National Institute of Informatics News

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

Theme Book Map
http://shinshomap.info/

Theme Bookshelf
http://bookshelf.shinshomap.info/

Cultural Heritage
http://bunka.nii.ac.jp/

JIMBOU
http://jimbou.info/

JIMBOU NAVI
http://navi.jimbou.info/

Book Review Map
http://senya.pictopic.info/

Association Press
http://rensou.info/

Associative Engine Changing Information into Insight

Creating Future Value with Informatics Based on a New Research Structure

Greeting from the Director General

Masao Sakauchi (Director General, NII)

2005 H-10 Information-Accessing Techniques in a Multiple Media Environment
2006 H-13 Media Analyses from Social/Cultural Perspectives and Study/ Modeling of the Effects of the Media in Society

Joint Research No.12

Masashi Inoue (NII)

Creating Future Value with Informatics Based on a New Research Structure

Masao Sakauchi
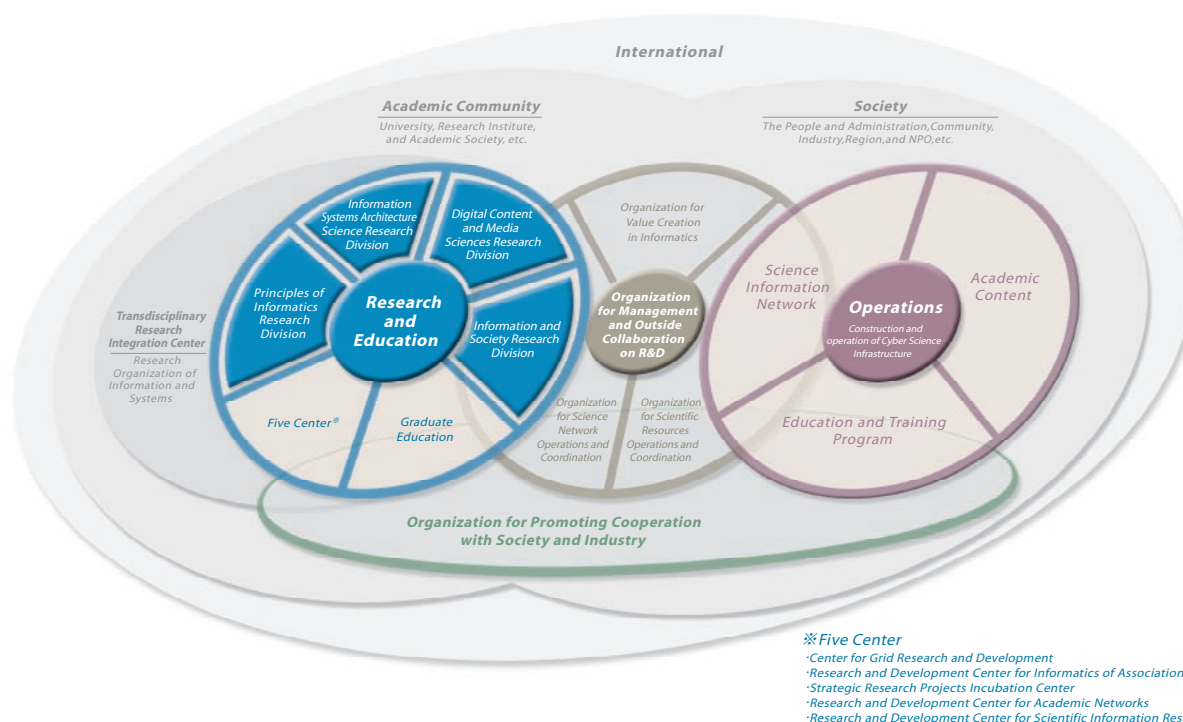### Director General, National Institute of Informatics

1. Informatics meets the needs of the times

Since its foundation, the National Institute of Informatics has pursued comprehensive research on informatics topics with a structure of seven research divisions and two research centers. But with dramatic changes in the information-oriented society and the surrounding environments, the need has emerged for a research system capable of responding more effectively to emerging social demands. In April 2006, we reorganized the NII research structure, duly emphasizing, as the national center of informatics, (1) enhanced features related to "creating various future values through informatics" and (2) enhanced features of coordination for expedited and focused development of the "Cyber Science Infrastructure (CSI)" as the "state-of-the-art academic information infrastructure."

