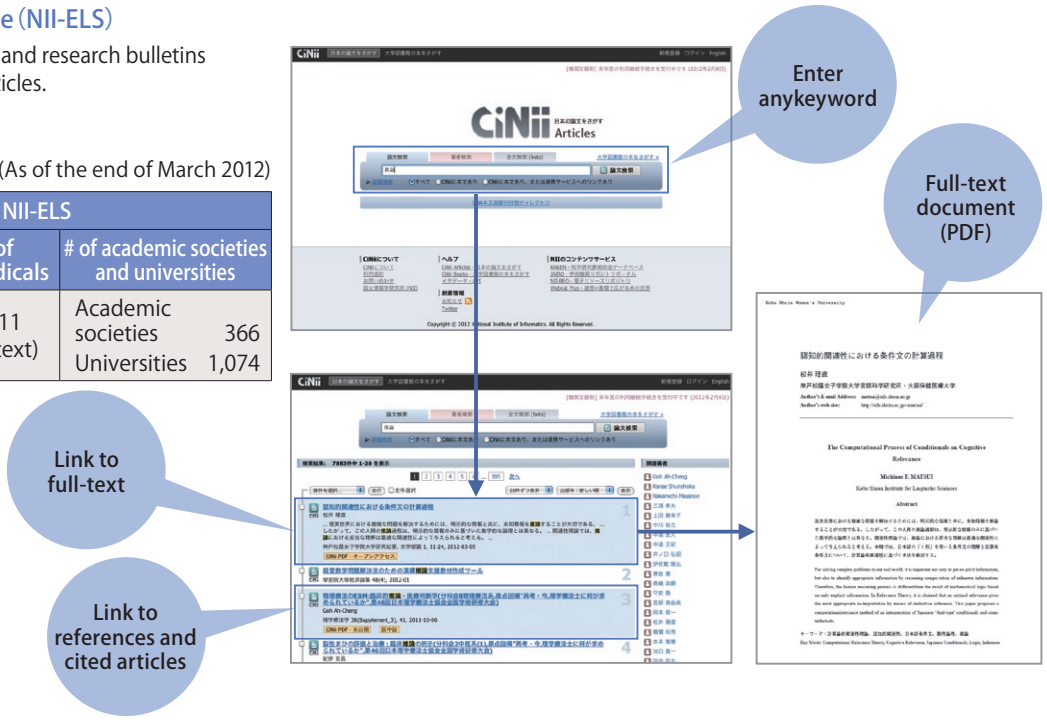
■NII Electronic Library Service (NII-ELS)

Offering texts in academic journals and research bulletins in electronic form through CiNii Articles.

Collection Status

(As of the end of March 2012)

# of article information	NII-ELS		
	# of full text documents	# of periodicals	# of academic societies and universities
15.3 million	3.8 million	4,611 (full text)	Academic societies 366 Universities 1,074



CiNii Books —Searching for books in university libraries—

http://ci.nii.ac.jp/books/?l=en

CiNii Books is a service that enables searching of information on books and journals that are held in university libraries in Japan.
It is possible to search for about 10 million titles held in 1200 university libraries (totaled over 100 million books), and about 1.5 million authors of these books that has been accumulated through the online cataloging system (NACSIS-CAT) which NII provides. It is available for anyone without registering.

Collection Status

(As of March 2012)

# of book and journal information	# of holding information	# of member libraries
10.1 million	115 million	1,262

KAKEN (Grants-in-Aid for Scientific Research)

http://kaken.nii.ac.jp/en/

This site presents a brief overview on themes (themes when initially ad-opted) and results (e.g., reports and reviews) of the research themesfunded by grants-in-aid for scientific research from the Ministry of Edu-cation, Culture, Sports, Science and Technology and the Japan Society for the Promotion of Science. Provides access to the latest scientific information in Japan. The research result report is available in a PDF file. (Since fiscal 2008)

Stored documents (as of March 2012)

Research themes
670,000

JAIRO (Institutional Repositories Portal)

http://jairo.nii.ac.jp/en/

This will enable crossover searches of academic information (research papers published in scholarly journals, academic dissertations, study reports, etc.) accumulated in institutional repositories in Japan.

Stored content (as of March 2012)

Institutional Repositories	Contents
200	1,300,000

NII-DBR (Academic Research Database Repository)

http://dbr.nii.ac.jp/

This site features specialized databases prepared by Japanese academic societies and research groups. Cross-searching of two or more databases is possible, in addition to the standard individual database search.

Stored databases (as of March 2012)

Databases	Contents
29	2,230,000

Webcat Plus

http://webcatplus.nii.ac.jp/

This aims to provide a knowledge base that can be freely searched for the accumulated knowledge and findings stored in the huge number of publications issued from the pre-Edo period to today. Integrating the holding lists of university libraries all over Japan as well as the National Diet Library; cover images of new publications; content databases; the stock lists of second-hand booksellers; e-book databases; and many other information sources for books, it provides information in a form organized by book, work, and author. It supports not only exact search but also a range of search options, including associative search and word search, which enables searching using indefinite elements, to help free-thinking users find books that interest them from more than 10 million publications.

Catalog Information Service

http://www.nii.ac.jp/CAT-ILL/en/

The Catalog Information Service consists of the Cataloging System and the Interlibrary Loan System (ILL).

