## Inter-University Research Institute Corporation 2013 Inter-University Research Organization of Information and Systems 2013 National Institute of Informatics 2013

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### Introduction

Since April 1st, I have been assigned to Director General, National Institute of Informatics.

As Japan's only comprehensive academic research institute in the field of informatics, the National Institute of Informatics (NII) has a mission of promoting basic research in informatics from a long-term perspective together with practical research designed to solve issues that confront society. This research is developed in one of the 4 research divisions: Principles of Informatics, Information Systems Architecture Science, Digital Content and Media Sciences or Information and Society. Moreover as an inter-university institution the NII is the leader/coordinator of different national projects including researchers from other Japanese universities or industry e.g. "Quantum Information Science" or "Big Data Mathematics" or "Cyber Physical Systems".

On the other hand as part of an Inter-University Research Institute, the NII also has the missions of operating a network (SINET4) linking universities and research institutes, creating an academic information infrastructure necessary for research and educational activities in the academic community, providing academic content and service platforms and, through those activities, it is a very important mission to develop human resources and making social and international contributions.

There are few institutions anywhere in the world that conduct research in informatics and simultaneously provide IT services and a network. We believe that operating our own systems and concentrating on the field of informatics, which is developing at a furious speed, are the best ways to stay on top of trends in IT and contribute to create cutting-edge information services with universities. Academic information infrastructure is indispensible to all academic disciplines. The NII aspires to help academia achieve breakthroughs by providing robust information infrastructure for researchers across a range of disciplines.

Under Former Director General Masao Sakauchi, the NII and its Cyber Science Infrastructure(CSI) have achieved significant development. We believe that ICT is widely recognized as the core enabler for scientific findings and social innovation. In the United States, the IT sector has accounted for 25% of economic growth since 1995, and the basic research that supports the industry plays a considerable role. While it is a traditional picture that new technologies generate services, the creation of non-conventional information and communication technology is being driven by new, idea-driven services. In these circumstances in this century, we will redouble our efforts to create a more flexible academic research system.

Until now the NII has benefited from understanding and support of many national and international partners, I hope that all of them will continue to help me to promote the NII as one of the worldwide reference institution in Informatics.

April 2013 Director General, National Institute of Informatics

#### Masaru Kitsuregawa

#### Inter-University Research Institutes

Inter-University Research Institute Corporations are Japanese research institutes that facilitate joint university research. As research institutes that cover a range of fields and can be used by all universities, the Inter-University Research Institute Corporations provide free of charge to researchers nationwide the kind of large, cutting-edge equipment, tremendous volumes of academic data, high-value data, and analytical procedures that individual universities would have difficulty maintaining.

The National Institute of Informatics was established in 2000 and was incorporated into the Research Organization of Information and Systems, an Inter-University Research Institute Corporation, in 2004.

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### **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, versity research institute, NII promotes the creation of a state-of-the-art academic-inbroader academic community, with a focus on partnerships and other joint efforts



#### 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, seven 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.



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.



#### 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-uni-formation infrastructure (the Cyber Science Infrastructure, or CSI) that is essential to research and education within the 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 and the society.

#### 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



#### 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.

### **Research**

### **Principles of Informatics Research Division**

We conduct research aimed at establishing new principles and theories in informatics, and opening up new fields of study

| Successful tests on quantum-dot spin-photon entanglement                                | Vaah ihia |            |
|---|-----------|------------|
| Progress towards creating a quantum repeater system using optical semiconductor devices | rosninis  | a ramamoto |

There are high hopes for quantum cryptography and other forms of quantum communication technology, as a secure means of communication offering advanced functionality. Even if a sufficiently high-performance computer, such as a quantum computer, were to be developed in the future, communications would never be intercepted. As it stands however, the transmission distance for quantum encrypted communication is limited to around 100km, due to light loss from optical fibers. To create a quantum communication network capable of covering all of Japan, or even the entire world, we therefore need to develop a technology known as "quantum repeater".

Quantum repeater systems are made up of quantum memory, assigned to individual nodes, and optical transmission lines between the nodes. Spin data contained within quantum memory is carried along the optical transmission lines by photons. When this happens, "quantum entanglement" occurs between each spin and photon. This is essential in order to make quantum repeater systems a reality. Our research team has been focusing on a technique that uses electron spin within semiconductor quantum dots as quantum memory. We have achieved considerable results to date, including the generation of single photons from quantum dots (Physical Review Letters, 2000), indistinguishable photon-photon collision experiments (Nature, 2002), ultrafast control of electron spin in quantum dots using optical pulses (Nature, 2008), and wide-range control of electron spin decoherence (Nature Photonics, 2010).

Having converted the wavelength of a single photon generated from a quantum dot from 910nm to 1.56 microns, we have now developed technology capable of detecting the resulting light at ultrafast speeds. As a result, we have successfully produced quantum entanglement between electron spin and photon. We have achieved 92% fidelity, the performance index used to measure the quality of

quantum entanglement. This is the highest fidelity value achieved anywhere in the world based on spin-photon entanglement in a solid state system. We have also achieved a photon pulse width of 600 picoseconds, which is the lowest in any system and will enable high-speed operation.

As well as facilitating high-speed operation and integration using optical semiconductor devices, our research also paves the way for quantum repeater systems based on existing low-loss fiber-optic communication networks using photons with a wavelength of 1.56 microns.



Figures: The graph on the left shows variation in spin and how it correlates with linear photon polarization. When photon polarization is horizontal (H), spin has a far higher probability of up-spin. When photon polarization is vertical (V), spin has a higher probability of down-spin. The graph on the right shows the direction of spin and how it correlates with circular photon polarization. When photon polarization is the right ( $\sigma$  +), spin has a far higher probability of pointing to the left. When photon polarization is the left ( $\sigma$ -), spin has a higher probability of pointing to the right.

#### Current Research Topics of Reseach Staff of NII

|  | Mat | hematica | I Informatics |
|--|-----|----------|---------------|
|--|-----|----------|---------------|

| Mathematical Informatics |   |  |
|--------------------------|---|--|
| Takeaki Uno              | Efficient and practical fast algorithms for solving large scale problems arising from data mining and genome sciences /<br>Theory of Complexity on Discrete algorithms and enumeration algorithms /<br>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   |  |
| Ryota Kobayashi          | Data mining / Computational neuroscience / Machine learning   |  |
| Kunihiko Sadakane        | Succinct data structures for efficient storage and search of data / Data structures for fast string processing /<br>Graph exploration algorithms, random walks  |  |
| Ken Hayami               | Numerical Analysis, Numerical Linear Algebra /<br>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 Log         | gic   |  |
| Makoto Kanazawa          | Lambda calculus and formal grammar / Logical semantics of natural language  |  |
| Makoto Tatsuta           | a Theory of programs / Type theory / Constructive logic   |  |
|                          | ation   |  |
| 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               | Applications of Bose-Einstein condensation to quantum technology / Quantum information and computation  |  |
|                          |   |  |

#### A wide range of promising applications for the age of the smartphone New developments in acoustic signal processing technologies using microphone arrays

Nobutaka Ono

Most animals, including humans, have two auditory sensory organs, in the form of ears. By comparing the time and the intensity of sounds arrived at both ears, we are able to recognize the direction of sound or pay attention to the sound coming from the specific direction. In terms of technology, these acoustic sensing capabilities are realized using a "microphone array". In this context, "array" simply refers to a number of devices in a row. Basically, by arranging a number of microphones in a row and processing the audio signals recorded by them, we can realize the ability to localize the sound source or extract the specific sound from mixtures. The aim is to use this technology in applications such as manmade systems and robots.

One area of research we are working on is something called "blind source separation". This involves technology capable of separating mixture sound into each of sound sources without any a prior knowledge of the directions of the sounds (blind). Possible applications include suppressing background noise for high quality speech communication, separating and recognizing overlapped speech, and isolating, editing and processing individual instruments from recorded musical performance. Many algorithms for blind source separation have been developed to date, but they have suffered from the high computational cost. In recent years, we have successfully developed a novel fast algorithm for blind source separation using a modern optimization framework known as the auxiliary function method, and have implemented it as an iPhone app. capable of performing blind source separation in around one fifth of the recorded signal length.

We have recently been working on a new framework: asynchronous microphone arrays. When using microphone array technology, the time difference of arrival between channels is crucial because it is one of the most important spatial information. Therefore, with conventional techniques, it is necessary that all of the microphones have to be synchronized with one another. These days however, we are surrounded by many smartphones and other devices with recording capabilities. If we could use these asynchronous recording devices as a microphone array, it would open up a wide range of new applications. Say for example that everyone attending a meeting records the contents of the meeting on their smartphones. When the meeting is over, they upload the recorded audio signals onto an online server, where they are automatically synchronized and processed. Individual speech could then be separated and picked out, enabling minutes from the meeting to be compiled using speech recognition and sent to all attendees. A system along those lines could well be possible.