2. For strategically stronger research promotion

(1) The research divisions have been reorganized into four new divisions (Principles of Informatics Research Division, Information Systems Architecture Science Research Division, Digital Content and Media Sciences Research Division, and Information and Society Research Division). The goal is to facilitate future value creation by enhancing/reinforcing comprehensive and systematic research on informatics from mid-to-long range perspectives.

(2) With the goal of enhancing and reinforcing the system for promoting the state-of-the-art academic information infrastructure and the mid-to-long range priority projects through collaborative efforts with Japanese universities and research institutes both in Japan and abroad, and to exert a unifying force as a national center, we have established the Organization for Management and Outside Collaboration on R&D (comprised of the Organization for Science Network Operations and Coordination, Organization for Scientific Resource Operations and Coordination, and Organization for Value Creation in Informatics).

(3) Project-specific centers will be established according to specified timeframes for research projects with clear and specific missions, goals, and promotion plans, including priority projects to receive external funding, thereby providing systematic research support.

Based on the above research system guided by the principles of competition and collaboration, we plan to promote research to create value with informatics.

※Five Center
・Center for Grid Research and Development
・Research and Development Center for Informatics of Association
・Strategic Research Projects Incubation Center
・Research and Development Center for Academic Networks
・Research and Development Center for Scientific Information Resources

Special Article

2005 H-10
Information-Accessing Techniques in a Multiple Media Environment

2006 H-13
Media Analyses from Social/Cultural Perspectives and Study/Modeling of the Effects of the Media in Society

Alternative media and sociology/informatics

This study is a joint project with Mr. Koichi Yawata of the Graduate School of Hokkaido University. By focusing on the use of new, or alternative, media as a replacement for conventional mass media, the study is aimed at establishing a method of quantifying the social significance and effects of media used by the socially disadvantaged, particularly ethnic minorities. The study is intended to present a new approach to media studies, one that can supplement the perspectives and approaches conventionally used in sociology and informatics, and simultaneously to investigate potential media management methods in multi-cultural, multi-media social environments.

Conventional media studies

While conventional media research has handled the "audience" from the perspective of strata comprised of ages and educational backgrounds, they have failed to pay close attention to diversity and to social/cultural differences within each stratum. On the other hand, ethnic media and cultural studies have focused on diversity and the social backgrounds of the audience, but many of these studies have been mainly fact-finding efforts— far from empirical analyses that would incorporate the perspectives and approaches of informatics. Against this background, this research focuses on TV broadcasts by the indigenous population in Canada, conducting comparative analyses of news programs of representative broadcasting stations (both public and private) and those of an indigenous broadcasting stations, while giving proper attention to both diversity and other empirical aspects within the audience strata. The study is thus intended to clarify the characteristics of alternative media used by indigenous people and to attempt to construct a model for evaluating the social significance and effects of these characteristics.

Contribution to public policies

This study has been initiated, and should be evaluated, not only from an academic standpoint but also based on its potential contribution to public policy. For example, if the workforce continues to decline with diminishing birthrates and a growing aging population, Japanese society may find itself willing to accept immigrants. These immigrants of different social backgrounds may, irrespective of their linguistic capabilities in Japanese, have different approaches to media or different propensities toward media consumption relative to those of the Japanese. In addition, as communication environments and video technologies and devices become increasingly sophisticated and less expensive, it will not be difficult for these immigrant communities to operate their own broadcasting stations. The government may be required to support these alternative media in order to promote a multi-cultural society. This study is intended to provide an academic foundation for assessing the relationships between the audience's social/cultural backgrounds and a range of relevant factors—including media contacts, message consumption and delivery characteristics—and thus offers the potential to contribute to the design of the social systems that will be required in a diversifying media environment.

*(**Masashi Inoue**, Assistant Professor, Digital Content and Media Sciences Research Division)*

Scientific Methods for Software Development

As software is pervasive to the social infrastructure to have much impact on our daily life, the assurance of its quality is highly concerned. Ensuring the correctness of the software has long been a matter of the developers. It will, however, attract the general users' attention whether a software system is attached with a warranty card. The software developers need to show that the project management is adequately done in a systematic way and further that each individual task is of a high quality. Using formal methods, the software development methods with the mathematical science as their basis, is supposed to be the evidence of the high quality in the software industry.

