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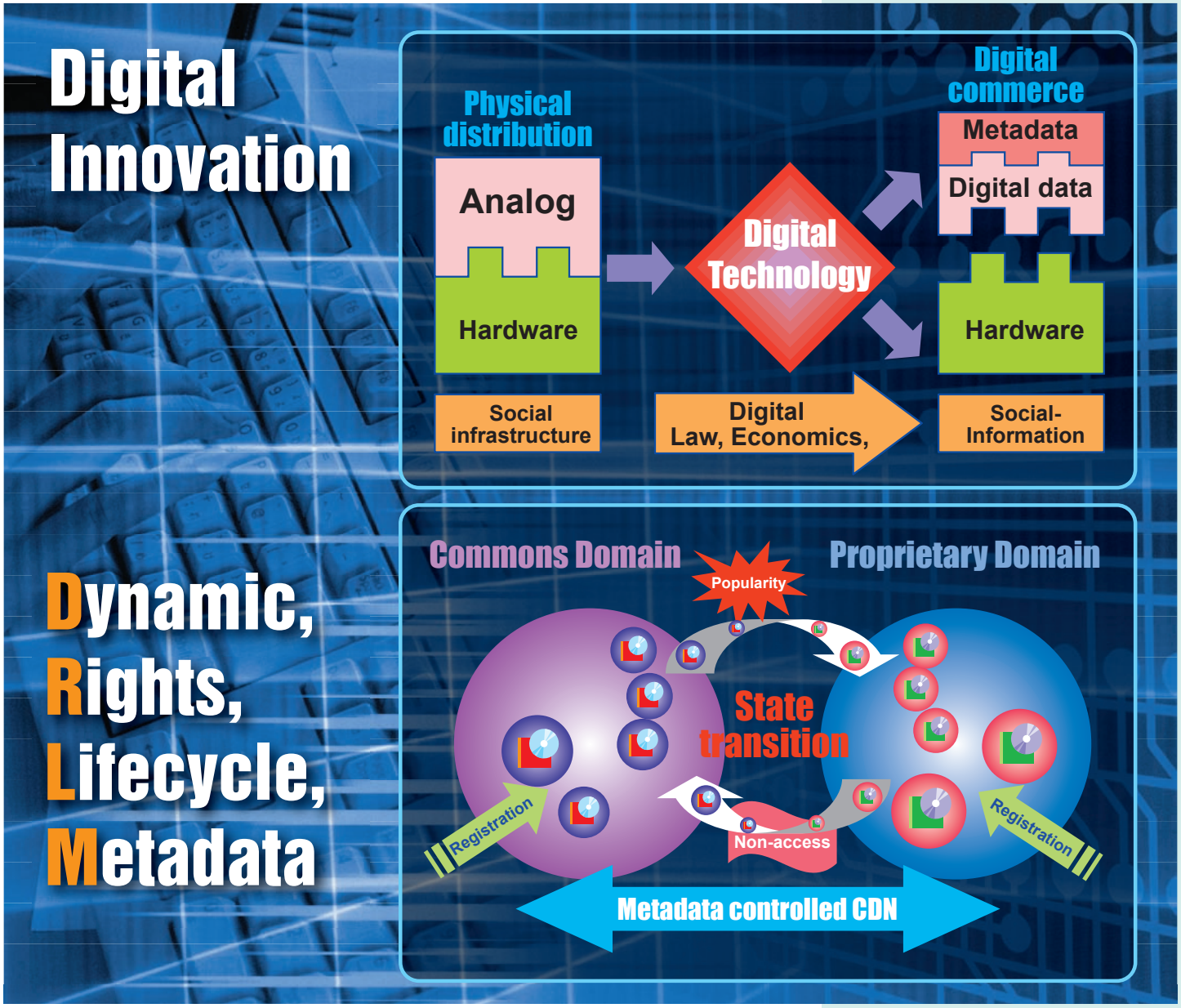


Digital rights lifecycle metadata management system: a mechanism for increasing the ratings of highly evaluated commercial content

Focus in Natural Language

Collaborative Research

Human language is a manifestation of a brain function, but the principles governing human language and those of other closely related aspects of human cognition are far from fully understood. Linguistics is the scientific study of human language whose goal is to uncover these fundamental principles.

Linguistics consists of various types of research. It studies both regularities within a single language (such as Japanese) and regularities that are found across different languages (such as Japanese and Korean). The subfield of linguistics called "semantics" studies the system of rules that determine the meanings of sentences.

Many factors contribute to the determination of the meaning of a sentence. Foremost among these are obviously the choice of words comprising the sentence and how they are arranged. But there is another important aspect of the sentence's form that affects meaning, namely, "prosody"—the pattern of stress and intonation. The systematic contribution that prosody makes to meaning is not well-understood, but is of increasing interest among linguists.