As we are fast approaching an era in which everyone has a smartphone or equivalent recording device, new developments are about to take place in audio sensing technology.



Figures:The photo shows an iPhone attached with a stereo microphone, and the developed iPhone app. Pressing the "Separation" button on the app immediately separates the mixed audio signals into two sound sources. There are potential applications for this technology in various different fields, from producing minutes from meetings to recording live performances.

#### Material and Life Informatics

| Hiroko Satoh       | Chemoinformatics / Computer chemistry / Molecular modelling  |
|--------------------|--|
| Asao Fujiyama      | Comparative genomics research  |
| Intelligent Inform | natics   |
| Ryutaro Ichise     | Machine learning / Knowledge Systems / Data mining   |
| Tetsunari Inamura  | Human robot interaction / Synthetic study of robot intelligence based on stochastic information processing /<br>Intelligent information processing based on embodiment of robots |
| Katsumi Inoue      | Inference and knowledge representation / Hypothesis-finding based on induction and abduction / Systems biology / Systems resilience  |
| Nobutaka Ono       | Sound source localization • separation based on microphone array / Coding of acoustic signals based on a spectrogram /<br>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     | Resilient networks / Disruption-Tolerant Networks (DTNs)   |

#### Research

### Information Systems Architecture Science Research Division

We conduct research into the architecture and systems behind computers, networks and other forms of hardware and software.

| Research into distributed systems and emissions trading | Labina Catab |
|---|--------------|
| Creating a low carbon society using IC tags             | Ichiro Saton |

Reducing  $\mbox{\rm CO}_2$  and other greenhouse gas emissions has become a global issue.

Options such as growing forests to absorb  $CO_2$  and upgrading to low-emission equipment are often costly, and can even restrict economic activity in some cases. One possible solution is for companies and individuals to receive "emission credits" for reducing their own emissions, or helping others to reduce their emissions. Demand for emission credits however remains low. One of the reasons for this is that the emissions trading process is over-complicated and can only be carried out electronically, incurring a hefty service charge. As a result, trading is limited to a small number of large companies, as it is effectively inaccessible to small and medium-sized companies and individuals.

Here at NII, we have come up with a supply chain solution using IC tags, to enable general consumers to engage in emissions trading. Emission credits are divided into smaller lots and displayed on stickers, which are

then affixed to products. By embedding an IC tag or barcode in each sticker, they can be used in much the same way as investment securities. Emission credits are transferred to the person who buys the product, which simplifies transactions and provides a greater degree of freedom. We started experimenting in February 2011, when we actually began selling drinks cartons with emission credits affixed in supermarkets, on a trial basis.

One of the key aspects of this experiment is the provision of individual emission credit accounts. This is the first time this has been tried anywhere in the world. Consumers are able to save emission credits in their account and then use them as they see fit, much like a regular bank account. If products offering bonus emission credits were to be circulated in the future,

#### Current Research Topics of Reseach Staff of NII

| Network Architecture  |   |  |
|---|---|--|
| Shunji Abe  | Researches on performance analysis based on communication traffic measurement and QoS control method /<br>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 |   |  |

Resource allocation and quality of service in communication networks /

Network traffic modeling and analysis / Wireless ad-hoc and sensor networks

#### Computer Architecture

Yushena Ji

| 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       |

consumers would start to choose products with larger bonuses, driving up demand for emission credits. We believe that this could potentially contribute to the creation of a low carbon society.

Building on this experience, for our next experiment we tried dividing credits into smaller lots and selling them in department stores, for regular consumers to use. This gave consumers a new way to provide support, by purchasing credits from forests grown in the area devastated by the earthquake (financial support for the affected area), or donating to a chosen NPO engaging in earthquake recovery support activities (reducing the environmental impact of reconstruction support). Making the most of everything we have learnt from our research and experiments in emissions trading, we now intend to incorporate that into our intended research into distributed systems, as we continue to work in both directions in the future.



### Contribution of cloud computing to education and research Academic cloud

When universities, research institutes and other academic organizations use cloud computing, as a means of storing and processing data via a network, it is known as an "academic cloud".

Whereas clouds are usually designed so that their visible, to use these efficiently, the key feature of the academic cloud at NII is that the and the underlying mechanisms are visible. Academic clouds are about more than just using computers. They enable students to learn about and research cloud mechanisms themselves.

That is why we exclusively use open source technologies, whose specifications are freely available, and enable users to modify and alter the contents of the cloud themselves.

Most clouds are used with anonymous people, all sharing one machine. The academic cloud at NII however is designed so that

machines can be grouped together and used solely by specific research teams or classes. As machines are only used by team members, their contents can be freely altered and shared within the team.

Until now, users always had to set up a computer every time they wanted to train or practice using computer languages or the web. Using the cloud however makes it easy to access saved training environments. Instead of taking a whole day, this means that users can set up environments in a matter of minutes. It is also possible to set up computer-based menus in advance, for purposes such as economic simulations or document searches. As there is no need for users to set things up themselves, this lowers the threshold for more people to use computers. We developed the NII academic cloud in 2009 and began using it from 2010 onwards.

We believe that clouds will become commonplace at

all universities within the next five years or so. In the future, clouds will no doubt connect to one another and work in synergy. We are optimistic that all of the machines in the world will one day be connected, so that they function as a single system.

The key benefit of collaboration between universities and research institutes is that information can be shared via the cloud as part of joint research projects, making it easy to analyze data or run simulations without having to think about physical locations. Here at NII, we are training human resources to fully exploit cloud computing and develop new cloud mechanisms, and hope to make a real contribution to the development of this field in the future.



#### 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 /<br>Software Engineering: Dependable Software Construction, Bidirectional Model-driven Software Development /<br>Parallel Programming: Skeletal Parallel Programming, Automatic Parallelization |  |
| Software Engineering |   |  |
| Shin Nakajima        | Dependable Software Engineering / Formal Methods / Model-Checking   |  |
| 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 /<br>Formal verification of real-time software   |  |
| Kenji Tei            | Middleware for open wireless sensor networks / Software Engineering for Cyber-Physical System   |  |
|                      |   |  |

Nobukazu Yoshioka

#### Research

### Digital Content and Media Sciences Research Division

We conduct research into methods of analyzing, generating, storing, using and processing text, images and various other content and media, from theories to actual systems.

#### Protecting photographed subjects against invasion of privacy caused by unintentional capture in camera images Privacy protection techniques using differences in human and device sensitivity

Isao Echizen

Due to developments in the ubiquitous information society, computers, sensors and their networks are located in all places, and useful services can now be received at all times and in all spaces of our lives. On the other hand, however, there is now the actual problem that privacy information is easily disclosed as a result of the popularization of portable terminals with built-in cameras or GPS and other sensors. In particular, invasion of the privacy of photographed subjects is becoming a social problem due to photographs taken without the permission of the subjects and photos unintentionally captured in camera images by portable terminals with built-in cameras being disclosed by the photographer on SNS together with photographic information. As a result of developments in facial recognition technology in Google images, Facebook, etc. and the popularization of portable terminals that append photos with photographic information (geotags), such as photo location and time, as metadata when the photo is taken, information such as when and where photographed subjects were is revealed from the disclosed photo of the person concerned via photos taken and disclosed without their permission. Essential measures for preventing the invasion of privacy caused by photographs taken in secret and unintentional capture in camera images is now required.

The possibility of unintentional capture in camera images resulting in the invasion of privacy has already been pointed out in Europe and other regions. It has been reported that, according to experiments conducted at Carnegie Mellon University (CMU), for close on a third of tested subjects who had agreed to being photographed for the experiment, their names could be identified by comparison with information of photos, etc. on disclosed SNSs, and, further, that there were also cases where the interests of the tested subjects and some social security numbers also were found out. Furthermore, due to concerns about the invasion of privacy from SNS facial recognition functions, the European Union (EU) has requested the

invalidation of facial recognition in Facebook intended for European users. Against this backdrop, we have become the first in the world to develop new technology for protecting photographed subjects from the invasion of privacy caused by photographs taken in secret and unintentional capture in camera images. This technology focuses in the differences on human visual sense and the spectral sensitivity characteristics of imaging devices on cameras, and facial detection of photographed subjects can be made to fail only when photos are being taken without the addition of any new functions to existing cameras. This is achieved by the photographed subject wearing a wearable device – a privacy visor – equipped with a near-infrared LED that appends noise to photographed images without affecting human visibility.