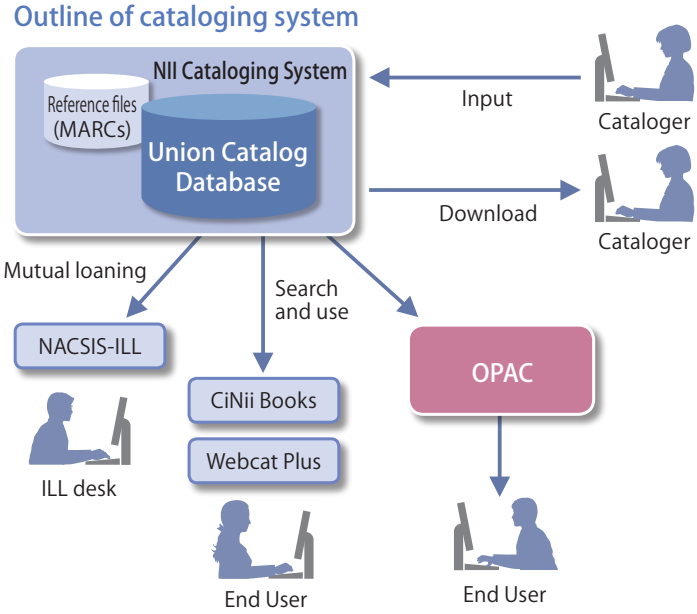
Cataloging System (NACSIS-CAT)

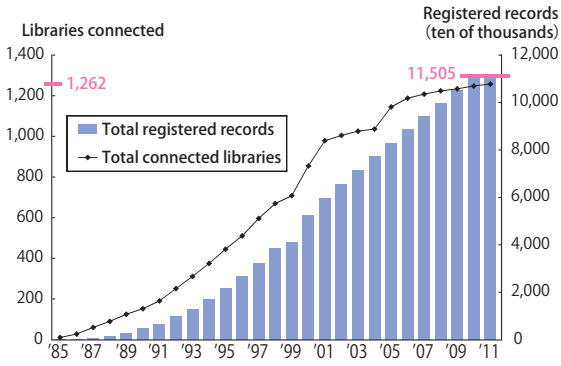
The NACSIS-CAT Cataloging System offers union catalog databases of academic documents (books and serials) held by university libraries and other such institutions throughout the country. These databases were compiled to support scholarly research and can be searched to determine instantly where specific materials are housed. To improve efficiency, standardized cataloging data (MARC) are referred to when constructing databases, and university libraries and other institutions share the work of inputting records online. The System also includes a function for referencing similar databases in other countries (OCLC in the USA, HBZ in Germany).
The union catalog of books and serials consisting of the compiled databases can be freely accessed via the worldwide web online search service (Webcat Plus).

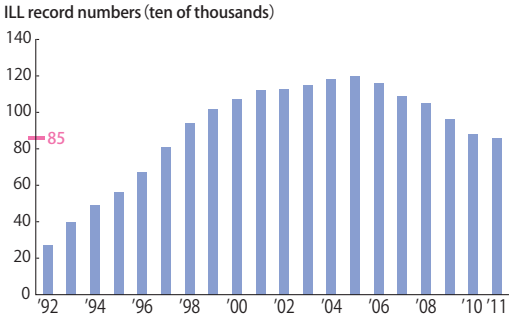
Interlibrary Loan System (NACSIS-ILL)

The Interlibrary Loan System (NACSIS-ILL) supports the exchange of books and serialized research dissertations among libraries to facilitate the provision of documents to researchers at universities and other institutions.
The service applies the latest information from the union catalog databases constructed by NACSIS-CAT, resulting in improved efficiency and prompt delivery of documents to users.
And may use the interlibrary loan service between overseas university libraries through collaboration with overseas ILL systems (such as the OCLC system in the US and KERIS in the Republic of Korea).
The efficiency of the system has been enhanced with an offsetting service for ILL document copying and other charges.

Outline of cataloging system







NII Repository of Electric Resources(NII-REO)

http://reo.nii.ac.jp/index_en.html

The NII Repository of Electronic Journal and Online Publications (NII-REO) archives the content of electronic journals and promotes their use as part of a joint effort with the University Library Consortia to ensure stable, sustainable access to electronic content.

Stored content (as of March 2012)

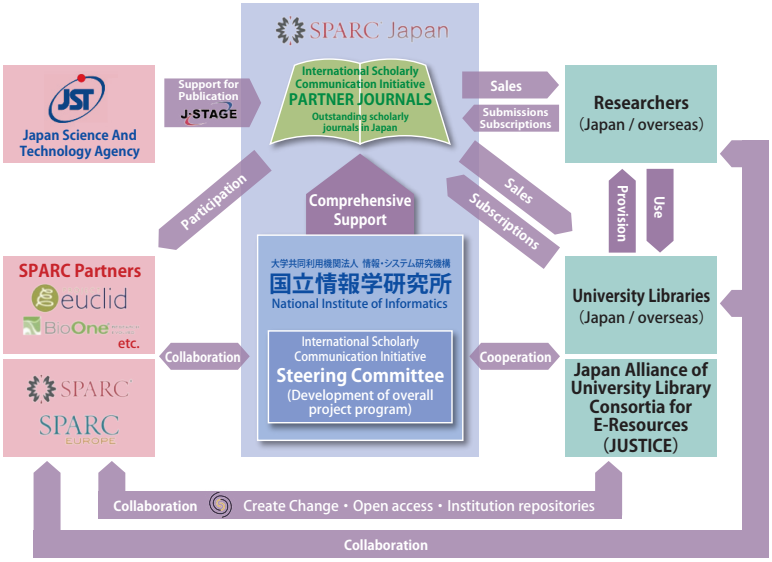
Publisher	Number of titles	Number of articles	Collecting year
IEEE Computer Society	about 30	about 350,000	1988-
Kluwer Online	about 800	about 350,000	1997-2005
Oxford University Press	about 200	about 860,000	1849-2003
Springer	about 1,100	about 2,090,000	1847-1996
House of Commons Parliamentary Papers(HCPP)		about 190,000	19、20世紀

International Scholarly Communication Initiative (SPARC Japan)

http://www.nii.ac.jp/sparc/en/

This project began in FY2003 for strengthening the electronic journals of the scholarly publications of Japan,s academic societies, with a view to keeping in the hands of Japanese researchers the outstanding research results that are currently published abroad and further promoting the international dissemination of research results. Academic journals published in Japan are earning great respect internationally. In collaboration with scholarly organizations, university libraries, SPARC (USA), and SPARC Europe, we are helping to establish a structure to ensure ongoing electronic publishing of these journals in a way that is economically feasible. In recent years, particularly, there have been positive initiatives in dissemination and advocacy activities as well as support for the creation of institutional repositories, with a view to establishing an "Open Access"model for barrierfree access to research results.