One widespread phenomenon where the semantic significance of prosody is clearly visible is "focus". In linguistics, the term "focus" refers to a certain part of the sentence that receives prosodic prominence, which has the effect of making that part salient in the information conveyed by the sentence. The following English examples illustrate this notion:

(1) I introduced BILL to Sue
(2) I introduced Bill to SUE
(3) I only introduced BILL to Sue
(4) I only introduced Bill to SUE

In each of these sentences, the capitalized word is the focus and is pronounced with a pitch accent and heavy stress. Note that examples (1) and (2) are identical except in the placement of focus, and the same goes with examples (3) and (4). In example (1), the focus is on *BILL*, and in example (2), it is on *SUE*. The effect of the different placement of focus is that (1) can be an answer to the question (5), but not (6), while the opposite is the case with (2):

(5) Who did you introduce to Sue?
(6) Who did you introduce Bill to?

In examples (3) and (4), the effect of the focus shows up in what the sentences mean. (3) means that Bill is the only person I introduced to Sue, while (4) means that Sue is the only person I introduced Bill to. In cases like these, we say that the particle *only* "associates with" the focus—*BILL* in (3) and *SUE* in (4). Focus is an important topic in theoretical linguistics because it is a prime case that shows how intonation affects the interpretation of the sentence. In this joint research, we investigated phonological and semantic/pragmatic properties of focus in English, Japanese, and other languages from various angles. One important phenomenon that the project studied in depth is illustrated in the two-sentence discourse (7):

(7) a. Many people only drank water.
b. Even JOHN only drank water.

In both sentences in (7), the particle *only* associates with *water*, but the focus *water* in (7b) does not receive a stress or pitch accent, unlike the foci in the earlier examples. Such a case of focus is called a "second-occurrence focus," because it seems to be related to the fact that the same focused phrase occurs earlier in the discourse. But if the focus does not receive stress or pitch accent, can one really recognize it when one hears a sentence like (7b)?

The answer is that one can. It is now well-known through the work of project member David Beaver and others that these apparently inaudible foci are in fact prosodically marked and thus actually audible, albeit in a more subtle way than normal foci: they are marked not by pitch, but by lengthening.

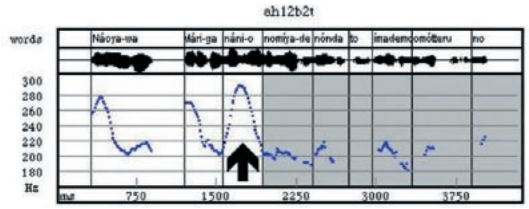
As we have seen, the relation between the type of focus and the way it is prosodically realized is not simple. An important goal of the research on focus is to develop a theory that explains this correlation. In this sprit, project member Daniel Büring proposed a theoretical framework to predict when the prosodic prominence of a focus may or must be reduced. Briefly,

a) Each focus comes with a "domain" and must be maximally prominent within its domain.
b) When the domain of one focus is contained within that of another, the former must be less prominent than the latter and hence reduced.
c) Foci that give answers to questions or corrections, as well as "contrastive foci", must have the largest domain and thus cannot be reduced.

Project leader Christopher Tancredi studied cases like (12), which are problematic for Büring's theory:

(12) People who grow rice generally only EAT rice

Here, *only* associates with *rice*, but *EAT* is more prominent than *rice* in the domain of the latter, which is *only EAT rice*. That is to say, principles (a)-(c) do not apply to this case. This led Tancredi to propose a scheme that accounts for the correlation between different types of interpretation of focus and different types of pitch accent. These are but first steps toward a satisfactory theory of the relation between the prosodic realization of focus and the range of its possible interpretations. Many questions and problems remain, and it is important to address them and find solutions. Efforts along this line are essential for the advance of the scientific study of language as a manifestation of a brain function.



*(**Makoto Kanazawa**, Associate Professor, Principles of Informatics Research Division)*

Pill bugs: Are they intelligent?

Research Intoroduction

1. Ecological approach to human and animal behavior

Our research project basically attempts to elucidate the cognitive processes underlying human communicative behavior by looking at how speech and gestures coordinate with each other in timing as well as in meaning between individuals. Among the most fundamental questions are the following: How do we learn about the environment, including other individuals to communicate with, without initially having any knowledge of them? How do we use information of the environment to coordinate with it and, particularly, other individuals? How do we share information about the environment with other individuals of the same (or even different) species? With these questions in mind, we have collected and analyzed data from the viewpoint of ecological psychology. Recently, we were joined by Dr. Toru Moriyama from Future University-Hakodate, who has started to apply the implications of the present approach to studies on animal behavior. In what follows, we will introduce Dr. Moriyama's interesting study on the behavior of pill bugs.