Example of facial detection

Left: Near-infrared LED not lit (detection successful), Right: Near-infrared LED lit (detection failed)

| Fuyuki Ishikawa   | Description, analysis, and guarantee of functions and quality in the integration of Web services /<br>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 Langua   | ge 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 /<br>Modeling and implementation of high-performance information retrieval systems / Text mining   |
| Keizo Oyama       | Data analysis of web user behavior and improvement of access to information / Web information retrieval technology /<br>Full text search technology  |
| Yusuke Miyao      | Syntactic parsing, semantic parsing / Information extraction / Information retrieval   |
| Junichi Yamagishi | Speech information processing / speech-based human machine interaction / speech-based assistive technology   |

#### **Current Research Topics of Reseach Staff of NII**

#### Foundations of Content Management

#### free viewpoint image rendering of 3D scene Immersive visual communication

Imagine a visual experience so real that you want to shake hands with a colleague rendered on a large screen. Immersive visual communication is a technology that enables this kind of ultra-realistic communication, overcoming the physical barrier of long distances.

Made possible by ubiquitous media sensing, this is an evolutionary technology that involves visual data processing, transport and novel viewpoint image rendering using data captured by multiple cameras of a 3D scene from different angles.

The aim is to achieve "real 3D", meaning that any viewpoint image can be synthesized and rendered from any virtual camera angle, whether it is from the side or even from behind the object of interest. By taking images of the subject from multiple angles using many cameras, and then combining images from different perspectives, it is possible to recreate an immersive 3D visual experience.

From a technical standpoint, there are three key components when it comes to immersive visual communication. First, one needs to compactly represent and encode large volumes of image data taken from different cameras. Second, one needs to consider the effects of packet loss when transmitting data over a loss-prone packet delivery network, to minimize any adverse effect on image quality. Finally, one needs to track and predict the viewer's eye locations and head movements, and inform the sender to transmit the appropriate data for view rendering. One fundamental research issue that is crucial is geometric data compression. Using a special camera to capture depth images makes it possible to derive the 3D geometry of a dynamic scene. Given camera-captured color images and geometric data, one can synthesize novel viewpoint images that enable users to observe the subject of interest from any chosen angle. Geometric data therefore needs to be compressed, so that it can be transmitted over a bandwidth-constrained network. We are conducting research in optimal geometry representation and compression, in order

to ensure that the rendered viewpoint images that the viewer ultimately observes are not distorted in any way.

This technology is attracting considerable attention from global companies in the videoconferencing and entertainment industries. Many are currently involved in joint collaborative research.



Figure 1: These are examples of color & depth images from the same viewpoint. The depth image features sharp contours and smooth surfaces, which is one way to represent the geometry of the scene.



Figure 2: Example of a 3D visual communication system. An image taken by a single camera is only able to capture one viewpoint of the subject (left). By taking images of the subject from different angles using multiple cameras, and then combining the necessary images, it is possible to produce a free viewpoint visual experience, one where a user can observe the 3D scene from any chosen viewpoint (right).

#### Pattern Media

Mayumi Bono

Seiji Yamada

| 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 /<br>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 /<br>Face annotation and retrieval / Video mining / Efficient methods for handling high              |
| Human and Know    | vledge Media  |
| Kenro Aihara      | Computer supported lifelong learning by using digital archives about historical and artistic objects /<br>Integration of user's context in real- and virtual World                            |
| Frederic Andres   | Model Driven Archicture knowledge management / Image learning ontology / Semantic tracking & computing  |
| lkki 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 /<br>Automatic content creation / Emotion and sentiment recognition from text |

Understanding Multimodal interaction / Understanding Conversational Structures in Multi-party Interaction

Human-Agent Interaction / Interactive Information Gathering/Retrieval

Gene Cheung

### Information and Society Research Division

We conduct interdisciplinary research combining information and systems technology with human and social sciences, for a society in which the information world merges with the real world.

#### Opening up new possibilities with Researchmap and NetCommons Helping to share information in emergency situations using CMS from NII

Noriko Arai

Having developed a content management system (CMS) that enables users to create websites, NII provides free access to Researchmap for researchers and NetCommons for schools, to help as many people as possible to share information. Although these CMS were developed as a means of transmitting information under normal circumstances, experiences during the Great East Japan Earthquake showed just how effective they are for sharing information in an emergency situation.

Research

In the immediate aftermath of the earthquake on March 11 for instance, universities and research institutes found that their servers had crashed and they couldn't access their websites. Instead, we encouraged users to post information relating to universities and meetings on the bulletin board on the top page of Researchmap. By the end of May, around 110 items had been posted. We also set up an automatic feed to post notices on the bulletin board on Twitter every hour, in order to disseminate information further.

We were contacted by the Ministry of Education, Culture, Sports, Science and Technology, which wanted to set up a portal site to match schools in the affected area with support providers using NetCommons. Ordinarily, it would take time to set up a site for a public institution like that, from determining the right program and verifying content. As NetCommons has the functionality and advanced operability to handle a range of different demands however, we were able to start developing a site immediately. The site was launched on April 1 as a result, enabling around 360 matches to be made by early July. We gradually realized that informatics specialists such as ourselves weren't the only ones using CMS for emergency purposes. A junior high school in Ibaraki prefecture for example used a website made via NetCommons to confirm the safety of students' families. With individual schools using NetCommons in different ways like this, it proved to be a highly effective crisis management tool. As a result, prefectures such as Kyoto, Gifu and Hyogo have since installed NetCommons at all schools.

In the past, landlines were the primary means of communication in an emergency. Whereas landlines have the benefit of being able to communicate with other people directly however, drawbacks include the effort required to call everyone individually and the fact and promoting CMS as part of crisis management in the future.

Sharing information using NetCommons
Information providers
Content creators
Website visitors
Teachers
Parents/ouardians

that people prefer not to receive calls late at night or early in the

morning. Fortunately, the Internet is here to solve issues such as

these. In particular, Researchmap, NetCommons and other CMS are

likely to attract more and more attention in the future for their ability

to develop user-friendly websites. We are committed to improving



Figure:NetCommons was used widely after the Great East Japan Earthquake. Reasons for this included (1) ease of updating information, enabling timely posting, (2) the ability to view and post information via mobile phone as well as computer, and (3) the option to set up a dedicated space for sharing information between specific users, via the Group Home function.

| 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 /<br>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   |
| Takayuki Mizuno   | Statistical analysis, modeling, prediction and control of socioeconomic phenomena based on big data / Econophysics   |
| Akira Miyazawa    | Union catalogue database construction and usage / Metadata representation and construction /<br>Character codes as a fundamental tool for data representation / D: Data processing utilitiesndexing                    |

#### **Current Research Topics of Reseach Staff of NII**

#### Exploring the rise of new media and its impact on human society Striving to bridge information sciences and social sciences

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 interdisciplinary social science research 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.

# C 232 C 23 C 23 C 23 C 2 C 23 C 2

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 /<br>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 /<br>Empirical analyses on the role of Grants-in-Aid for Scientific Research for promotion of basic research /<br>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 /<br>Social network and human communication / Social capital theory   |  |  |
| Noboru Sonehara           | Digital commerce (dCommerce) system / Intellectual property rights lifecycle management system   |  |  |

#### Tetsuro Kobayashi

### **Grand Challenge**

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

Breakthroughs algorithms

- Dependable software
- Content value creation

#### Todai Robot Project

This project, with the NII at its core, has been launched with the purpose of opening up a new horizon by reintegrating the subfields of Artificial Intelligence that have come about since the 1980's, and encouraging young people to have dreams. Research activities have been conducted with two specific benchmarks, to achieve high marks on the National Center Test for University Admissions by 2016, and to pass the entrance examination for the University of Tokyo by 2021. The accuracy of fundamental AI technologies accumulated up until now are intended to improve the future value creation of information technology, and deeper and more comprehensive understandings of human thoughts will be shared among domestic and foreign researchers. In this project, the research activities will not only be undertaken in order to amass interdisciplinary knowledge and advance technology, but also improve international collaboration.

Bridging the semantic gap affecting image media
 ICT governance: its social system and legal system
 Artificial brain project



### Informatics for future value creation 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/e/

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/english/en-about-us/yamamoto-yoshihisa.html)

| Core researcher  | Research support coordinator            |  |  |  |
|--|---|--|--|--|
| Yoshihisa Yamamoto, NII & Stanford Un  | Koichi Semba, NII                       |  |  |  |
| National Institute of Informatics: Operational support institution<br>RIKEN: Collateral institution<br>The University of Tokyo: Collateral institution |   |  |  |  |
| Subtopics  |   |  |  |  |
| Quantum information systems  | Superconducting quantum computing       |  |  |  |
| Yoshihisa Yamamoto   | Tsai, Jaw Shen, RIKEN & NEC Corporation |  |  |  |
| Spin quantum computers   | Quantum information                     |  |  |  |
| Seigo Tarucha, the University of Tokyo   | Yoshiro Takahashi, Kyoto University     |  |  |  |
| Quantum standards  | Quantum communication                   |  |  |  |
| Hidetoshi Katori, the University of Tokyo  | Nobuyuki Imoto, Osaka University        |  |  |  |
|  |   |  |  |  |

### **Projects**

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

#### 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)

#### 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

#### 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)

#### Next-generation software strategies

- Top SE (Education Program for Top Software Engineers) (Shinichi Honiden) ⇒P.17
- Development of Dependable Network-on-Chip Platform (Tomohiro Yoneda)

#### A solutions-seeking approach

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

#### 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)



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 net commons academic societies, in-house groupware, and e-learning sites.