International Scholarly Communication Initiative



Education and Training Programs

http://www.nii.ac.jp/hrd/en/index-e.html

The National Institute of Informatics provides a range of training programs for university and other academic personnel responsible for scientific and academic information at universities and elsewhere.

User Training

NII offers database/operation training courses for those working in NACSIS-CAT/ILL services. Regional courses are also offered in conjunction with university libraries. NII also advances the development of selflearning materials that can be used on the web.

- **NACSIS-CAT Training Courses (Book course/Serial course)**
  This course provides the opportunity to learn the structure of NACSIS-CAT, its contents, data uploading methods (input standards), and operation rules.
- **NACSIS-ILL Training Course**
  This course provides the opportunity to learn the structure of NACSIS-ILL, its contents, and operation rules.

Advanced Training Programs

NII provides opportunities for academic research support staff at universities and research institutes to learn the latest in specialized and advanced technologies.

- **NACSIS-CAT/ILL Workshop**
- **Seminar for University Librarians**
- **NII Seminar**

Cooperation for User Training Sponsored by Universities

To support guidance and user training on NII services sponsored by universities and academic societies, NII offers a number of services, for example providing training texts or materials, curriculum advice, and assignment of user IDs.

Dissemination of Research Results

NII holds lectures and symposia and issues publications under the general aim of disseminating research finding on informatics widely throughout society, and informs details by NII's website and e-mail newsletter.

Open House

NII, a research institution, which is widely open to the public holds "Open House" two days once a year to present its activities and research results to the public as well as to researchers and Ph.D. candidates.

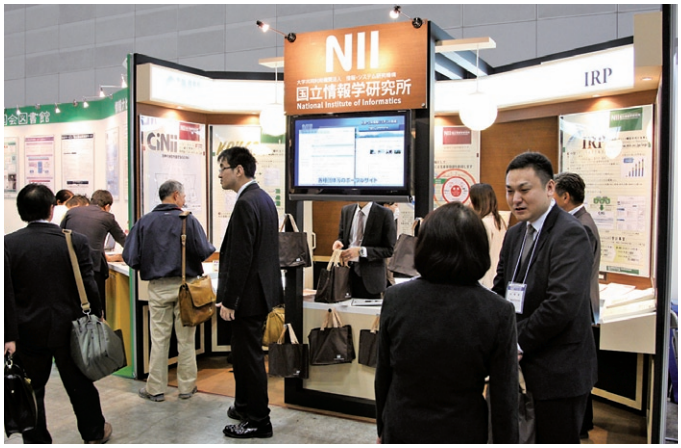
NII Open House (June, 2011)

Symposia and Study Meetings

NII announces results of research and communicates information by holding symposia and workshops addressing research subjects and the latest issues in informatics from broad-ranging perspectives, welcoming researchers from the front lines of the field in Japan and around the world.

Exhibitions

NII attempts to disseminate its research results and promote its information service through presentations in various exhibitions.



Library Fair & Forum (November, 2011)

Open Lectures and Seminars

NII also holds open lectures and seminars.

NII Public Lectures

NII researchers have held public lectures on a wide range of themes related to informatics - a total of eight per year, with no more than one held in any given month - at the National Center of Science in Hitotsubashi, Chiyoda Ward, Tokyo. Some content from past lectures has been made available to the public as streaming media from the NII website. * in Japanese

NII Public Lectures February, 2012)

Karuizawa Saturday Salon

The NII hosts seminars on issues and topics related to informatics for both researchers and the general public several times a year at the International Seminar House for Advanced Studies (Inose lodge: Karuizawa, Nagano Prefecture).

- Videos of lectures and recitals are available on the NII website * in Japanese
- Publication of Karuizawa Doyo-Konwakai Koenshu:Chi to Bi no harmony ("Collection of Lectures from the Karuizawa Saturday Salon: Harmony of Intelligence and beauty") * in Japanese

Karuizawa Saturday Salon (November, 2011)

Publications

●NII Series (Maruzen Library)

This series of commercial books introduces and describes the details of NII research using familiar examples that are easily understood by the general public. * in Japanese

NII Series (Maruzen Library)

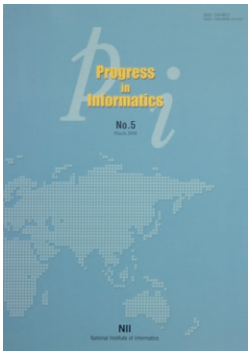
●NII Technical Report

NII Technical Reports are issued as individual publications such as research papers, reference materials, and manuals covering the results of NII research, to serve generally as updates on the NII's research activities. These reports are available through the NII website.

NII Technical Report

●Progress in Informatics

Progress in Informatics is an international peer-reviewed journal published by the NII, aiming at the promotion of research and development in the broad area of informatics. The journal provides the international academic community with a venue for discussion and a means of exchanging information covering a wide range of fields involving informatics applications. The published articles consist not only of original research papers but also of surveys and project reports which contribute internationally to the progress of research and development. We ask for submissions for articles all the time.



Progress in Informatics

Public information magazine

- ●NII Today (Japanese/English)
- ●Catalogue of NII (Japanese/English)
- ●Outline of NII (Japanese/English)
- ●Annual Report (Japanese)

NII Today (Quarterly)

WEB

●**NII Website** http://www.nii.ac.jp/en/

Please access to our website for further information

●**iTunes U®** http://www.nii.ac.jp/event/itunesu/

Lectures delivered in NII Public Lectures and symposia are available to the public on the global open courseware platform of iTunes U®.