Formal methods have a long history of about 40 years since the early 1970's. One of the primary concerns is the use of the formal verification techniques to check whether the target system has certain faults. After the theoretical research over the period, the technology is now matured enough to be used as the tools in the software development. Now, new types of software such as Web services and the embedded systems come on the stage. How the classical formal methods can be used is an important research topic in order to have the maximal benefit of the technology. Actually, the automatic verification method using the model-checking of concurrent systems is turned out to be applicable and effective.

Web service is an emergent software infrastructure using the Internet technology. WS-BPEL is proposed as a standardized language for the robust framework to compose a new service from the existing building blocks.

Message from Foreign Researcher

Project researcher, Research Center for Testbeds and Prototyping

Muljadi Hendry

2001	Master degree (Engineering), Dept. of Mechanical Engineering, Graduate School of Engineering, Shibaura Institute of Technology
2004	Ph.D.(Engineering), Graduate School of Engineering, Shibaura Institute of Technology
	From April 2004, NII Researcher

I came to Japan for the first time in March 1994. I am from Indonesia, but is a made-in-Japan's researcher. During my graduate course of studies, I specialized in Production Systems, particularly in the integration of design and manufacturing. I submitted my doctoral dissertation, entitled "A Study on Manufacturing Feature Recognition Method," and obtained the Ph.D. in March 2004.

Since April 2004, I joined the Bioportal Project (director: Prof. Fujiyama). In this project, I was working with Prof. Hideaki Takeda to develop a Semantic Wiki (the prototype system: http://www. semanticwiki.jp). Semantic Wiki is a user-friendly software that hopefully may bridge the gap between non-technical users and Semantic Web. Semantic Wiki is also characterized by its capacity to manage both content and metadata simultaneously. Currently, I am working with the implementation of the Semantic Wiki.

I am truly grateful for the research and learning experiences provided by NII over the past two years. Since April 2006, I have been affiliated with the Transdisciplinary Research Integration Center at the Research Organization of Information and Systems.

Since a WS-BPEL program is essentially a description of a distributed collaboration of the independent Web services, its correctness is not easy to show. A WS-BPEL program may have such faulty behaviors as a sudden termination due to a deadlock or the leakage of the secure documents. The devised method extracts the behavioral specifications from the WS-BPEL program by identifying its control flows and then uses the model-checking technique for the analysis of the extracted ones to check whether the program has certain faults.

Apparently any one method is not a panacea since software is of a wide variety. Formal methods are also various; each has its own place due to its differing mathematical characteristics. An examination or a form of consulting to choose the right method for the particular software is important. In addition to the study on the scientific aspects, the research on formal methods is supposed to take a step towards the knowledge accumulation in which a collection of a particular case with the accompanying method of the treatment is found.

Reference:

S. Nakajima : Lightweight Formal Analysis of Web Service Flows, Progress in Informatics, No.2, pp.57-76 (2005).

(Shin NAKAJIMA, Professor,
Information Systems Architecture Science Research Division)

NII *Message from NII Researcher*

Associate Professor (by Special Appointment)

Nobukazu Yoshioka

1998	School of Information Science from Japan Advanced Institute of Science and Technology, Ph.D.
1998-2002	Toshiba Corporation, Japan
2002-	Researcher in NII
2004-	Research Associate Professor in NII

After I got a Pd.D. by my doctor thesis on a software design method, I have been researching in agent technologies. Since 2002, I have been a researcher in NII to refine and develop our agent technologies. In detail, we started Smartive project, which realizes flexible and safe distribution of contents by applying our technologies. In this project, we're developing an agent framework and experimented to evaluate the framework in the field. The aim is not only to build new technologies for next generation but also to make a business story to spread the technologies in collaboration with universities and industry partners. To make a plan of the project and to join it are meaningful for me, so that I gained a great deal from it as a researcher. One of aims of NII is to develop technologies for beyond 5 or 10 years and to promote the effective use of the results in partnership with industry, government, and academics. So, NII is one of ideal places for me, because I'd like to develop useful future technology, although it is difficult to propose such future research in companies.

Now I'm also a member of Top SE Project, the aim of which is to develop an education program for top software engineers who can apply high technology to practical development of products. It is true I'm busy, but I enjoy my full research life at NII.

Smartive Project: **http://smartive.jp/**
Top SE Project: **http://topse.jp/**

National Institute of Informatics Commencement Medal Presentation Ceremony

A commencement medal-awarding ceremony was held on March 28 at the National Center of Sciences for students completing their Ph.D. course of study and graduating from the Department of Informatics at the Graduate University for Advanced Studies as of March 2006.