#### Integrated informatics

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

#### 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

For this project, the research team is working on the development of a novel ultra high-speed database engine, and demonstrating the validity of the proposed engine in pursuit of next-generation strategic social services (cyber-physical services) made possible by high-speed data analysis. 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)

Thanks to progress in information technology, a range of phenomena in the real world that we inhabit have been instantly acquired in a digital format through 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/english/en-about-us/kitsuregawa-masaru.html)



Cyber-Physical Service

Research

### Research and Development Center for Academic Networks

Develops and offers new services and fuctions for increasing the operational efficiency of the Science Infomation NETwork 4 (SINET4), which constitutes part of the Cyber Science Infrastructure (CSI).

### 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/?lang=en

#### 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.

#### Global Research Center for Cyber-Physical Systems

Promote researches on cyber and physical(real) world collaboration aiming at solving social issues and creating new values through the research.

#### Global Research Center for Big Data Mathmatics

Engaged in cutting-edge research and human capital development to establish NII as a world-class hub for Big Data Mathmatics with a central focus on developing high-speed algorithms.

### 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                       | (FY2012) | (as of March 2013)                |
|---|----------|-----------------------------------|
| Research Categories   | Number   | Awarded Amount (thousands of yen) |
| Scientific Research (A)                                     | 7        | 90,610                            |
| Scientific Research (B)                                     | 17       | 85,020                            |
| Scientific Research (C)                                     | 14       | 21,190                            |
| Exploratory Research  | 14       | 21,840                            |
| Encouragement of Young Scientists (A)                       | 2        | 8,710                             |
| Encouragement of Young Scientists (B)                       | 13       | 19,240                            |
| Research Activity Start-up                                  | 2        | 3,120                             |
| Special Purposes  | 9        | 6,800                             |
| Scientific Research on Innovative Areas                     | 3        | 21,450                            |
| Grant-in-Aid for Publication of Scientific Research Results | 1        | 5,800                             |
| Total   | 82       | 283,780                           |

#### Other grants (FY2012)

(as of March 2013)

(as of March 2013)

|              | Number | Awarded Amount (thousands of yen) |
|--------------|--------|-----------------------------------|
| Other grants | 3      | 876,787                           |

#### University-Industry Cooperation and Collaboration (FY2012)

|  | Number | Amount Received (thousands of yen) |
|--|--------|------------------------------------|
| Joint Research with the Private Sector, etc. | 16     | 28,060                             |
| Commissioned Research                        | 28     | 539,810                            |
| Endowments                                   | 19     | 37,265                             |
| Others                                       | 2      | 29,000                             |

#### 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 (FY2012)

| Categories  | Number |
|---|--------|
| Visiting Researchers (Foreign Research Scholars)          | 22     |
| // (JSPS Postdoctoral Fellowship for Foreign Researchers) | 3      |
| // (Others)   | 16     |
| Cooperative Scholars                                      | 31     |
| Requested Researchers                                     | 106    |
| Project Researchers                                       | 86     |
| Special Joint Researchers                                 | 49     |
| Total   | 313    |

### **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)

| (total number sincce FY2004) |     |  | March 2013) |
|------------------------------|-----|--|-------------|
| Total Number                 | 144 | Attribution : Organization Attribution | 134         |
| Total Number                 | 144 | Attribution : Individual Attribution   | 10          |
| Applications Number          | 149 | Domestic Number                        | 124         |
| Applications Number          |     | foreign number                         | 25          |
| Degistration Number          | 22  | Domestic Number                        | 30          |
| Registration Number          | 22  | foreign number                         | 3           |

#### List of Japanese patents owned

| List of Japanese patents owned  | (as of M                   | arch 2013)   |
|---|----------------------------|--------------|
| Patent  | <b>Registration number</b> | Joint Patent |
| Apparatus, method and program for retrieving and displaying image information   | JP4441685                  |              |
| Quantum key delivering method and communication apparatus   | JP4231926                  |              |
| Time-series data analysis device, and time-series data analysis program   | JP4734559                  |              |
| System, server, method and program for sharing information  | JP4799001                  |              |
| Ultrasonic distance measurement system and method   | JP4041899                  |              |
| Sequential content delivery device, sequential content receiving device, and method therefor  | JP4734563                  |              |
| Contents presentation apparatus, contents presenting method and contents presentation program   | JP4403276                  |              |
| Text content presentation apparatus, text content presentation method and text content presentation program   | JP4143628                  |              |
| Method and apparatus for evaluating communication traffic that uses fragmentray self-similarity process   | JP4081552                  |              |
| Imaging device and imaging method using out-of-focus structure  | JP4437228                  |              |
| Information resource retrieval device, information resource retrieval method and information resource retrieval program                                 | JP4324650                  |              |
| Active content distribution system, active content distribution program and active content distribution method  | JP4392503                  |              |
| Device and method for generating traffic congestion prediction information, and sroute search system  | JP4729411                  |              |
| Content selling device and method   | JP4304278                  |              |
| Document indexing device, document retrieval device, document classifying device, and method and program thereof  | JP4362492                  |              |
| Video provision device and method   | JP4359685                  |              |
| Projection image correction system and correction information generation program  | JP4982844                  |              |
| Digital content registration distribution apparatus, system and method  | JP4956742                  |              |
| Communication path apparatus for data driven processor having tree type diversion path and merging path, and  | JP5115922                  | •            |
| Airing structure of three dimensional integrated electrical circuit and layout method therefor  | IP5024530                  |              |
| Ouantum key distribution method, communication system, and communication device   | JP4862159                  |              |
| Time reference point information transmitting system and receiver   | IP4621924                  |              |
| Ouantum repeater  | JP5082039                  |              |
| Collection/delivery route selection system  | JP4374457                  |              |
| Air conditioner for vehicle and its control method  | IP5177667                  |              |
| Route switching method, server device, boundary node device, route switching system and route switching programs  | JP5062845                  |              |
| Direct path establishing method, server device, sender network node device, direct path establishment network, and program thereof                      | JP4999112                  | •            |
| Path management control method, path management control program, path management control device and path management control system                      | JP4806466                  | •            |
| Intramemory data structure of finite automaton, memory storing data with the structure, and finite automation ex-<br>ecuting apparatus using the memory | JP5063780                  | •            |
| Emission allowance trading system and emission allowance trading method   | JP5207195                  |              |

#### List of registered trademarks

| List of registered trademarks (as of March 2013) |                     |                     |                     |                      |                     |  |
|--|---------------------|---------------------|---------------------|----------------------|---------------------|--|
| Trademark mode                                   | Registration number | Trademark mode      | Registration number | Trademark mode       | Registration number |  |
| NII  | 4811291             | n c net commons     | 5152641             | 学認/GAKUNIN           | 5341899             |  |
| Net Commons                                      | 4832775             | Commons Partners    | 5208443             | NetCommons Ready     | 5369242             |  |
| picture+NET                                      | 4934163             | NeXt Commons        | 5191260             | 遷画                   | 5490233             |  |
| NAREGI 💥   | 4952143             | researchmap         | 5261160             | picture (パレット)       | 5498318             |  |
| トップエスイー  | 4943324             | GRACE+picture       | 5275386             | picture (学認/GAKUNIN) | 5498319             |  |
| スマーティブ   | 4976131             | picture (grace)     | 5261216             | picture(情報犬)         | 5538784             |  |
| WebELS   | 4980388             | picture (garce/NPO) | 5279082             | 情報犬                  | 5538785             |  |
| Net Commons                                      | 5182361             | edubase             | 5296963             |                      |                     |  |

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

### Education

### 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.  $\Rightarrow$  P.13

#### 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 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.

#### 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 Space



Cloud server room



edubase Stream

#### Education

### 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

#### 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 SOKEN-DAI 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**

| Enrollment                           |                                    | (as of April 2013)  |         |
|--------------------------------------|------------------------------------|---------------------|---------|
| A five-year doctor<br>course program | A three-year doctor course program | Research<br>Student | Total   |
| 32(21)                               | 44(22)                             | 2(2)                | 78 (45) |

( ) Foreign students among total

Students Data (as of April 2013)





Guidance for new students





Medal ceremony



| Career options (past three years) (past three years) |                        |         |                    |        |  |
|--|------------------------|---------|--------------------|--------|--|
| Year of Graduation                                   | University/Institution | Company | Not yet determined | Total  |  |
| FY2012   | 6(1)                   | 3(0)    | 1 (0)              | 10(1)  |  |
| FY2011   | 8(3)                   | 1(0)    | 2(1)               | 11 (4) |  |
| FY2010   | 4(2)                   | 3(1)    | 0                  | 7(3)   |  |
| Total  | 18(6)                  | 7(1)    | 3(1)               | 28 (8) |  |

( ) Foreign students among total

#### **Cooperation with Graduate Schools**

NII actively cooperates with the University of Tokyo, Tokyo Institute of Technology, Waseda University, JAIST, Kyusyu Institute of Technoloty and The University of Electro-Communications. NII also accepts graduate students from these institutions for additional instruction.