2. Are pill bugs intelligent?

Dr. Moriyama has chosen pill bugs (*Armadillidium vulgare*, Isopoda, Crustacean), the species known as *Dango Mushi* in Japan, as the subject of his study. Few people would think that these little creatures are intelligent. Contrary to this common assumption, Dr. Moriyama has demonstrated the cognitive ability of the bugs in a series of innovative experiments*. In one of the experiments, the bugs were put on an annulus-shaped (or, ring-shaped) plate, the two sides of which were surrounded by water. The setting was dangerous for them because they would die if they fell into water and stayed in there for a while. In addition, small cylinder-shaped obstacles were placed at regular intervals in the middle of the annulus. The bugs were initially upset and moved around almost randomly to get away from the obstacles and the water. After spending some time in this environment, however, the bugs started to use the cylinders instrumentally, i.e., as landmarks to navigate themselves along the annulus while keeping themselves away from the water. We take this as evidence of the bugs' intelligence to adjust themselves to the new environment.

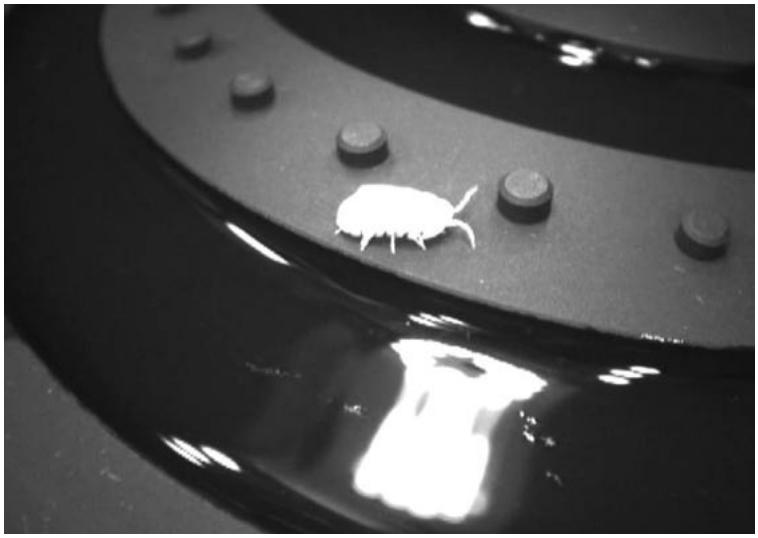
3. How do pill bugs use their antennae to learn about the environment?

How would pill bugs obtain insight to use the cylinders as landmarks, which they would usually take as obstacles to avoid? In order to understand this, we need to understand how they use the pair of antennae attached to their head. The bugs spontaneously move the antennae, touch objects with them, and obtain spatial information, which human beings obtain by vision. We put pill bugs in the same experimental setting as before and videotaped the antennae movements for two hours under infrared lighting (See the figure on the next page). The preliminary observation showed that the left and right antenna can independently draw a circle, and they make tapping and other characteristic movements. Additionally, the movements of the antennae were in synch sometimes and out of synch (or, alternating) at other times, and the two patterns were repeated in an alternating fashion. To understand more about the dynamics of their movements and how these movements contribute to the bugs' perception of their environment, we are planning to use Joint Recurrence Quantitative Analysis and the ideas developed in ecological psychology over

the years on how people perceive the world haptically. By revealing the mechanism of haptic perception in these bugs, we hope to contribute to the development of information systems that can learn and use resources in the environment.

*All studies about the cognitive ability of pill bugs are available at
http://www.fun.ac.jp/~moriyama/

*(**Nobuhiro Furuyama**, Associate Professor, Information and Society Research Division)*

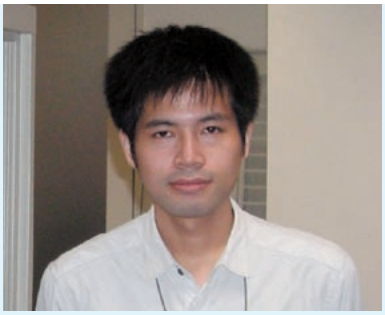


A pill bug (center) exploring with its antennae a cylinder-shaped object on the road surrounded by water. (The bug looks white because of the infrared lighting. Small cylinders are obstacles.)

NII Message from NII Researcher

Project Researcher,
Digital Content and Media Sciences Research Division

Taizo Yamada



Since April of last year, I have been taking part in research as a member of the Cross-Media Archives Querying/Integrated Software Development Project in R&D Area 2: Systems for Using Digital Archives at Educational Institutions, part of the Development Project for a Software Infrastructure to Support Digital Storage and Use of Intellectual Property subcontracted by the Ministry of Education, Culture, Sports, Science and Technology. This project involves research and development to build a software-technology infrastructure for a range of purposes, from digital storage to the use of intellectual property in the fields of education, culture, and the arts.