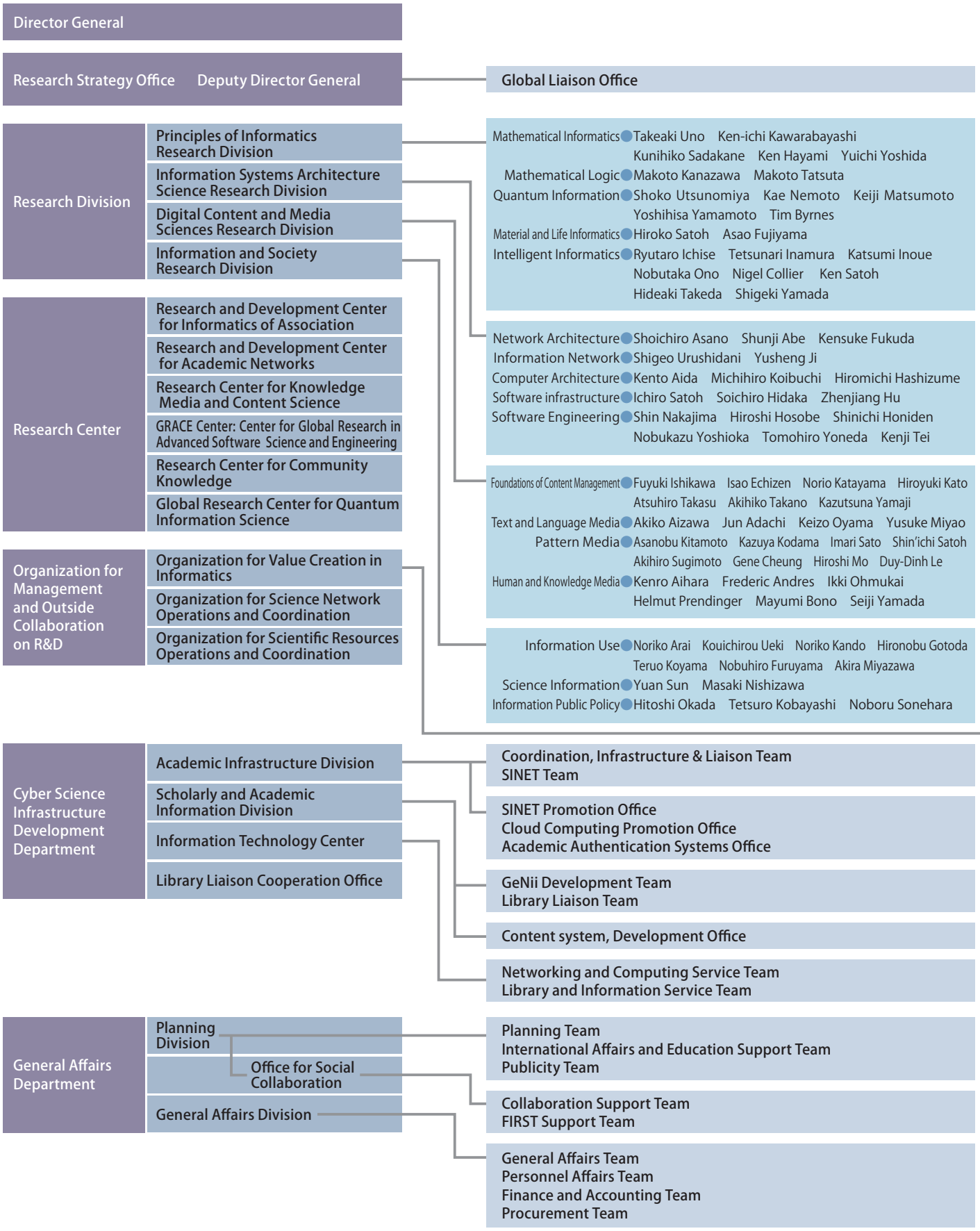
●**Twitter** http://twitter.com/jouhouken/

@jouhouken official account

Organization / Staff / Budget

Organization Chart

(as of April 2012)



Visiting Professor ●

[Management and Outside Collaboration on R&D]

Henri Angelino (Full-time)
Michael E Houle (Full-time)
Kiyoshi Agusa Satoshi Akutsu
Hideharu Amano Keijiro Araki
Hiroki Arimura Yoshiaki Fukazawa
Teruo Higashino Takeo Igarashi
Katsushi Ikeuchi Katsuro Inoue
Kentaro Inui Toru Ishida
Hiroshi Ishiguro Kunio Kashino
Masaru Kitsuregawa Jiro Kokuryo
Yasuo Kuniyoshi Shu Kuramoto
Sadao Kurohashi Masao Kuwahara
Hideo Matsuda
Yasuyuki Matsushita
Teruko Mitamura
Kazuaki Murakami
Yuichi Nakamura Yutaka Osawa
Mizuhito Ogawa
Hisamichi Okamura
Yoshiyasu Okuhara
Manabu Okumura
Masanao Ozawa
Motoshi Saeki Ryoichi Sasaki
Yoichi Sato Sumio Sugano
Masaaki Sugihara Koichi Takeda
Yasuo Tan Yuzuru Tanaka
Yoshiaki Tanaka Satoshi Tojo
Junichi Tsujii Kazunori Ueda
Hitohide Usami Hayato Yamana
Hiroshi Yasuda
Yoshinori Yokoyama
Naoki Yonezaki Shoji Yuen
Katsuya Watanabe
Shinichi Watanabe
A Min Tjoa Alex Hauptmann
Jennifer Marjorie Corbett
Artur Ekert Anthony Finkelstein
Douglas William Oard
Frederic Benhamou
Muller Gunter Fu Qiang Liu
Mark Andrew Sanderson
Hong Mei Gerald Milburn
Bashar Nuseibeh Antonio Ortega
Kai Rannenberg
Joerg Schmiedmayer
Amal El Fallah Seghrouchni
Sebastian Uchitel Hlavac, Vaclav
Vincent Oria William John Munro

(Visiting Associate Professor)
Daisuke Bekki Takahiro Hara
Haruhiko Kaiya Hideo Joho
Takashi Koga Yuzo Marukawa
Yutaka Matsuo Tsuyoshi Murata
Takeshi Naemura Hiroaki Nishi
Yuko Noguchi Shingo Oue
Eiji Oki Kenjiro Taura
Kazushige Terui
Hironori Washizaki
Youdai Watanabe
Andrei Doncescu Jin Song Dong