This ceremony recognized student efforts and achievements in their degree work by presenting commemorative medals, which were presented to six students: two Japanese and four from overseas. One student in this group was active in the workforce during degree work.

The graduates, Dr. Sakauchi (Director General of NII), key faculty members, and academic supervisors all wore academic gowns for the ceremony. Following a brief presentation of the student's academic achievements, Dr. Sakauchi presented a medal to each graduate under the watchful eyes of family members, NII staff, and current students. Dr. Sakauchi gave a congratulatory address to conclude the ceremony.

The ceremony proceeded in solemn fashion.

On Friday, March 24, before the awarding of the medals, a commencement ceremony was held at the Headquarters of the Graduate University for Advanced Studies in Hayama-machi, Kanagawa Prefecture.

(Research Cooperation Division)

Commencement medal presentation ceremony at the National Center of Sciences

Thirty New Graduate Students Accepted in Year 2006

In April 2006, the Department of Informatics in the Graduate University for Advanced Studies launched a Five-Year Regular Master/Ph.D. Course to allow students to obtain their doctorate in five years. A total of nine new students were enrolled in April 2006: eight for the conventional Ph.D. course and one for the five-year master/Ph.D. course. An orientation session for new students was held on Monday, April 10, at the NII premises.

The session began with self-introductions, followed by a talk on how to sign up for courses and obtain credits and on the overall academic guidance/supervision system. After the session, new students were treated to a welcome party at the third-floor cafeteria, attended by Director General

Sakauchi, faculty members, and current students. The current enrollment for the Department of Informatics in the Graduate University for Advanced Studies stands at 60 (including 18 overseas students)

Twelve new students have also been accepted as

Orientation session for new students in the Department of Informatics at the National Institute of Informatics

students of collaborative graduate universities – from the Graduate School of Information Science and Technology, the University of Tokyo, and nine special joint research students from five graduate schools, including Chiba University and Tokyo Institute of Technology.

As of April 2006, a total of 118 graduate students studied under the academic and research guidance of the Institute.

(Research Cooperation Division)

Message from Graduate Students

Ved P. KAFLE

Ph.D. Student
Department of Informatics
The Graduate University of Advanced Studies (Sokendai)

I am in the third (final) year of my study for a Ph.D. degree. Since October 2003, I have been doing researches in the field of communication networking under the supervisions of Prof. Shigeki Yamada and assistant Prof. Eiji Kamioka at the National Institute of Informatics (NII). My research interests include the design and evaluation of communication protocols for heterogeneous mobile networks.

I am a foreign student coming from Nepal. I completed my bachelor's degree in electronics and communications from Punjab Engineering College, Chandigarh, India. I worked in Nepal for 5 years and then went to Seoul, South Korea to join a master's degree program at the school of computer science and engineering at Seoul National University. While I was in the second year of my study in Seoul, I heard about the Ph.D. program of the Graduate University for Advanced Studies (Sokendai, the acronym for the University's Japanese name) from Prof. Haruki Ueno.

NII, which hosts the Informatics Department of Sokendai, is one of the best research centers in Japan. NII is a Japanese government supported institution equipped with superb research facilities and world-class professors and researchers working in almost every field of information technology. A more interesting thing at NII is that the number of professors exceeds the number of graduate students.

Studying at NII as a graduate student has many advantages. Many professors guide a student. A student has several choices in attending classes. S/he can attend classes not only at NII but also at other Japanese universities, such as the University of Tokyo and Tokyo Institute of Technology. For foreign students, NII conducts Japanese language classes as well. For doing researches, NII has built-in facilities of real as well as testbed/prototyping systems for testing the feasibility of new research ideas. Additionally, it provides financial supports to procure computers and equipment required for experiments, or to attend international conferences to present research papers. Moreover, students are provided with chances to know the current research activities of national as well as international research communities through the conferences, joint workshops, and open house forums that are regularly held at NII. Besides study, NII has more things to offer to students. NII building itself is located in a very convenient location in Tokyo, nearby the Imperial Palace. If a student likes physical exercises or playing games such as badminton and table tennis, there is a training room in the ground floor of the building. Furthermore, if a student likes outdoor jogging, there is a 5 km long running track around the Imperial Palace, which can be reached at a 3 minutes walk from NII. I am enjoying playing badminton and jogging around the Imperial Palace in my free time. Last but not the least, the graduate students at NII, although very diverse in age, nationality, research areas, etc., are very cooperative to one another.