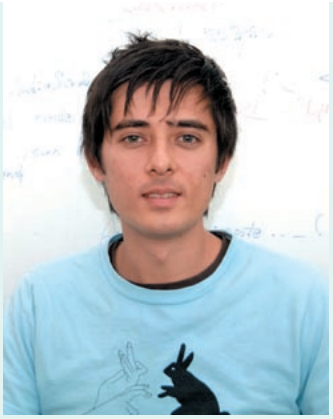
In particular, we are working to 1) realize methods of building and integrating metadata for integrated use of content relating to cultural heritage objects and 2) develop systems to support the use of digital content in education. The goal of both of these efforts is to enable the educational use of digital archives of the cultural heritage objects held by museums and other institutions. We are seeking to establish a framework to utilize digital archives for educational purposes. In addition, we are working to develop a metadata infrastructure and learning support systems, as well as to integrate a diverse range of technologies: metadata management systems, search systems, and tools for authoring educational materials, among others. In this context we are examining issues and concerns that have emerged from prototype development and experiments conducted in actual educational environments, in order to refine the applicable methodologies and software.

Personally, I have now become more interested than ever in cultural heritage objects. I would like to work to ensure that this project will result in technologies that can convey the fascination of these cultural heritage objects.

Message from Foreign Researcher

Principles of Informatics Research Division,
Foreign Research Scholars

Timothy Masami Ronald BYRNES



1999	B.Sc.(Hons.)	University of New South Wales (Sydney, Australia).
2003	Ph.D.	University of New South Wales.

My name is Tim Byrnes, I have been at NII since November 2004 in the quantum computation group led by Prof. Yoshihisa Yamamoto. I am currently employed as a JSPS postdoctoral fellow. Although I was born in Australia, I used to live in Japan when I was a child between the ages of two to seven. My mother is Japanese, so I can speak fluent Japanese. My education has been entirely in English, consisting mainly of international schools in countries such as Indonesia, the Philippines, and Hong Kong, apart from Japan and Australia. English is therefore my strongest language.

I started my research in the field of particle physics with A/Prof. Chris Hamer, who specializes in the crossover area between condensed matter physics and high energy physics. He assigned me to a project of applying a powerful numerical algorithm, called DMRG, to the problem of quantum electrodynamics in one dimension. I also applied DMRG to other problems in condensed matter physics, such as modeling mesoscopic rings with magnetic fields pierced through them such that a persistent current flows.

Currently I am working on quantum simulations with Prof. Yoshihisa Yamamoto. The idea of quantum simulations is that quantum many body problems, which are notoriously hard to solve on a classical computer, may be much more easily approached using a device that incorporates quantum physics into it. For example, by using a quantum computer, it has been shown that many quantum many body problems can be solved in polynomial, instead of exponential time and resources. My first project at NII was to see whether lattice gauge theories could also be solved efficiently using a quantum computer. This was shown to be in the affirmative. We are now working on experimentally realizable devices that can simulate Hubbard model physics. This is important from the perspective that the Hubbard model is crucial to understanding many phenomena in condensed matter physics, such as high-temperature superconductivity which could lead to the creation of many useful devices, such as extremely powerful magnets, efficient electricity distribution, and faster computers.

21st International Conference on Software Engineering

Over the five-day period from September 18 - 22, 2006, the ASE2006 conference (also referred to as the 21st IEEE/ACM International Conference on Automated Software Engineering) was held in the Hitotsubashi Memorial Hall at the National Center of Sciences, as the NII's Sixth International Symposium.

This conference is the most authoritative international conference on automation of software development in the software engineering field.

The conference is held each year, alternating between locations in the United States and those in other countries. The 2005 conference was held in California. This year's conference was the 21st.

With a greater number of participants than in the average year—a total of 223 attending the three keynote speakers and four workshops—this year's conference gathered together researchers from the front lines of the field in Europe and North America, welcoming 31

Research & Education

attendees from the United States and 46 from Europe, each of whom came all the way to Japan specifically for this conference.

Prof. Shinichi Honiden of the NII served as the General Chair of this year's conference, which was organized jointly by the NII, the IEEE, and ACM.

In addition to the keynote speakers, the conference's program consisted of 39 announcements of proposed research projects (18% of which were adopted), nine demonstrations of tools, and two brief lectures, among other events.

From the NII, Cyrille Artho gived an overview of the Top SE project as a tutorial and presenting a research paper, communicating the successes of the project to researchers from around the world.

In addition, at the opening of the conference Deputy Director General Yoh'ichi Tokura introduced an overview of the NII and of this project, communicating to researchers from the front lines of the field the value of the NII as a national research center.

*(**Nobukazu Yoshioka**,*
Associate Professor [By Special Appointment],
Information Systems Architecture Science Research Division)

Graduate Education

The National Institute of Informatics Ceremony for Presentation of the Ph.D. Conferment Commemoration Medal (September 27)

On September 27, 2006, a Ceremony for Presentation of the Ph.D. Conferment Commemoration Medal was held at the NII.