(Visiting Assistant Professor)
Masashi Inoue

[Promoting Cooperation with Society and Industry]

(Visiting Professor)
Akihiro Hada Takashi Hanazawa
Takashi Hotta Shinichi Iwasaki
Mitsuo Kawato Tsuyoshi Kitani
Akira Maeda Ko Miyake
Toshinori Odaka
Nobuyuki Osakabe
Madoka Tsuchiya Sanya Uehara
Shiro Usui

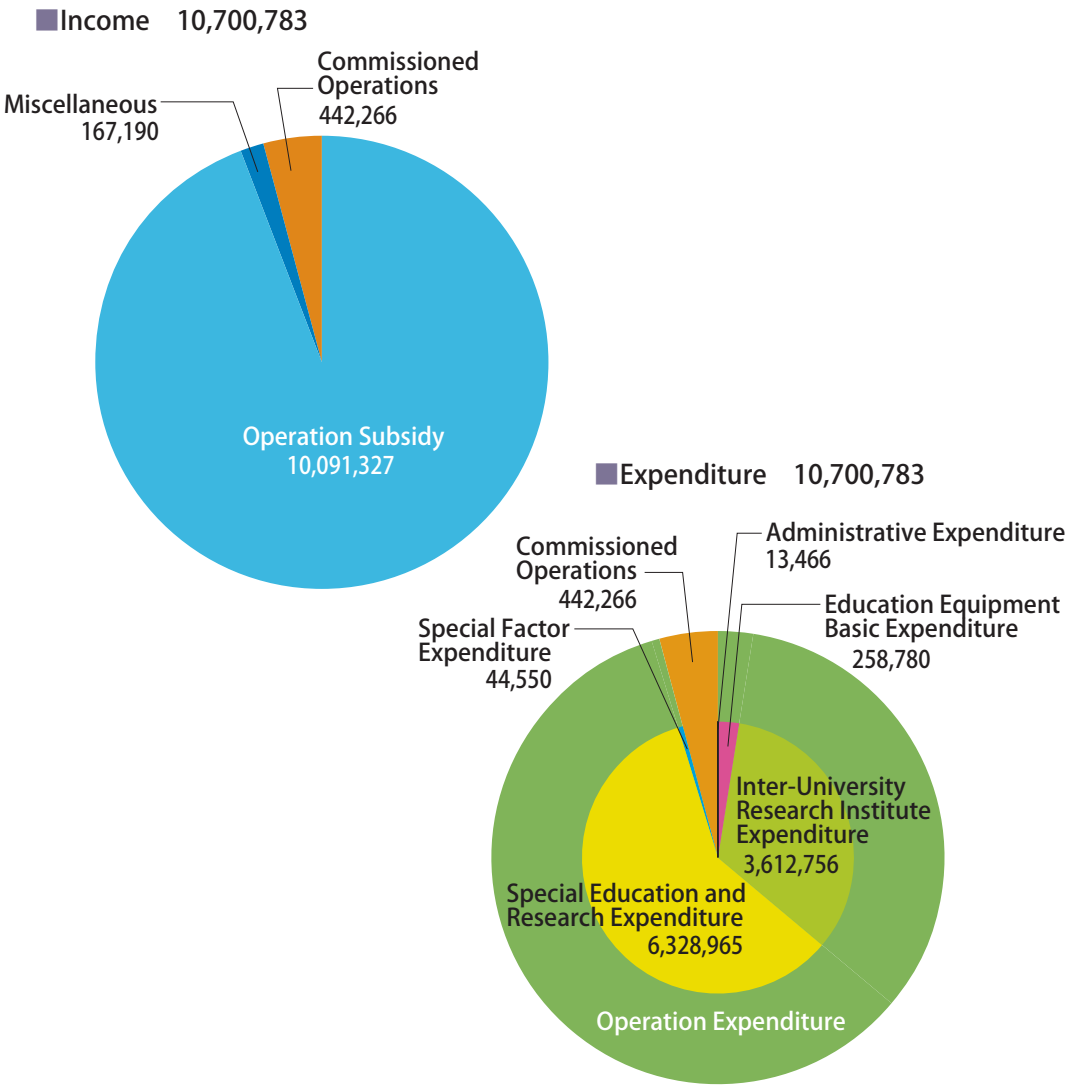
Staff

(as of April 2012)

		Director General	Deputy Director General	Professors	Associate Professors	Assistant Professors	Assistant	Subtotal	Other Employees	Total
Full-time Employees		1	2	32	32	10		77	50	127
# of Visiting Professors Organization for Management and Outside Collaboration R&D	Management and Outside Collaboration on R&D			72	21	1		94		94
	Promoting Cooperation with Society and Industry			13				13		13
Specially Appointed Professors etc. (Project-based)				11	5	5	1	22		22
Support Staff										214
Graduate Students										126

Budget (FY2012)

(unit: thousand yen)



(as of April 1, 2012)

Administrative Council

Members advise the Director General regarding plans for NII projects and other important matters related to management and operations.

Setsuo Arikawa	President, Kyushu University
Haruhisa Ichikawa	Professor, The Department of Human Communication, The University of Electro-Communications
Masaru Kitsuregawa	Director, Center for Information Fusion, Institute of Industrial Science, the University of Tokyo
Shinji Shimojo	Professor, Cybermedia Center, Osaka University
Hidehiko Tanaka	President, Institute of information Security
Toyoaki Nishida	Professor, Department of Intelligence Science and Technology, Graduate School of Informatics, Kyoto University
Sadaoki Furui	Professor emeritus, Tokyo Institute of Technology
Yoichi Muraoka	Professor, Department of Computer Science and Engineering, Waseda University
Miwako Doi	Senior Fellow, Corporate Research & Development Center, TOSHIBA Corporation
Mario Tokoro	Chairman & CEO, Sony Computer Science Laboratories, Inc.