#### **Cooperation with Graduate Schools**

| University  | Graduate School  |         |  |
|---|--|---------|--|
| The University of Tokyo                                       | Graduate School of Information Science and Technology        | FY2001~ |  |
| Tokyo Institute of  | Graduate School of Information Science and Engineering       | FY2002~ |  |
| Technology  | Interdisciplinary Graduate School of Science and Engineering | FY2003~ |  |
|   | Graduate School of Fundamental Science and Engineering       | FY2005~ |  |
| Waseda University   | Graduate School of Creative Science and Engineering          |         |  |
|   | Graduate School of Advanced Science and Engineering          |         |  |
| JAIST (Japan Advanced Institute<br>of Science and Technology) | School of Information Science                                | FY2009~ |  |
| Kyushu Institute of   | Graduate School of Computer Science and Systems Engineering  | EV2010- |  |
| Technology  | Faculty of Computer Science and Systems                      | F12010~ |  |
| The University of<br>Electro-Communications                   | Graduate School of Information Systems                       | FY2012~ |  |

#### 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

| University                               |   |  |
|--|---|--|
| Ochanomizu University                    | Keio University                             |  |
| Chiba University                         | University of Tsukuba                       |  |
| The University of Electro-Communications | The University of Tokyo                     |  |
| Tokyo Institute of Technology            | NARA INSTITUTE of SCIENCE and TECHNOLOGY    |  |
| École Polytechnique                      | The Karlsruhe Institute of Technology       |  |
| Stanford University                      | Pierre and Marie Curie University - Paris 6 |  |
| Humboldt University Berlin               | Braunschweig University of Technology       |  |
| Goethe University Frankfurt              |   |  |

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 ot | her universities |                          | (FY2012) |
|------------------|------------------|--------------------------|----------|
| Master Course    | Ph.D. Course     | <b>Research Students</b> | Total    |
| 64               | 47               | 1                        | 112      |

(FY2012)

### **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 2 |        |                |                     |  |  |
|--|--------|----------------|---------------------|--|--|
| Document type                              | Books  | Bound journals | Journals (in title) |  |  |
| Domestic<br>Documents                      | 14,601 | 9,286          | 251                 |  |  |
| Foreign<br>Documents                       | 12,950 | 8,189          | 32                  |  |  |
| Total                                      | 27,551 | 17,475         | 283                 |  |  |

#### 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 Online Library | John Wiley & Sons.  |
| IEICE                | The Institute of Electronics, Information and Communication Engineers |

#### Facility, Equipment

|                    | Reading room   | Stack room        |  |
|--------------------|--|-------------------|--|
| Area               | 140m <sup>2</sup>                                      | 271m <sup>2</sup> |  |
| Seats              | 8  | 3                 |  |
| PC for search      | 2  |                   |  |
| Other<br>equipment | Automatic Book Circulation Machine<br>(IDEC PalsRC15E) |                   |  |
|                    | Micro reader printer (KonikaMinolta SP7000)            |                   |  |
|                    | Copier (DocuCentre-IV C2275)                           |                   |  |



Reading Room 1



Reading Room 2



Subscribed journals

### International Exchange

### **Contribution to Internationalization of Informatics**

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.

Research Exchange with Universities and Institutions (as of April 2013)

| NII Internship Program 2012 | 146 students from 22 countries |
|-----------------------------|--------------------------------|
| MOU Grant/                  | 46 persons to 14 countries     |
| Non-MOU Grant 2012          | 74 persons from 19 countries   |

| Intercommunication of researchers | (as of April 2013)    |
|-----------------------------------|-----------------------|
| Program                           | Number of researchers |

|  | riografii   | researchers |
|--|---|-------------|
| Japan Society  | Postdoctoral Fellowships for Foreign Researchers  | 2           |
| for the<br>Promotion   | Postdoctoral Fellowships for Foreign Researchers<br>(Short-term;for researchers from Western countries) | 0           |
| of Science (JSPS)  | Invitation Fellowship Program for Research in Japan   | 1           |
| Other researchers accepted<br>(visiting researchers, visiting professor [full-time]) |   | 14          |

#### International Exchange Agreement

| International Exchange Agreement (as of April 2013                                |   |   |                         |              |  |  |
|---|---|---|-------------------------|--------------|--|--|
| Country   |   | Organization  | Country                 | Organization |  |  |
| People's  |   | Department of Automation, School of Information                                   | Argentina               | ٠            | Faculty of Exact and Natural Sciences, University of Buenos Aires                        |  |
| China   |   | Institute of Computational Mathematics and Scientific/Engineering Computing Acad- | Irland                  |              | University of Limerick   |  |
|   |   | emy of Mathematics and System Sciences, Chinese Academy of Sciences               | French Republic         |              | Computer Laboratory Nantes Atlantique, University of Nantes                              |  |
|   |   | Tongji University   |                         |              | Science and Control(INRIA)   |  |
|   |   | School of Electronics Engineering and Computer Science, Peking                    |                         |              | Grenoble Institute of Technology(INPG)   |  |
|   |   | University  |                         |              | Joseph Fourier University(UJF)   |  |
|   | H | The School of Electronic. Information and Electrical                              |                         |              | Laboratory of Computer Sciences, Paris6  |  |
|   |   | Engineering, Shanghai Jiao Tong University  |                         |              | National Polytechnic Institute of Toulouse(INPT)   |  |
|   |   | University of Science and Technology of China                                     |                         |              | National Center for Scientific Research (CNRS)   |  |
| Taiwan  |   | College of Electrical Engineering and Computer                                    |                         |              | Paul Sabatier University(UPS)  |  |
| Kingdom of  |   | Chulalongkorn University  |                         | Ĭ            | University of Nice Sophia Antipolis  |  |
| Thailand  |   | Asian Institute of Technology   | United Kingdom          |              | Department of Computer Science, Faculty of   |  |
|   |   | Kasetsart University  | of Great Britain        |              | Engineering Science, University College London   |  |
|   |   | National Electronics and Computer Technology Center National Sci-                 | and<br>Northern Ireland |              | Faculty of Mathematics and Computing, Open University                                    |  |
|   |   | ence and Technology Development Agency (NECTEC)                                   |                         |              | University of Bristol  |  |
| Socialist   |   | International Research Center MICA, Hanoi   |                         |              | University of Bath   |  |
| Republic of   |   | University of Technology  |                         |              | Department of Computing, Imperial College London   |  |
| Vietivalli  |   | Hanoi University of Science and Technology  |                         |              | The Computing Laboratory, University of Oxford   |  |
|   |   | Vietnam National University of Ho Chi Minh City                                   |                         |              | School of Computer Science & Electronic Engineering, University                          |  |
|   |   | Vietnam National University, Ho Chi Minh City, University of Science              |                         |              | School of Informatics. The University of Edinburgh                                       |  |
|   |   | Vietnam National University, Hanoi, University of                                 |                         |              | Newcastle University   |  |
| People's Republic   |   |   | Federal Republic        |              | Faculty of Applied Informatics. University of Augsburg                                   |  |
| of Bangladesh   | - | University of Dhaka   | of Germany              |              | German Research Center for Artificial Intelligence (DFKI)                                |  |
| Republic of   |   | Department of Computer Science and Engineering,                                   |                         |              | Faculty of Applied Science, University of Freiburg                                       |  |
| Noted   |   | Korea Education & Research Information Service                                    |                         | •            | Faculty of Mathematics, Computer Science and<br>Natural Sciences, RWTH Aachen University |  |
| Republic of   |   | School of Computing, National University of Singapore                             |                         |              | German Academic Exchange Service (DAAD)  |  |
| Australia   |   | The Australia-Japan Research Centre The Australian National University            |                         |              | Saarland University  |  |
| Australia   | Ť | National ICT Australia Limited (NICTA)  |                         |              | Faculty of Mathematics, Informatics and<br>Statistics, University of Munchen             |  |
|   |   | The Faculty of Engineering, Physical Sciences and                                 |                         |              | Technical University Berlin  |  |
|   |   | Faculty of Engineering and Information Technologies.                              |                         |              | University Library Center of North   |  |
|   | - | The University of Sydney  |                         |              | German National Library of Science and Technology  |  |
| United States of<br>America   |   | Department of Computer and Information  |                         |              | German National Library of Medicine  |  |
| , include   |   | College of Engineering, Universi t y o f Washington, Seattle                      | Kingdom of the          |              | Faculty of Civil Engineering and Geosciences,  |  |
|   |   | University Information Technology Services, Indiana University                    | Republic of Austria     |              | Vienna University of Technology  |  |
|   |   | Department of Computer Science, University of Maryland                            | Republic of Italy       |              | Department of Informatics Torino University  |  |
|   |   | New Jersey Institute of Technology  | Republic of Italy       |              | Electronics Information and Bioengineering Politecnico di Milano                         |  |
|   |   | International Computer Science Institute  | Switzerland             |              | Institute of Electrical Engineering, Ecole Polytechnique Eederale de Lausanne            |  |
|   |   | Reischauer Institute of Japanese Studies, Harvard University                      | Czech Republic          |              | Czech Technical Liniversity in Prague  |  |
|   |   | University of Southern California   | Snain                   |              | Polytechnic University of Valencia(LIPV)   |  |
|   |   | North American Coordinating Committee on Japanese Library Resources               | Span                    |              | Polytechnic University of Catalonia(UPC)   |  |
|   |   | Institute for Scientific Information, Inc.  | Portuguese              |              | Institute of Investigation and Development of  |  |
|   |   | Association of Research Libraries (ARL)   | Republic                |              | Computer system, Engineering in Lisbon(INESC-ID)   |  |
| Canada  |   | Faculty of Mathematics, University of Waterloo                                    | Arab Republic of Egypt  |              | Egypt-Japan University of Science and Technology   |  |
|   |   | University of Alberta   | Kingdom of Morocco      |              | Rabat International University   |  |
|   |   | School of Computer Science, McGill University                                     | For research correction | oper         | ration · 75  |  |
| Simon Fraser University (SFU)     For development and operational cooperation - 7 |   | ad operational cooperation · 7  |                         |              |  |  |