Report on 2005 Education and Training Programs

In fiscal 2005, NII undertook the following education and training programs in 2005:

<User Training>

NII offers database/operation training courses for those involved in NACSIS-CAT/ILL services.

Course Name	Number of trainees	Number of applicants	Venue	Number of sessions
NACSIS-CAT Training Course (Book Course)	165	211	NII	5
NACSIS-CAT Regional Training Course (Book Course)	227	255	university libraries	12
NACSIS-CAT Training Course (Serial Course)	102	234	NII	3
NACSIS-CAT Regional Training Course (Serial Course)	16	22	Kyushu University	1
NACSIS-ILL Training Course	101	183	NII	3
NACSIS-ILL Regional Training Course	33	36	Okayama University	1

With assistance from participating universities, we accepted a total of around 650 trainees.

While the 2004 regional training courses included book courses only, one regional serial training course and one regional ILL training course were held in 2005, in view of the competition for admission at the NII venue.

<Advanced Training Programs>

NII provides opportunities that allow key academic research support staff to learn the latest specialized and advanced technologies.

Program Name	Number of trainees	Number of applicants	Venue	Number of sessions
NACSIS-CAT Advanced Training Course	16	19	NII	1
Academic Portal Training Course (First half held at NII jointly with Karuizawa Information Processing Seminar)	70	74	Nagoya University/NII	2
Academic Information Literacy Training Course	100	125	Osaka University/NII	2
Seminar for University Librarians	96	109	Kyoto University/ the University of Tokyo	2
Karuizawa Information Processing Seminar (First half jointly held with Academic Portal Training Course)	7	7	NII/National Women's Education Center	1
Information Security Training Course	55	56	External (Tokyo/Osaka)	2
Network Security Training Course	40	49	External (Tokyo/Osaka)	2
Network Administration Training Course	65	69	External (Tokyo/Osaka)	4
NII Practical Training Course	1	1	NII	1

To develop human resources capable of functioning as an operational core for the academic information network infrastructure, one trainee dispatched from Hiroshima University trained under the three-month NII Practical Training Course from September to December.

The following operations were also undertaken in partnership with external organizations.

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

* Distribution of SCS (Space Collaboration System) of the "Information Security Seminar" sponsored by the Ministry of Education, Culture, Sports, Science and Technology (in collaboration with the National Institute of Multimedia Education), as well as its streaming distribution

* Joint project with the "Training for Information Specialists in Japanese Studies" sponsored by the Japan Foundation and the National Diet Library

Details on 2006 training programs are provided in the Overview of Education and Training Programs will be available on the NII website on Education and Training Program (**http://www.nii.ac.jp/hrd**) and delivered to the relevant organizations.

The Education and Training website was revamped in 2006 and now offers a totally new look.

(Planning and Coordination Division)

The new NII Education and Training website

A lecture at the NACSIS-CAT Regional Training Course (at Kyushu University)

Symposium on University Electronic Authentication Infrastructure

The "Symposium on University Electronic Authentication Infrastructure - Construction of the University Public Key Infrastructure (UPKI) for implementing the Cyber Science Infrastructure (CSI)" was held at Hitotsubashi Memorial Hall on Wednesday, February 15. The Ministry of Education, Culture, Sports, Science and Technology and the university IT centers in the seven universities in Japan were partner hosts for the event.

Following opening addresses from Dr. Sakauchi, Director General of NII, and Mr. Noriyuki Matsukawa, Director of the Information Division, the Ministry of Education, Culture, Sports, Science and Technology, Mr. Shigeo Tsujii, President of the Institute of Information Security, Dr. Jiro Makino, Professor by Special Appointment (Director, Makino Law Office), and Mr. Katsuya Watanabe, Director of the Telecommunication Systems Division, the Ministry of Internal Affairs and Communications, spoke, respectively, on information security related to the construction of an electronic authentication infrastructure, legal aspects, and government policies.

Another special lecture was given by Professor Yasuo Okabe, a Visiting Professor at NII (Professor of Kyoto University) on the history, overview, and promotion plans for UPKI development works in light of CSI and the importance of joint efforts among universities.