Shinichi Honiden	Deputy Director General, NII
Jun Adachi	Deputy Director General, NII
Shigeki Yamada	Director, Principles of Informatics Research Division, NII
Keizo Oyama	Director, Digital Content and Media Sciences Research Division, NII
Noboru Sonehara	Director, Information and Society Research Division, NII
Akihiko Takano	Director, Research and Development Center for Informatics of Association, NII
Shigeo Urushidani	Director, Research and Development Center for Academic Networks, NII
Akiko Aizawa	Director, Research Center for Knowledge Media and Content Science
Noriko Arai	Director, Research Center for Community Knowledge
Yoshihisa Yamamoto	Director, Grobal Research Center for Quantum Information Science
Atsuhiro Takasu	Head, Department of Informatics, School of Multidisciplinary Sciences, The Graduate University for Advanced Studies

Advisory Board

Advisory Council for Research and Management Members provide advice and suggestions to the Director General regarding joint research programs and other important matters related to the operation of NII, in response to requests from the Director General.

Masanori Aoyagi	Director of the National Museum of Western Art
Setsuo Arikawa	President, Kyushu University
Kazuo Iwano	Advisor, Business Service Group, Mitsubishi Corporation
Hideko Kunii	Chairpeson of Ricoh IT Solutions Co., Ltd.
Keiichi Kubota	Director General, NHK Science & Technical Research Laboratories
Hiromichi Shinohara	Director and Senior Vice President, Director of Research and Development Planning Department, NTT (Nippon Telegraph and Telephone) Corporation
Makoto Nagao	Former Librarian of the National Diet Library
Hideyuki Nakashima	President, Future University Hakodate
Shojiro Nishio	Professor, Graduate School of Osaka University
Masafumi Maeda	Managing Director, Executive, Vice President, the University of Tokyo
Hideo Miyahara	President, National Institute of Information and Communications Technology
Teruyasu Murakami	Director, Research Institute for Industrial Strategy
Yoichiro Murakami	President, Toyo Eiwa Jogakuin

Bob Williamson	Scientific Director, NICTA(National ICT Australia)
Gerard van Oortmerssen	Professor, Tilburg University
Jeff Kramer	Senior Dean, Imperial College London
Marek Rusinkiewicz	Vice President and General Manager, Information and Computer Sciences Research Laboratory at Telcordia Technologies
Michael A. Keller	Director, Ida M. Green University Librarian, Director of Academic Information Resources, Publisher of HighWire Press, and Publisher of the Stanford University Press
Michel Cosnard	Chairman & CEO, INRIA(Institut National de Recherche en Informatique et en Automatique)
Nelson Morgan	Deputy Director, ICSI (International Computer Science Institute)
Tamer Öszu	University Research Chair, David R. Cheriton School of Computer Science, University of Waterloo
Wolfgang Wahlster	Director and CEO, DFKI(German Research Center for Artificial Intelligence)
Yanghee Choi	Director, Multimedia and Mobile Communications Laboratory, School of Computer Science and Engineering Seoul National University
Yi Zhang	Vice Provost, International Affairs Office of International Cooperation and Exchange, Tsinghua University
Takeo Kanade	Professor, The Robotics Institute, Carnegie Mellon University
Thaweesak Koanantakool	President, NSTDA(National Science and Technology Development Agency)

Professors Emeriti (NACSIS: National Center for Science Information Systems)

Kimio Ohno	Former Deputy Director General, NACSIS, Professor Emeritus, Hokkaido University
Atsunobu Ichikawa	Professor Emeritus, Tokyo Institute of Technology

Tatsuo Nishida	Former Deputy Director General, NACSIS, Professor Emeritus, Kyoto University
Hitoshi Inoue	Former Deputy Director General, NACSIS

Professors Emeriti (NII : National Institute of Informatics)

Takamitsu Sawa	Former Deputy Director General, NII, President, Shiga University
Eisuke Naito	Former Professor, Human and Societal Information Research Division
Mitsutoshi Hatori	Former Professor, Multimedia Information Research Division, NII, Professor Emeritus, Tokyo University
Kinji Ono	Former Professor, Information Foundation Research Division
Takeo Yamamoto	Former Professor, Multimedia Information Research Division, NII, Professor Emeritus, University of Library and Information Science

Yasuharu Suematsu	Former Director General, NII, Professor Emeritus, Tokyo Institute of Technology
Haruki Ueno	Former Professor, Principles of Informatics Research Division, NII
Katsumi Maruyama	Former Professor, Information Systems Architecture Research Division, NII
Masamitsu Negishi	Former Professor, Information and Society Research Division, NII
Kenichi Miura	Former Professor, Information Systems Architecture Research Division, NII Director, Center for Grid Research and Development
Yohichi Tohkura	Former Director General, NII