For development and operational cooperation : 7

#### NII Shonan Meeting

In February 2011, the NII launched the NII Sho nan Meetings, the first Dagstuhl-style seminar\* held in Asia. The purpose of the NII Shonan Meetings is to resolve various challenges in the 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.

So far, we have organized the seminars more than twenty times.

\*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.

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



Shonan Village Center



Top-level informatics researchers come together for intensive discussion.



NII Shonan Meeting (November 2012)

#### The Recent Topics of the NII Shonan Meetings

- 1. Bridging the theory of staged programming languages and the practice of high-performance computing May 19-22, 2012, 24 participants
- 2. Parallel Methods for Constraint Solving and Combinatorial Optimization May 28-31, 29 participants
- 3. A meeting of IT-enable Services (ITeS) Jul. 30- Aug. 2, 2012, 19 participants
- 4. Whole-Session Evaluation of Interactive Information Retrieval Systems Oct. 9-13, 2012, 24 participants
- 5. Grid and Cloud Security: A Confluence Oct. 15-18, 2012, 26 participants
- 6. The Future of Multimedia Analysis and Mining Nov. 3-6, 2012, 21 participants
- 7. Quantitative methods in security and safety critical applications Nov. 9-12, 24 participants
- 8. NII Shonan Configurable Computing Workshop Nov. 12-15, 2012, 22 participants
- 9. Social Issues in Computational Transportation Science Dec. 17-20, 2012, 16 participants
- 10. Multi-activity in interaction: a multimodal perspective on the complexity of human action Feb. 18-20, 2013, 28 participants

#### 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.

#### NII Shonan Meeting Memorial Symposium

To mark the first anniversary of the start of the NII Shonan Meeting, we organized a symposium on the theme of "For Making Future Value From Asia" in November 2012. The keynote lectures were given by Professor J.D. Ullman of Stanford University who is world-famous for his research on database theory; Professor R.A. Kowalski of Imperial College, London, who is a first-class virtual logic programming researcher; and Professor M. Kitsuregawa, the current Director General of the National Institute of Informatics. Over the period of two years since the launch, the NII Shonan Meeting has steadily gained visibility, and both project applicants and themes have broadened. We will continue to implement further activities in the future as a venue where Japanese and Asian researchers can manifest leadership.



相南会副

NII Shonan Meeting Memorial Symposium(November 2012)



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#### Agreement with German Academic Exchange Service (DAAD)

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

In December 2009 NII has signed a special agreement for 3 years with the German Academic Exchange Service (DAAD) that has allowed German post-doc to stay for one year at NII to conduct their research under the mentoring of NII researchers. This program existed also at the International Computer Science Institute (ICSI) in Berkeley, USA.

During 3 years NII has received 10 new post-docs. The contract has been renewed for 5 years until 2017 introducing more flexibility to welcome more German post-docs.

#### 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), Pierre and Marie Curie University - Paris 6, The 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        | (5)( 2012) |
|------------------------|------------|
|                        | (FY 2012)  |
| # of Joint Publication | 23         |
| # of Joint Workshop    | 6          |



JFLI Establishment Agreement Signing Ceremony



### Cyber Science Infrastructure (CSI)

### **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.

### A Network that Extends Across Japan and Beyond

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 GÉANT in Europe to facilitate dissemination of research information and collaborations over networks. SINET4 began operations in April 2011, SINET4 plays an important role as the core component of the Cyber Science Infrastructure(CSI).







#### Participating SINET Institutions

(as of March 31, 2013)

| National universities       | 86  |
|-----------------------------|-----|
| Municipal universities      | 65  |
| Private universities        | 320 |
| Junior colleges             | 62  |
| Technical colleges          | 55  |
| Inter-University Institutes | 16  |
| Others                      | 175 |
| Total                       | 779 |



### Science Information Network 4 (SINET4)

Science Information NETwork 4

#### Characteristics of SINET4

#### **O**Higher 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.

#### Provision of diverse services

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

#### BHigher 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.



#### Establishment of an environment for high-speed access lines

http://www.sinet.ad.jp/index\_en.html?lang=english

SNEIL

By undertaking shared procurement of access lines, a faster access system has been created for member institutions other than those on site (Institution on site). In addition, installment of nodes completed in all prefectures in Japan.

#### Opper layer deployment

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



#### Organization for Science Network Operations and Coordination

The administration of the Science Information Network is done in collaboration and cooperation between nationwide research institutes for information technology at universities and research institutes, and the Research and Development Center for Academic Networks at the NII based on the Organization for Science Network Operations and Coordination, which is a joint organization of universities, research institutions and the NII.



### **SINET4 Network Services**

We have designed a user-friendly and expanded services, for example resource on-demand (L1/L2) functionality, performance improvement software, and a portal page.

#### SINET4 Services

(Classification by network layer and QoS)



#### L2 On-Demand Service (in preparation)

When the user specifies an origin, a destination, duration, bandwidth to make a VPN reservation on the web display, the path is automatically set up and ready to use at the specified time.



#### **Private Cloud Environment via SINET**

We have built a framework that allows cloud service providers (email, storage, remote access, etc.) to connect directly to SINET. SINET users can access these services in a safe environment.

http://www.sinet.ad.jp/service/other/cloud\_services



jakuNin)

### **Establishment of Authentication Infrastructure**

#### Academic Access Management Federation in Japan (GakuNin)

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

Aiming to improve usability and to cut the operation cost of internal systems, many universities are now switching to the cloud services. The Academic Access Management Federation (GakuNin) is a structure that allows the use of a university's authentication infrastructure not only for internal services, but also for other collaborating universities and commercial services including the cloud, thus facilitating the safe and secure use of academic services on the Internet by identifying individuals and organization. With Single Sign-On, users can seamlessly and automatically log-in to multiple internal and external services just with a single log on procedure simply. For universities, building an authentication infrastructure compatible with GakuNin, this raises the baseline of security measures and reduces the cost of ID management.



- Joined by 59 identity providers (IdP) and 102 service providers (SP) (as of the end of March 2013)
- Only one ID/ password to remember.
- Single Sign-On(SSO).
- Accessible from anywhere in the world.
- Need no other software than a web browser.



GakuNin strives to maintain reliability by annual assessment of the IdPs operated by universities and institutions. GakuNin also provides LoA1 (Level of Assurance 1) certification services through the Open Identity Exchange (OIX) in the United States. Universities that have been certified for this high level of authentication infrastructure are able to use the US government services, including the databases of the National Institutes of Health(NIH).

#### **Issuing Server Certification**

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 SI-NET's security.

#### Server certification issuance situation (as of March 2013)

| Number of certificates issues              | 8,200           |
|--|-----------------|
| Number of institution such as universities | 295 institution |



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

### 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.



### **Academic Information Infrastructure**

### Support for Linkage between Institutional Repositories

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

In order to contribute to improving next-generation academic content platforms, NII promotes open access, and supports collaboration and the building of institutional repositories to communicate the outcome of educational research at universities and elsewhere. So far, NII has supported content enrichment, system collaboration and community formation at academic institutions in Japan. As a result, institutional repositories have now been built and are operational at more than 300 institutions.