This was followed by a panel discussion hosted by Professor Okabe, with participants including Mr. Shin Takamura, Assistant Director of the IT Security Office, the Ministry of Internal Affairs and Communications; Mr. Yoshinori Sakai, Director of the Global Scientific Information and Computing Center, Tokyo Institute of Technology; Ms Fumiko Komatsu, NEC Senior Expert; Mr. Akihiko Kudo, Director of NTT Information Sharing Platform Laboratories; and Professor Noboru Sonehara of NII. The topics raised included proposals for UPKI development work, with due consideration of the environment for electronic authentication. Lively discussions involving the floor ensued.

The symposium attracted some 400 visitors from universities, research institutes, and companies, suggesting keen interest in the project. With this occasion as an inaugural event, we intend to more openly disclose relevant information on progress and achievements to promote further project development.

(Planning and Coordination Division)

Lecture by Mr. Tsuji, President of the Graduate School of Information Security

NAREGI Symposium 2006

The NAREGI project is continuing R&D of grid middleware for Cyber-Science Infrastructure (CSI) that supports advanced scientific research and education. Last year, we released the alpha version of our grid middleware. This year in May, we plan to release a beta version. The new beta version was the major theme at the third NAREGI Symposium, which was held on 24 February at Hitotsubashi Memorial Hall. The symposium provided an overall picture of the NAREGI science grid. Lectures and presentations featured science grid infrastructure under development at the NII, science grids formed through virtual organization (VO), grid middleware architecture, coupled simulations that use grid computing, and other topics. Demonstrations and displays were divided into grid function and grid use. Symposium participants were given a concrete look at how a science grid operates through demonstrations related to the beta version, virtual organization, and grid

computing applied to large-scale simulation.

The symposium had 357 participants, which is more than last year. The discussions were fruitful and we received many requests. Our future R&D will reflect these requests as we strive to build CSI that is easier to use and grid technology that is ready for the petascale computing research environment of tomorrow.

(Center for Grid Research and Development)

Demonstration in Exhibition site

NII International Workshop

The NII International Workshop on Cyber Science Infrastructure was held on March 21 at the Amari Watergate Hotel, Bangkok, Thailand.

Organized to promote a continuing exchange with Thai and other researchers through SINET and Super SINET, an NII network, the workshop was attended by nearly 100 researchers in information and communication technologies from Asian countries. At the start of the workshop, Director General Sakauchi greeted attendees in his capacity as organizer. Dr. Thaweesak Koanantakool, Director of NECTEC, a cooperative organization of NII, also gave an opening address, followed by a signing ceremony for an MoU on research collaboration.

The subsequent keynote address delivered by Dr. Shigeki Goto, professor at Waseda University and NII visiting professor, addressed the topic of "Social Transformations and The Internet." Researchers from NII and other organizations gave presentations. Researchers from various research institutes also attended a panel discussion.

(International Affairs Division)

MOU Signing Ceremony of NII and NECTEC

Topics

The Fifth International Symposium, "Intelligent Information Distribution for Promoting Science and Culture"

The Fifth International Symposium, entitled "Intelligent Information Distribution for Promoting Science and Culture," was held at Hitotsubashi Memorial Hall on Monday, March 27, 2006, under the sponsorship of the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Internal Affairs and Communications, Digital Eizou Common Specifications Development Project, Center for Collaborative Research,

The University of Tokyo, and Nippon Telegraph and Telephone Corporation. The symposium consisted of lectures from such diverse perspectives as information technologies, art and culture, and legal systems, as information-based societies confront various problems involving adding added value to information and streamlining its distribution.

The keynote addresses for Session 1 were delivered by Professor Lawrence Lessig of Stanford Law School, who gave a talk entitled "Creative Commons and Free Culture"; by Dr. Makoto Nagao, President of the National Institute of Information and Communications Technology, who spoke on "Progress for Power of Culture Information Transmission by ICT"; and by Dr. Paul Gerhardt, a director of the BBC, who spoke on the topic of "Creative Archive."

With the theme "Future Pictures of Information and Society," Session 2 consisted of lectures given from the perspectives of digital technologies, broadcast culture, education and culture, science and culture, and legal systems.

Later, a panel discussion was held to deliberate on information transmission and technology-driven cultural developments (coordinated by Dr. Tohkura, Deputy Director General of NII) and thereafter Q&A session was conducted for more than 500 audiene members in attendance.