In this ceremony, Ph.D. candidates who had undergone training in the NII's doctoral program and been awarded with Ph.D. degrees from their own graduate schools were honored with the presentation of medals commemorating the conferment of their degrees. In September's ceremony, six graduating Ph.D. candidates from the Department of Informatics at the Graduate University for Advanced Studies received medals.

At the ceremony, the graduates, Director General Masao Sakauchi, core NII faculty and staff, and instructors all wore academic gowns, as a presentation by instructors on the program's performance was followed with Dr. Sakauchi handing each graduate a commemoration medal in front of their family members, NII faculty, and continuing students. Dr. Sakauchi concluded the ceremony with a congratulatory address. The ceremony was a stately one from start to finish.

(Research Cooperation Division)

Ceremony for Presentation of the Ph.D. Conferment Commemoration Medal (at the National Center of Sciences Building)

Graduate Education

Eleven new students enter the Department of Informatics at the Graduate University for Advanced Studies (October 2006)

On Monday, October 16, the Department of Informatics at the Graduate University for Advanced Studies, for which the National Institute of Informatics serves as the main supporting organization, welcomed the eleven new students (four from Japan and seven from overseas) who entered the program in October 2006, with an orientation program for the new students conducted at the NII.

The orientation for new students included personal introductions and descriptions of registration methods, the guidance structure, and other matters. After the orientation was complete, the students were taken on a tour of the Information Materials Center.

In addition, a welcome party for the new students was held in the café on the third floor, attended by Director General Masao Sakauchi and other faculty members as well as current students, graduate students from other universities undergoing training at the NII, and others.

With the addition of these new students, the Department of Informatics at the Graduate University for Advanced Studies now has a total of 64 students (21 of whom are from overseas).

As of October 2006, a total of 122 graduate students are undergoing education and training at the NII.

(Research Cooperation Division)

Department of Informatics orientation program (at the NII)

Yasushi Shinohara

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

As a student who also has a full-time job, I am currently conducting research into active learning, instructed by the NII's Prof. Atsuhiro Takasu. With the advance of machine-learning technologies, it is becoming possible to develop high-precision automatic identification systems using, for example, case databases that pair images with the results of identifying them. However, building such a case database requires asking experts for the results of identifying each image. This technology is intended to enable high-precision decision-making using a small number of examples—based on a system by which examples can be actively selected for asking experts. Currently, as part of this process we are developing technologies that will isolate specific attributes within a database that will streamline the decision-making process.

I was introduced to the NII program by a colleague who had already been admitted. The program appealed to me particularly in the flexibility of its methods and scheduling of classes and consultations with professors. I think this is true for all students who also have full-time jobs, because they face such severe time constraints. Another appealing characteristic is the large number of professors in related fields—not simply instructors from NII, but also those participating through its cooperation with a wide range of research institutions.

Today, as Japan faces shrinking numbers of skilled technicians, I would like to do my part for technology by pursuing my research and sharpening my expertise.

University Public Key Infrastructure (UPKI) Initiative begins

The NII has established the Authentication Systems Working Committee as part of the Organization for Science Network Operations and Coordination, as it works to build a University Public Key Infrastructure (UPKI) for coordination between universities, against the backdrop of efforts to realize a Cyber Science Infrastructure (CSI) framework. As part of the NII's efforts to promote development of the UPKI, the UPKI Initiative began on Thursday, August 17, for the purpose of exchanging opinions and information with a number of universities and other institutions via web-based discussion boards and mailing lists. On Wednesday, August 30, an opening ceremony was held at NII.

This opening ceremony featured greetings from Takashi Shibasaki, Director, Office for Science Information Infrastructure, Information Division, Research Promotion Bureau, Ministry of Education, Culture, Sports, Science and Technology and Director Jun Adachi of the Development and Operations Department in the NII.

These were followed by an overview of the UPKI Initiative presented by the Initiative's representative Visiting Professor Yasuo Okabe, overviews of six projects included in the Initiative presented by personnel in charge of each project, and other presentations.

This ceremony was attended by 120 faculty and staff members from universities and other institutions throughout Japan. The high interest in the Initiative was apparent from the enthusiastic questioning and exchange of opinions among representatives of universities and other institutions that had already begun UPKI efforts.

The UPKI Initiative's URL is shown below. Persons involved in building authentication infrastructures are welcome to take part in the UPKI Initiative.

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

(Planning and Coordination Division)

UPKI Initiative opening ceremony

Next-Generation Supercomputing Symposium 2006 held

Over the two-day period from September 19 - 20, the Next-Generation Supercomputing Symposium 2006: Developing New Possibilities in Science and Technology, sponsored by Riken and cosponsored by the NII and the Ministry of Education, Culture, Sports, Science and Technology, was held at MY PLAZA (Marunouchi, Chiyoda-ku, Tokyo). The symposium welcomed a total of 410 participants over its two-day run.