#### JAIRO Cloud (shared repository service)

For institutions that find it difficult to independently build and operate their own repositories, NII provides a shared repository system environment in the form of a cloud service based on our institutional repository software WEKO (http://weko.at.nii.ac.jp/).

| Data              | (as of March 2013) |
|-------------------|--------------------|
| Institution using | ) the service      |
| 100               |                    |



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

### Japan Alliance of University Library Consortia for E-Resources (JUSTICE)

#### http://www.nii.ac.jp/content/justice\_en/

Aiming to implement a range of activities to provide stable and continuous access to academic information, including e-journals, JUSTICE is a leading large-scale consortium with approximately 500 participating national and private university libraries. To support the activities, NII has set up Library Liaison Office that functions as the JUSTICE Secretariat and is staffed from university libraries.



#### **Electronic archives**

We carry out the following activities to protect and provide electronic academic information on a permanent basis.

■ NII-REO (NII Electronic Resource Archives) http://reo.nii.ac.jp/index\_en.html Back numbers of international electronic journals (approx. 3.7 million) and an electronic collection of humanities and social science material (approx. 250,000 items) are stored on NII servers and provided to universities in Japan. The electronic resources are maintained in collaboration with JUSTICE.

#### CLOCKSS http://www.clockss.org/clockss/Home

An international project to ensure the long-term survival of, and guarantee access to electronic journals. NII participates in the project as the archive node for ASIA and are doing promotion activities for university libraries.

### 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)

国立情報学研究所 目期所在情報サービス NACSIS-CAT NACSIS-ILL

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 union catalog of books and serials consisting of the compiled databases can be freely accessed via the worldwide web online search service (Webcat Plus).

**Registered records** Libraries connected (ten of thousands) 1,400 12,000 11.955 1.258 1.200 10,000 Total registered records 1,000 8,000 Total connected libraries 800 6,000 600 4.000 400 2.000 200 0 0 '86 '88 '90 '92 '94 '96 '98 '00 '02 '04 '06 '08 '10 '12



#### 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.

#### Education and Training Programs

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

- User Training (Catalog Information Service / JAIRO Cloud (shared repository service))
- Advanced Training Programs (scientific and academic information web services, scientific and academic literacy education)
- Comprehensive training (aiming for core HR training through comprehensive coverage of themes involving the academic information infrastructure)

### Publishing and Communicating Academic Information

NII accumulates and structures the outcome of educational research produced at universities and research institutions, and provides access through a user-friendly interface.

#### Academic Information Platforms Essential to Researchers and Students

#### 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—

"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) **Collection Status** (As of the end of March 2013) Offering texts in academic journals and research NII-ELS bulletins in electronic form through CiNii # of article # of full text # of academic societies # of Articles. information documents periodicals and universities Academic 4,732 societies 392 16.02 million 3.86 million (full text) Universities 1,079 Full-text document (PDF) Enter Link to anykeyword full-text 認知的関連性における条件文の計算過程 E END 一 実営性性における機能な問題を解決するた したがって、この人間の機論通知は、利用的 論における更正な理解は秘密な問題性によっ hinan F. MATSI 10日の日本の日本の日本の日本市であるとの日本市である。 日本はまひの評価と治療・局後援急の低当(分長会2中国を引)用 のしているか。第46日日本等学業当主協会を出学術課題とな) Link to references and

cited articles

#### CiNii Books —Searching for books in university libraries—

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 201 |                          |                       |  |
|------------------------------------|--------------------------|-----------------------|--|
| # of book and journal information  | # of holding information | # of member libraries |  |
| 10.42 million                      | 124 million              | 1,258                 |  |



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

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

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#### For Searching Japan's Latest Research Information

#### KAKEN (Grants-in-Aid for Scientific Research)

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 2013)

| Research themes |  |
|-----------------|--|
| 700,000         |  |



#### JAIRO (Institutional Repositories Portal)

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. JAIRO is also linked to CiNii and KAKEN.

### Stored content(as of March 2013)Institutional RepositoriesContents2721,530,000



### International Scholarly Communication Initiative (SPARC Japan) http://www.nii.ac.jp/sparc/en/

SPARC Japan was launched in FY2003 based on cooperation with academic societies and university libraries, and in collaboration with SPARC (USA) and SPARC Europe. The aim is to promote further dissemination of the outcome of academic and scientific research in Japan, as well as to promote the digitization and international distribution of academic journals published by Japanese academic societies, and to contribute to improvements in the international infrastructure for the distribution of academic information.

The basic plan of action for the fourth term (FY2013-2015) is to "implement open access under a framework of international collaboration, to promote the distribution of academic information, and to strengthen the ability to disseminate information." As well as promoting collaboration with university libraries and researchers, the project aims to understand the issues around open access, and to study the measures that universities should adopt.





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, 2012)

#### 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, 2012)

#### **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 (November, 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, 2012)

#### **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



#### 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.

#### Public information magazine

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

#### 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.





Progress in Informatics



#### WEB

•NII Website http://www.nii.ac.jp/en/ Please access to our website for further information

●iTunes U<sub>®</sub> 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  $U_{\rm \odot}.$ 

• Twitter http://twitter.com/jouhouken/ @jouhouken official account



### Organization

### **Organization / Staff / Budget**

#### Organization Chart

(as of April 2013)

**Director General Global Liaison Office** Research Strategy Office **Deputy Director General** Pre & Post Research Center Group Mathematical Informatics Takeaki Uno Ken-ichi Kawarabayashi Ryota Kobayashi Kunihiko Sadakane Ken Hayami Yuichi Yoshida Principles of Informatics Mathematical Logic Makoto Kanazawa Makoto Tatsuta **Research Division** Quantum Information Shoko Utsunomiya Kae Nemoto Keiji Matsumoto Information Systems Architecture Yoshihisa Yamamoto Tim Byrnes **Science Research Division** Material and Life Informatics Hiroko Satoh Asao Fujiyama **Digital Content and Media** Intelligent Informatics Ryutaro Ichise Tetsunari Inamura Katsumi Inoue Sciences Research Division Nobutaka Ono Nigel Collier Ken Satoh Information and Society Hideaki Takeda Shigeki Yamada **Research Division** Research and Development Center Network Architecture Shunji Abe Kensuke Fukuda for Academic Networks Information Network Shigeo Urushidani Yusheng Ji **Research Center for Knowledge** Computer Architecture Kento Aida Michihiro Koibuchi Hiromichi Hashizume **Media and Content Science** Software infrastructure Ichiro Satoh Soichiro Hidaka Zhenjiang Hu GRACE Center: Center for Global Research in Software Engineering Shin Nakajima Shinichi Honiden Advanced Software Science and Engineering Nobukazu Yoshioka Tomohiro Yoneda Kenji Tei **Research Center for Community Research Center** Knowledge **Global Research Center for Quantum** Foundations of Content Management Fuyuki Ishikawa Isao Echizen Norio Katayama Hiroyuki Kato Information Science Atsuhiro Takasu Akihiko Takano Kazutsuna Yamaji **Global Research Center for** Text and Language Media Akiko Aizawa Jun Adachi Keizo Oyama Yusuke Miyao **Cyber-Physical Systems** Junichi Yamagishi **Global Research Center for** Pattern Media Asanobu Kitamoto Kazuya Kodama Imari Sato Shin'ichi Satoh **Big Data Mathmatics** Akihiro Sugimoto Gene Cheung Hiroshi Mo Duy-Dinh Le Human and Knowledge Media Kenro Aihara Frederic Andres Ikki Ohmukai Organization for Value Creation in Organization for Helmut Prendinger Mayumi Bono Seiji Yamada Informatics **Organization for Science Network** and Outside **Operations and Coordination** Information Use Noriko Arai Kouichirou Ueki Noriko Kando Hironobu Gotoda Collaboration on R&D Organization for Scientific Resources Operations and Coordination Teruo Koyama Nobuhiro Furuyama Takayuki Mizuno Akira Miyazawa Science Information Yuan Sun Masaki Nishizawa Information Public Policy Hitoshi Okada Tetsuro Kobayashi Noboru Sonehara Coordination, Infrastructure & Liaison Team Academic Infrastructure Division **SINET Team** Cyber Science Scholarly and Academic SINET Promotion Office Information Division Academic Authentication Systems Office Development Library Liaison Cooperation Office Department Library Liaison Team Advanced IT Center GeNii Development Team Library Support Team Content system, Development Office **Planning Team** Planning Division International Affairs and Education Support Team **Publicity Team** Office for Social Collaboration **Collaboration Support Team General Affairs Division FIRST Support Team General Affairs Team Personnel Affairs Team Finance and Accounting Team Procurement Team** 

| Staff (as of April 2013)   |   |                     |                               |            |                         |         |                         |           |          |                    |       |
|--|---|---------------------|-------------------------------|------------|-------------------------|---------|-------------------------|-----------|----------|--------------------|-------|
|  |   | Director<br>General | Deputy<br>Director<br>General | Professors | Associate<br>Professors | Lectors | Assistant<br>Professors | Assistant | Subtotal | Other<br>Employees | Total |
| Full-time Employees  |   | 1                   | 2                             | 31         | 35                      |         | 9                       |           | 78       | 50                 | 128   |
| # of Visiting<br>Professors<br>Organization for Man-<br>agement and Outside<br>Collaboration R&D | Management and<br>Outside Collabora-<br>tion on R&D     |                     |                               | 81         | 19                      | 1       |                         |           | 101      |                    | 101   |
|  | Promoting Coopera-<br>tion with Society and<br>Industry |                     |                               | 13         |                         |         |                         |           | 13       |                    | 13    |
| Specially Appointed Professors<br>etc. (Project-based)   |   |                     |                               | 13         | 7                       |         | 7                       |           | 27       |                    | 27    |
| Support Staff  |   |                     |                               |            |                         |         |                         |           |          |                    | 249   |
| Graduate Students  |   |                     |                               |            |                         |         |                         |           |          |                    | 126   |

Budget (FY2013)

(unit: thousand yen)



#### Income 10,417,749

Staff

### Administrative Council

Discusses important matters concerning the management and operations of the NII in response to consultations from the Director General, such as the selection of the NII Director General as well as academic personnel, joint research plans and matters concerning the NII in the mid-term targets and plans of the Research Organization of Information and Systems.