(International Affairs Division)

Opening address by Dr. Sakauchi, Director General of NII

The symposium in the Hall

Professor Lessig delivering lecture

Panel discussion featuring a lively exchange of opinions with workshop attendees

A Lecture Commemorating the Awarding of a Medal with Purple Ribbon to Professor Yoshihisa Yamamoto

A lecture was held in the conference room on the 12th floor of the National Institute of Informatics on Tuesday March 28, 2006, to commemorate the awarding of the Medal with Purple Ribbon to Professors Yoshihisa Yamamoto award by the Japanese government.

Entitled "Frontiers and Future Prospects for Quantum Information Technologies," Professor Yamamoto's talk addressed recent trends in and the future outlook for quantum information technologies, particularly quantum and classical spheres, quantum cryptography, quantum repetition, quantum simulation, and quantum computers. Professor Yamamoto is a leading world figure in this field, having developed fundamental technologies in the fields of quantum optics, mesoscopic physics, solid magnetic resonance, and quantum information. The lecture was delivered to an attentive audience of around 120 attendees.

A commemorative party at Josui Kaikan Hall following the lecture was attended by around eighty guests and concluded with rousing success.

Representing a signal honor – not only for Professor Yamamoto, but for NII – this award is expected to contribute significantly to our future development, as well as serving as an inspiration to fellow researchers.

(General Affairs Division)

National Institute of Informatics Public Lectures 2005, "Eight words to discuss Informatics"

The sixth Lecture: Monday, December 19, 2005

Cyber society – Can we avert the dangers inherent in a convenient Cyber Society? –

Associate Professor, Information Institution Research,
Social Information Research Division

Hitoshi Okada

2000:	Doctor of International Public Policy at Osaka University, School of International Public Policy
1999-2000:	Osaka University, Assistant Research Fellow at the Donation Course of Personal Finance Service Research.
2000-present:	National Institute of Informatics, Associate Professor
Research fields:	Information Institution Research, Electronic Money Systems, Regional Information Policy

The cyber society, which appeared as a new space on the Internet, is becoming more and more convenient. However, such a convenient space in which we can do anything we want could be a dangerous place where we might get involved in a lot of trouble. In this lecture, I discussed how we could enjoy these conveniences while averting the dangers inherent in the cyber society.

Today, the Internet provides a place not only for work and research but also for shopping at virtual stores where, for example, we can get fresh foods from all over Japan via our home PCs. For virtual shopping, many methods of electronic payment, which are easier and more convenient

than cash transactions, have been devised. Recently, the number of virtual shops that have introduced electronic-money systems based on IC cards has increased. Furthermore, real shops where we can use a cellular phone as a substitute for our purses are becoming common across Japan; thus, the network of the digital economy has spread not only in cyber space but also in the real world.

The shops in cyber society have a very good memory: computers in the shops remember what kind of products customers bought before and, according to their shopping preference, find them other products they might want. If customers want to order one of these products, they simply click on the "electronic money" icon to their computers, payment will be done, and the product will be delivered to them. It is very convenient, isn't it? This electronic money system seems to have only good aspects. However, it actually also has bad aspects, because it remembers the behavior of customers precisely for years.

It is therefore necessary to keep the best balance between rules to protect personal data from improper use and services to utilize personal data according to a customer's requests. This balance can only be achieved by collaboration between the technology to realize new services and the legal system to support it.

In the lecture, I also explained the future picture of the cyber society, introducing a variety of efforts to make the Internet more convenient and safer.

(Publicity and Dissemination Division)

The 7th Lecture: Thursday, January 19, 2006

Affordance – What is the impact of this new idea on human-machine symbiotic system? –

Associate Professor, Cognitive Science Research, Foundations of Informatics Research Division

Nobuhiro Furuyama

Ph.D. in Psychology (The University of Chicago)
1987-1991   School of Human Science, Waseda University
1991-1993   Master Course, Graduate School of Human Science, Waseda University
1993-1994   Ph.D. Course, Graduate School of Human Science, Waseda University
1994-2001   Ph.D. Course, Committee on Cognition and Communication, Department of Psychology, Division of Social Sciences, The University of Chicago
2001-   Associate professor, Cognitive Science Research, Foundations of Informatics Research Division, National Institute of Informatics
2002-   Joint appointment as associate professor with Department of Informatics, The Graduate University for Advanced Studies
Research fields: Psycholinguistics, Cognitive Psychology, Ecological Psychology