History

1973	October	Ministry of Education, Science, Sports and Culture proposes an "Improved Circulation System for Academic Information" in the Third Report (Basic Policies for the Promotion of Scholarship) of the Science Council.
1976	May	Research Center for Library and Information Science (RCLIS) is established at the University of Tokyo.
1978	November	"A New Plan for Academic Information Systems" is presented to the Science Council by the Minister of Education, Science, Sports and Culture. The Science Council issues a response in January 1980.
1983	April	Center for Bibliographic Information is established at the University of Tokyo, with the reorganization of the Research Center for Information and Library Science.
1984	December	The NACSIS-CAT catalog information service is launched.
1986	April	National Center for Science Information Systems (NACSIS) is established, with the reorganization of the Center for Bibliographic Information, the University of Tokyo.
1987	April	The Science Information Network (SINET) is launched.
	April	The NACSIS-IR information search service is launched.
1994	November	Chiba Annex (Inage-ku, Chiba City) is built
1997	March	International Seminar House for Advanced Studies, Inose Lodge (Karuizawa, Nagano Prefecture) is established.
	December	An Advisory Panel on a Core Institution for Scientific Research in the Information Field is established by the Ministry of Education, Science, Sports and Culture.
1998	January	A proposal entitled "Promoting Computer Science Reseach" is published by the Science Council of Japan, calling for the establishment of a core institution for inter-university research in informatics.
	March	Advisory Panel on a Core Institution for Scientific Research in the Information Field issues its report.
	April	Coordination Office is established for the Core Institution for Scientific Research in the Information Field; committee is formed in May.
1999	March	Coordinating Committee of the Core Institution for Scientific Research in the Information Field issues its report.
	April	Preparatory Office is established for the Core Institution for Scientific Research in the Information Field; committee is formed in May.
	July	Preparatory Committee of the Core Institution for Scientific Research in the Information Field issues its interim report.
2000	March	Preparatory Committee of the Core Institution for Scientific Research in the Information Field issues its final report.
	February	Operations move to a building in the National Center of Sciences (Hitotsubashi, Chiyoda-ku, Tokyo).
	April	National Institute of Informatics (NII) is established, with the reorganization of NACSIS and assumption of its functions.
2002	April	Ph.D. Program in Informatics is established in the Department of Informatics, Graduate University for Advanced Studies.
	September	Research Planning and Promotion Strategy Office is founded.
	October	International Course is established within Ph.D. Program in Informatics.
2003	January	Global Liaison Office is formed.
	April	Initiation of Project to Improve Infrastructure for International Circulation of Scholarly Information.
2004	April	NII begins a new chapter as a member of the new Inter-University Research Institute Corporation / Research Organization of Information and Systems.
2005	February	Organization for management and Outside Collabration on Science Information Network
	April	The official service of GeNii (NII Academic Contents Portal) is launched.
2007	April	The Planning and Promotion Strategy Department is established.
	June	Science Information Network (SINET3) is launched.
2009	April	NII Scholarly and Academic Information Navigator (CiNii) and the KAKEN database of grants-in-aid for scientific research are revamped. Japanese Institutional Repositories Online (JAIRO) is officially launched.
	June	The Academic Information Infrastructure Open Forum is established.
2010	February	The first NII Shonan Meeting takes place.
2011	April	Science Information Network (SINET4) is launched.
	April	The Library Liaison Office is established.
	November	CiNii Books is launched.

Facilities / Location

National Center of Sciences

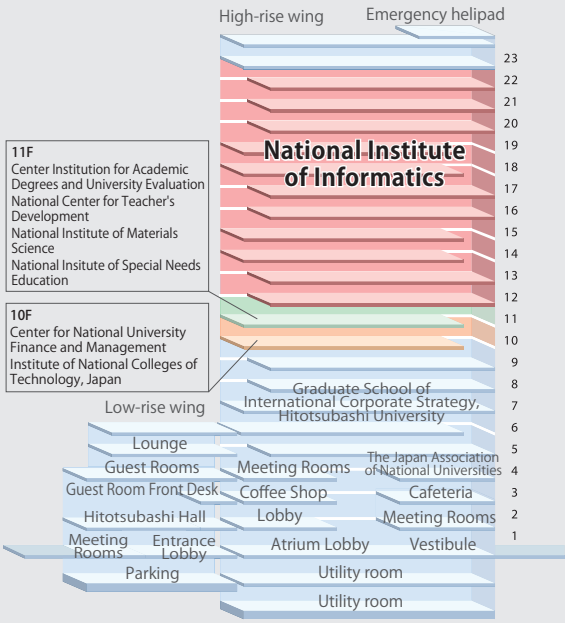
The National Center of Sciences was established as a center for scientific research in informatics, for academic exchanges, for the dissemination of scientific information, and to provide to society as a whole the benefits of an infrastructure of academic research in Japan. Construction was completed in December 1999. The Center consists of three principal institutions: the NII, the Hitotsubashi University Graduate School of International Corporate Strategy, and the Center for University Finance. The Center aims to provide a developed base for intellectual creativity through the comprehensive application of the academic functions of each institute. Conference facilities are located in the lower floor of the building, including the Hitotsubashi Hall. These are available for use for various activities, such as international conferences, lectures, and other academic meetings organized by national universities.

National Center of Sciences

National Institute of Informatics (NII)

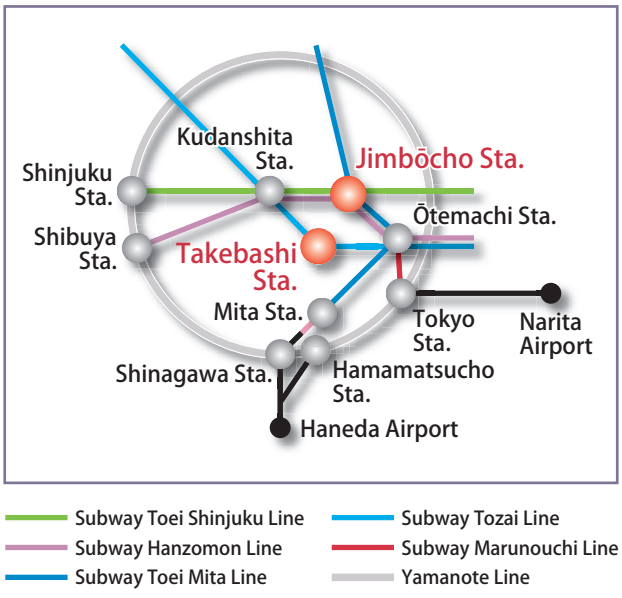
http://www.nii.ac.jp/en/

National Center of Sciences Bldg. 2-1-2
Hitotsubashi, Chiyoda-ku, Tokyo 101-8430
TEL: +81-3-4212-2000 (Exchange)