### **Advisory Board**

Consists of domestic and overseas members with extensive and advanced knowledge on science information and responds to consultations from the Director General regarding issues on research in informatics and on development and construction of Cyber Science Infrastructure.

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

| Kimio Ohno        | Simio Ohno Former Deputy Director General, NACSIS,<br>Professor Emeritus, Hokkaido University |  | Former Deputy Director General, NACSIS |
|-------------------|---|--|--|
| Atsunobu Ichikawa | Professor Emeritus, Tokyo Institute of Technology   |  |  |

### Professors Emeriti (NII: National Institute of Informatics)

| Takamitsu Sawa    | Former Deputy Director General, NII,<br>President, Shiga University                                      | Haruki Ueno       | Former Professor, Principles of Informatics Research<br>Division, NII  |
|-------------------|--|-------------------|--|
| Eisuke Naito      | Former Professor, Human and Societal Information<br>Research Division                                    | Katsumi Maruyama  | Former Professor, Information Systems Architecture Science Research Division, NII  |
| Mitsutoshi Hatori | Former Professor, Multimedia Information Research<br>Division, NII, Professor Emeritus, Tokyo University | Masamitsu Negishi | Former Professor, Information and Society Research<br>Division, NII  |
| Kinji Ono         | Former Professor, Information Foundation Research<br>Division  | Kenichi Miura     | Former Professor, Information Systems Architecture<br>Science Research Division, NII Director, Center for Grid<br>Research and Development |
| Takeo Yamamoto    | Former Professor, Multimedia Information Research  | Yohichi Tohkura   | Former Deputy Director General, NII  |
|                   | and Information Science  | Masao Sakauchi    | Former Director General, NII   |
| Yasuharu Suematsu | Former Director General, NII, Professor Emeritus,<br>Tokyo Institute of Technology                       | Shoichiro Asano   | Former Professor, Information Systems Architecture<br>Science Research Division, NII   |
|                   |  |                   |  |

### History

| 1973 | October   | Ministry of Education, Science, Sports and Culture proposes an "Improved Circulation System for Academic Informa-<br>tion" 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, Sci-<br>ence, 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 Bibli-<br>ographic 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 Organiza-<br>tion 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.   |
|      |           | The Academic Information Infrastructure Open Forum is established  |
| 2010 | February  | The first NII Shonan Meeting takes place.  |
| 2011 | April     | Science Information Network (SINET4) is Jaunched   |
| 2011 | April     | The Library Liaison Office is established  |
|      | November  |  |
| 2012 | April     | Cityli Dooks is idulicited.  |
| 2012 | Apríl     | Japanese institutional kepositories Online Cioud (JAIKO-Cioud) 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)



#### 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.





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

Akihabara Nishi Chiba *JR* (Sobu Line)

Tokvo

For Tokyo Akihabara

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

JR ( Chuo Line )

National Center of Sciences

Chiba Annex

Facade of Chiba Annex

#### 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.



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



Facade of Seminar House

### Contact info for inquiries

| Page            | Contents  | Contact  | E-mail                      | TEL          | FAX          |
|-----------------|---|--|-----------------------------|--------------|--------------|
| p.15            | Research Cooperation  | Planning Division, Office Social Collab-<br>oration, Collaboration Support Team                                | kaken@nii.ac.jp             | 03-4212-2170 | 03-4212-2150 |
| p.16            | Intellectual Properties                                       | Planning Division, Office Social Collab-<br>oration, FIRST Support Team  | chizai_web@nii.ac.jp        | 03-4212-2124 | 03-4212-2150 |
| p.17            | Top SE and edubase : Education<br>Services for IT specialists | Research Center, GRACE Center: Cen-<br>ter for Global Research in Advanced<br>Software Science and Engineering | secretariat@grace-center.jp | 03-4212-2729 | 03-4212-2697 |
| p.18            | Graduate Education Activities                                 | Planning Division, International Affairs<br>and Education Support Team   | daigakuin@nii.ac.jp         | 03-4212-2110 | 03-4212-2150 |
| p.20            | NII Library   | Scholarly and Academic Information<br>Division,Support Team, Library Desk                                      | library@nii.ac.jp           | 03-4212-2142 | 03-4212-2180 |
| p.21            | International Exchange<br>(MOU)                               | Planning Division, International Affairs<br>and Education Support Team   | international@nii.ac.jp     | 03-4212-2165 | 03-4212-2150 |
| p.22            | International Exchange<br>(Shonan Meeting)                    | NII Shonan Meeting Administrative<br>Office  | shonan@nii.ac.jp            | 03-4212-2165 | 03-4212-2150 |
| p.24            | International Exchange<br>(DAAD/JFLI)                         | Planning Division, International Affairs<br>and Education Support Team   | international@nii.ac.jp     | 03-4212-2165 | 03-4212-2150 |
| p.26<br>'<br>29 | Science Information Network                                   | Academic Infrastructure Division,<br>SINET Team  | support@sinet.ad.jp         | 03-4212-2269 | 03-4212-2270 |
| p.30            | Authentication Infrastructure                                 | Academic Infrastructure Division, Ac-<br>ademic Authentication Systems Office                                  | upki-office@nii.ac.jp       | 03-4212-2218 | 03-4221-2230 |
| p.32            | Institutional Repositories                                    | Scholarly and Academic Information<br>Division, Institutional Repository Desk                                  | ir@nii.ac.jp                | 03-4212-2350 | 03-4212-2375 |
| p.33            | Catalog Information Service<br>(NACSIS-CAT/ILL)               | Scholarly and Academic Information<br>Division, CAT/ILL Desk   | catadm@nii.ac.jp            | 03-4212-2310 | 03-4212-2375 |
| p.33            | Education and Training  | Scholarly and Academic Information Division  | edu@nii.ac.jp               | 03-4212-2177 | 03-4212-2375 |
| p.34            | CiNii   | Scholarly and Academic Information<br>Division, CiNii Desk   | ciniiadm@nii.ac.jp          | 03-4212-2300 | 03-4212-2370 |
| p.35            | SPARC Japan   | Scholarly and Academic Information<br>Division, SPARC Desk   | sparc@nii.ac.jp             | 03-4212-2351 | 03-4212-2375 |
| p.36            | Public Relations / Media Relations                            | Planning Division, Publicity Team  | kouhou@nii.ac.jp            | 03-4212-2145 | 03-4212-2150 |
| p.42            | Facilities / Location   | General Affairs Division,<br>General Affairs Team  | soumu@nii.ac.jp             | 03-4212-2000 | 03-4212-2120 |



Informatics is a new academic discipline that provides a foundation to support society. NII publishes *NII Today* for the purpose of broadly and simply informing general readers how informatics research changes the society in which we live and what new value it brings to future society.

#### NII Today issues from June 2010 to the present



No.34, July 2010 Language -Using language as knowledge-



No.38, July 2011 SINET4 -The Next Stage of Information Lifelines-



No.42, July 2012 The Academic Cloud



No.35, October 2010 Artificial Intelligence -From Personal to Societal Knowledge-



No.39, October 2011 Information and Human Society -The New Relationship Between Society and Media-



No.43, October 2012 Multimedia Sensing



No.36, December 2011

Grid X e-Science

-Connecting Data, Harnessing Data-

No.40, December Green Innovation through ICT



No.44, January 2013 GakuNin Academic Access Management Federation



No.37, April 2011 Security -Towards a Safe, Secure Society-



No.41, April 2012 Web Data-Driven Information Flow



No.45, April 2013 The New World Being Created by Ultra-High Speed Database Engines

*NII Today* back issues are available for reference and can be downloaded at: http://www.nii.ac.jp/en/about/publications/today/