The morning of the first day of the symposium featured a keynote lecture from Morio Suzuki, Integrated CAE Division Manager in the Technological Development Division at Nissan Motor Co., Ltd., entitled "The Role and Future Possibilities of CAE in Automobile Development: Results of Dramatic Improvements in Computing Speed." This was followed by a policy lecture from Kanji Fujiki, Deputy Minister, Research Promotion Bureau, Ministry of Education, Culture, Sports, Science and Technology, entitled "Japan's Strategies in Supercomputing." The latter lecture discussed the need for next-generation supercomputers and Japan's strategies for meeting this need.

From the afternoon of the first day of the seminar through the morning of the second, panel discussions were held in six fields—life sciences, engineering, nanoscience/materials, environment/disaster prevention, and physics/astronomy—beginning with the discussion "User Environments: Toward a Cyber Science Infrastructure."

The afternoon of the second day featured a lecture

from invited lecturer Mr. Takashi Tachibana, entitled "Knowledge in the Petacomputing Age," focusing on the progress and objectives of supercomputer development in Japan and the United States.

The seminar concluded with a discussion among all attendees, based on a report from each panel discussion (moderator: Prof. Norihisa Doi of the Faculty of Science and Engineering at Chuo University). The main points of this discussion were summarized as follows: Japan must take on challenges in new fields and methodologies, develop strategies for application development and promotion, develop human resources, form research and development communities, and build a COE. Further, Japan must develop and organize the essential Cyber Science Infrastructure user environment, to make the most of high-performance supercomputers in each R&D field. All of these imperatives will be critical in allowing the nation to improve its competitiveness in science, technology, and in industry. This summary was greeted with enthusiastic applause at the close of the seminar.

(Planning and Coordination Division)

Greeting from Director General Masao Sakauchi

Report on Attendance at 22nd APAN Meeting in Singapore

The 22nd Asia Pacific Advanced Network (APAN) Meeting was held at the National University of Singapore (NUS) from July 17 to 21, 2006. With a large number of participants involved in the development and use of networks centered on the Asia-Pacific region, this meeting featured a number of presentations and discussions on various themes related to fields of network technologies, application technologies and so on.

A number of faculty and staff members from the NII attended the meeting. Associate Professor Jun Matsukata introduced the Next-Generation Science Information Network "SINET3" in the Network Engineering Workshop. Visiting Professor Yasuo Okabe served as a coordinator in the Grid Middleware Workshop, where Associate Professor (by Special Appointment) Toshiyuki Kataoka and Visiting Professor Shin'ichi Mineo introduced the NAREGI Project. These and other participants from the NII attracted considerable interest from attendees as they introduced the NII's activities and latest research results, centered on the Cyber Science Infrastructure (CSI).

This year marks the 10th anniversary of APAN's founding in 1996. The APAN Meeting plays an important role as a place for exchanges not just among network researchers and developers but also among advanced users of networks. This meeting also featured a ceremony commemorating APAN's 10th anniversary.

(Network Division)

Efforts toward joint establishment of a Next-Generation Scholarly and Academic Information Infrastructure

In cooperation with universities and other institutions, NII is advancing development of the Cyber Science Infrastructure (CSI). One of the foundations of this effort is the establishment and enhancement of a Next-Generation Academic Content Infrastructure, to serve as a information infrastructure for the formation, preservation, and communication of scientific content.

In addition to development of a wide range of services including NII Scholarly and Academic Information portal (GeNii), NII Repository of Electronic Journals and Online Publications (NII-REO), the Cataloging System (NACSIS-CAT), and Interlibrary Loan System

(NACSIS-ILL), this project supports the establishment and operation of institutional repositories at numerous universities.

In particular, establishment of institutional repositories to function as information-distribution centers that collect, store, and distribute the results of various types of academic research generated by each university has been advancing at a fever pitch at universities and other institutions overseas. In Japan as well, a project seeking jointly to establish and link institutional repositories has begun, with the NII and 19 universities from across Japan participating. Plans call for further increasing the number of participating universities in the 2006 fiscal year, providing support for 57 universities selected from public invitations.

The project's webpage makes available to the public case studies, expertise, and other information collected to date on establishing and operating institutional repositories.

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

(Content Division)

NII Introduction to participants undertaking the Practical Training Course

As part of its educational and research activities, the NII has now established practical Training Course. This course involves education of staff members from universities and other institutions in areas such as methods for planning, proposing, and implementing an infrastructure for distributing scientific information, providing these staff members with experience in practical operations at the NII for several months. After completion of this program, the staff members are expected to apply the results of their course in their own institutions.