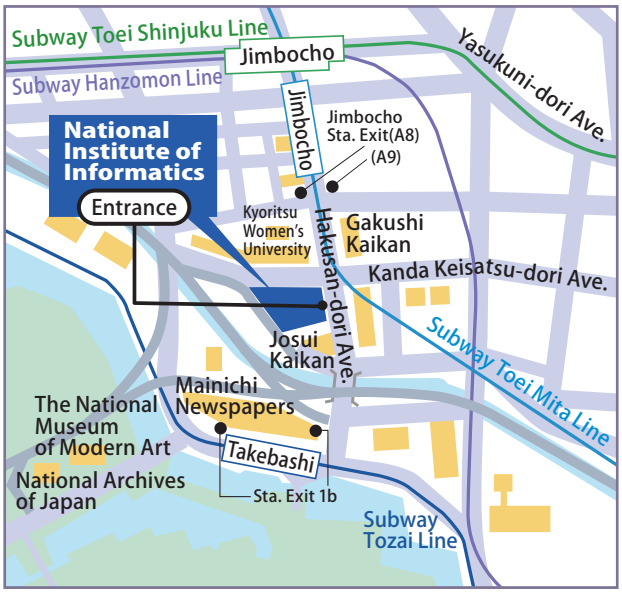
National Institute of Informatics
Site area : 6,842㎡ (Occupied by NII : 3,036㎡
Floor space : 40,585㎡ (Occupied by NII : 18,145㎡

Route Map



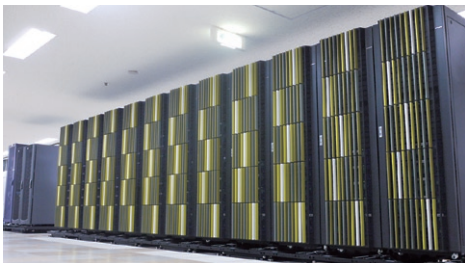
Subway Toei Shinjuku Line
Subway Hanzomon Line
Subway Toei Mita Line
Subway Tozai Line
Subway Marunouchi Line
Yamanote Line

Guide Map



Chiba Annex (Inage-ku, Chiba City)

The Chiba Annex is a facility for computer systems and networking equipment used to operate the Science Information System and to provide scientific information services. It was built in November 1994 and is located in the Chiba Experiment Station of the Institute of Industrial Science of the University of Tokyo.



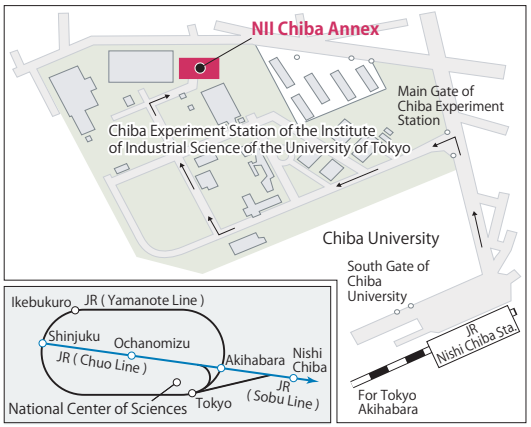
Server of Chiba Annex

Facade of Chiba Annex

Chiba Annex

1-8 Yayoi-cho, Inage-ku, Chiba-shi, Chiba
263-0022
TEL: +81-43-285-4911 (Exchange)

Guide Map



Site area (rented) : 1,782㎡
Floor space : 3,943㎡

International Seminar House for Advanced Studies Inose Lodge (Karuizawa, Nagano Prefecture)

The International Seminar House for Advanced Studies, or Inose Lodge, was built on land donated by Dr. Hiroshi Inose, the first director general of NII. His idea was to create an ideal place for interdisciplinary and international discussions.

Uses

1) Domestic and international academic conferences, seminars, etc.
2) Public lectures and social gatherings, etc.
3) Research and training of NII researchers and staff.

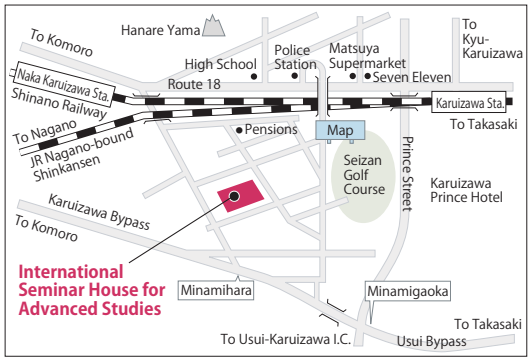
Facade of Seminar House

International Seminar House for Advanced Studies Inose Lodge

http://www.nii.ac.jp/access/karuizawa/

1052-471, Okan Minamihara Nagakura, Karuizawa, Karuizawa-cho, Kita Saku-gun, Nagano 389-0111
TEL: +81-267-41-1083 FAX: +81-267-41-1075

Guide Map



Site area : 3,339㎡
Floor space : 667㎡

Contact info for inquiries

Page	Contents	Contact	E-mail	TEL	FAX
p.15	Research Cooperation	Planning Division, Office Social Collaboration, Collaboration Support Team	kaken@nii.ac.jp	03-4212-2170	03-4212-2150
p.16	Intellectual Properties	Planning Division, Office Social Collaboration, Collaboration Support Team	chizai_web@nii.ac.jp	03-4212-2170	03-4212-2150
p.17	Top SE and edubase : Education Services for IT specialists	Research Center, GRACE Center: Center for Global Research in Advanced Software Science and Engineering	edubase@grace-center.jp	03-4212-2830	03-4212-2697
p.18	Graduate Education Activities	Planning Division, International Affairs and Education Support Team	daigakuin@nii.ac.jp	03-4212-2110	-
p.20	NII Library	Information Technology Center, Library and Information Service Team	library@nii.ac.jp	03-4212-2140	03-4212-2120
p.21	International Exchange (MOU/JFLI)	Planning Division, International Affairs and Education Support Team	international@nii.ac.jp	03-4212-2165	03-4212-2150
p.22	International Exchange (Shonan Meeting)	NII Shonan Meeting Administrative Office	shonan@nii.ac.jp		
p.25	Cyber Science Infrastructure (CSI)	Academic Infrastructure Division, Coordination, Infrastructure & Liaison Team	plan@nii.ac.jp	03-4212-2215	03-4212-2230
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