The idea of "affordances, " which may not sound very familiar to many readers, has gradually acquired serious attention from researchers in different disciplinary fields in which the human and/or animal body is of central importance. The term "affordance" was initially coined by a psychologist, James J. Gibson, who addressed the question of how perceptual information constrains action. It derives from the English verb to afford and refers to opportunities of actions provided, or "afforded," to animals by the environment; "affordances" are what we can do in a given environment. For example, when a certain gap in the environment allows us to pass through it, the gap is said to afford passing through. What makes the idea of affordance unique and interesting is that it is argued to be directly specified by invariant information that persists over animals' movement (e.g., over changes in the visual angle in the case of visual perception), and not by reasoning or inference based on meaningless unorganized and, often, static stimuli. In this regard, the idea contrasts starkly with the classical cognitive explanation of perception, which posits that it is the perceiver, or the central nervous system, that gives the meaning to the environment. In the lecture, I described these basics of affordance theory with as many examples as time allowed and discussed the theory's implications for human-machine symbiotic systems with a special emphasis on human-machine communication, e.g., how reality can be shared by different individuals, living or artificial.

(Publicity and Dissemination Division)

8th Lecture: Monday, February 13, 2006

Quantum Computer – Why is the quantum mechanical world so weird? –

Associate Professor, Cryptography,
Infrastructure Systems Research Division

Kae Nemoto

Kae Nemoto gained a Ph.D in Physics at Ochanomizu University in 1996. After her Ph.D, she moved her research base to Australia and then to the United Kingdom. In 2003 she joined the National Institute of Informatics as an associate professor. In July 2005, she announced a new scheme for all optics quantum computation with colleagues from HP Labs in Bristol. Two months later she further announced "qubus computation" as a fundamental technology for quantum information processing. Her research fields are quantum information and computation and theoretical physics.

In the last few decades, the development of our computer technology has been remarkably fast, the speed of CPU has doubled every 18 months. To achieve this, inside of the computer all of the components became smaller and more integrated. This acceleration in downsizing in computational components will bring computational structure to the nano-level in the near future. In such a small scale, however, it is well known that systems behave quantum mechanically. Unfortunately, in the quantum mechanical world, our common sense is not so useful. For instance, it is trivial that a coin should either show head or tail, but never show both at the same time. However a quantum coin can be in a state of head and tail at the same time, which is called "a superposition state". This public lecture focused on the weird nature of quantum mechanics and explained that such weirdness can be useful to perform secure communication and ever faster computation.

(Publicity and Dissemination Division)

Intellectual Property Center News

Internet and Trademark

The relationship between domain-names and trademarks on the Internet has been discussed in connection with the fraudulent acquisition of domain names. Since domain-names are registered according to the first-to-file system, independent of trademarks, domain names containing well-known trademarks have been obtained for fraudulent use in a number of criminal cases. The Unfair Competition Prevention Law was amended in 2001 in response, following the establishment of a system for international arbitration. However, conflicts and problems involving uses of letters, etc. closely associated with trademarks belonging to other parties still arise on the Internet.

While names are assigned to newly developed technologies and initiatives in research and development phases, they are treated differently from trademarks. Trademarks are marks comprised of letters and symbols, etc. given to distinguish products and services traded. In contrast, the names of technologies are assigned prior to the identification of such products and services. However, as such products or services are put into practice, their names are often used for offering services, etc. If such names are inadvertently used on the Internet without first confirming the existence of trademarks owned by other parties, legal problems may result. Our advice is to avoid using names publicly without a careful preliminary review.

(Intellectual Property Strategy Headquarters)

Associative Engine Changing Information into Insight

Popular acceptance of the Internet means we now routinely use vast amounts of information. The Research and Development Center for Informatics of Association of the National Institute of Informatics is currently working on GETA, an associative calculation engine that performs high-speed calculations for content-based relevance to enable effective handling of enormous information volumes.

This technology makes it possible to transmit various information, including bibliographical information from libraries, information on old books in second-hand bookstores, book reviews and guides, and information on the collections held by various museums and art galleries. The project is based on the belief that the association of different types of information across diverse fields may result in the emergence of insightful information contexts.

Detailed information on the research and projects of NII is available at our Website.

▶ **http://www.nii.ac.jp/**