This issue and the next issue of NII News will feature introductions to three Participants in this Practical Training Course in the 2006 academic year.

Yukiko Sampei

Institution:	Cataloging Information Department II, Information Systems Division, Hokkaido University Library
Period of training:	July 1 - September 29, 2006 (three months)
NII department:	Cataloging Information Management Section, Content Division, Development and Operations Department

I work at the Hokkaido University Library, primarily in cataloging. Although I refer to the NII's coding manual from day to day in my work, sometimes I felt that the manual was not well organized. For this reason, when speaking with the NII about this Practical Training Course, I expressed my desire to study the handling of audiovisual materials, which had long been a concern of mine.

This was my first time working at the NII. At first, I was mostly disoriented, doing work that was completely different from my job at a university library and in a very different environment. However, with the help of everybody in the Development and Operations Department I was able to move forward with my research every day. We held meetings to study the handling of audiovisual materials and worked together with other participants in these meetings to organize the manual.

I hope to be able to use this manual to facilitate the smooth registration of audiovisual materials while also maintaining the quality of bibliographic records.

Realization of Japan's largest electronic journal archive

On June 2, 2006, together with JANUL (the Japan Association of National University Libraries) and PULC (the Public-Private University libraries Consortium), NII started a new digital-archive collection adding 2.8 million papers. This archive is via NII Repository of Electronic Journals and Online Publications (NII-REO) provided by NII. It follows that NII archived the Japan's largest electronic journal archive containing 6.1 million papers, including electronic journals from Japan and overseas already collected by NII.

The new additions to the archive consists of 19 million pages—from the first to the most recent issues—of approximately 1,000 journals published by the two world's leading academic publishers: Springer Science+Business Media and Oxford University Press. The oldest of the newly added papers is published in 1847. These journals cover a wide range of academic fields, from humanities and social sciences to sciences and engineering, life sciences.

In addition, anybody can search and view the titles and the abstracts of these papers for free.

The full texts, however, can be accessed only from the universities that are members of the two university libraries consortiums.

(Content Division)

Director General Masao Sakauchi's greeting from the June 2 press release

Topics

Explanatory meeting on grants-in-aid for scientific research

On September 7, an explanatory meeting on grants-in-aid for scientific research was held, with Assistant Manager Hideho Yoshida of the Scientific Research Aid Division of the Ministry of Education, Culture, Sports, Science and Technology's Research Promotion Bureau serving as lecturer. Since the last fiscal year, this meeting has been held by linking the NII (including faculty and staff of the Organizational Headquarters, the Center for National University Finance and Management) with the National Institute of Polar Research and the Institute of Statistical Mathematics via a videoconferencing system. This fiscal year as well, a total of approximately 70 persons from the three venues participated in the meeting.

Following a greeting from Director General Masao Sakauchi, Mr. Yoshida described an overview of the system for grants-in-aid for scientific research as well as specific aspects of the latest trends in grants-in-aid, key points related to examination of applications, and measures to prevent fraud, among other related matters. Attendees listened intently. Following Mr. Yoshida's presentation, a lively question-and-answer session was held on matters including use of expenses and examination of applications. The meeting proved beneficial for all concerned.

(Research Cooperation Division)

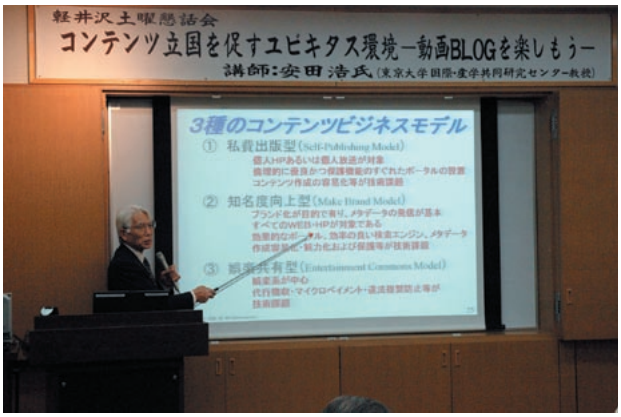
Karuizawa Saturday Salon 2006

The third, fourth and fifth lectures of the Karuizawa Saturday Salon were held respectively on July 8, July 29 and September 2, 2006, at the International Seminar House for Advanced Studies in Karuizawa, Nagano.

Third Lecture: July 8, 2006

Ubiquitous network society helping Japan to become a leading content nation — Enjoying video-blogging

Professor of Center for Collaborative Research,
The University of Tokyo
Hiroshi Yasuda



The e-Japan Strategy, started in 2001, evolved into the u-Japan Strategy (Ubiquitous Japan Strategy) in 2004, and nowadays much lively discussion focuses on the creation and distribution of digital contents and on content distribution networks (CDN). Furthermore, in February 2006, the Intellectual Property Strategy Headquarters at the prime minister's office established a strategic program aimed at achieving three objectives necessary for digital contents: user power, creator power, and business power. Thus, the government has been making concrete efforts toward Japan's achieving the status of a leading content nation.

In this lecture, I will discuss the role that the ubiquitous network society has played in the creation and distribution of digital contents. I will also discuss new business models based on this change. Introducing the importance of publishing information by using video contents, I will explain technological problems and prospects of a national program called "All Japanese are Content Creators," which is aimed at establishing an environment that would enable every person to easily create video contents and enjoy video blogging.

(Excerpt quoted in leaflets handed out at the seminar)

(Publicity and Dissemination Division)

Fourth Lecture: July 29, 2006

The world and Japan as seen by a retired diplomat

Former Japanese Ambassador to the United States
Kunihiko Saito

With the end of the cold war, the threat of World War III breaking out has disappeared. However, the world is currently not moving in the right direction towards achieving a peaceful and affluent community. Instead, the world now has more unsolved problems, such as intensified regional conflicts and terrorist activities and worsening global environmental problems.

Under these circumstances, Japan is playing a very important role. Japan has significantly contributed to the development of less developed countries through "Official Development Assistance (ODA)", investments, and technology transfers. Contributions to peacekeeping activities have also been gradually growing in recent years.

Japan's relationships with its neighbors are somewhat strained at present: Japan maintains amicable relations

with the United States, in spite of a number of problems such as the realignment of U.S. forces in Japan and BSE (bovine spongiform encephalopathy); Japan-Russia relations have stagnated; North Korea is the greatest immediate threat to Japan; the relationship with China is the most important medium- and long-term issue facing Japan's diplomacy.

In this lecture, I will explain these relationships in detail.

(Excerpt quoted in leaflets handed out at the seminar)

(Publicity and Dissemination Division)

Fifth Lecture: September 2, 2006

How was the transistor born and how was it developed in Japan? — Separate tales of some key persons

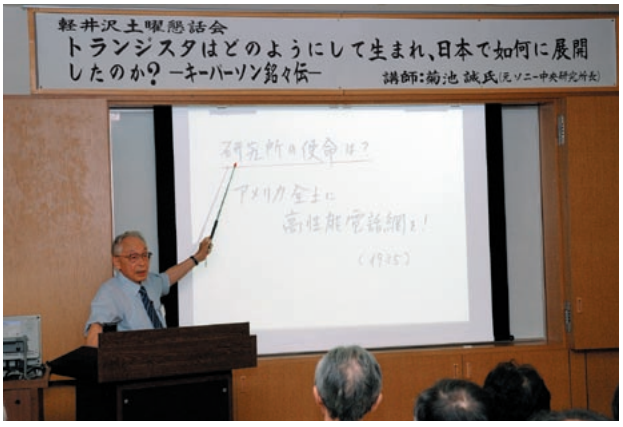
Former Director of Sony Corporation Research Center

Makoto Kikuchi

The greatest event in the 20th century was the invention of the transistor. Since its birth, the transistor has revolutionized the lives of people around the world.

Then what were the circumstances in which the transistor was created? And how was it introduced and developed in Japan, where people had a very low standard of living after defeat in World War II? Japan surpassed the United States in transistor technology over time. How was Japan able to realize such an achievement?

Having graduated from university in the year the transistor was publicly announced, and having had the good fortune of being engaged in its research at the national institute, I have maintained a thirty-year friendship with William Bradford Shockley (1910-1989) and John Bardeen (1908-1991), and experienced historic events on the transistor scene. In this lecture, I will introduce various episodes and their developments from my experience.



Many leading seniors and friends in the field have passed away one after another, so I will talk about some of these key persons who made transistor history. I will tell their stories in the "Ako gishi meimeiden" (separate tales for each of the avengers) style of the latter-day professional storyteller, Ichiryusai Teizan.

(Excerpt quoted in leaflets handed out at the seminar)

(Publicity and Dissemination Division)

NII Public Lectures 2006 "Eight Words to Talk Informatics"

Third Lecture: Thursday, August 24, 2006

Modern Cryptography: What are the cryptographic technologies that protect information in a network society?

Assistant Professor,
Principles of Informatics Research Division

Yodai Watanabe

March 1995 Bachelor of Science from Department of Physics, Faculty of Science, University of Tokyo
March 2000 Ph.D. in Physics from Department of Physics, Graduate School of Science, University of Tokyo
April 2000 Institute of Industrial Science, University of Tokyo/Technical Associate
April 2002 RIKEN Brain Science Institute/Special Postdoctoral Researcher
April 2004 National Institute of Informatics/Research Associate
April 2004 RIKEN Brain Science Institute/Visiting Researcher
April 2005 Ph.D. Program in Informatics, Graduate University for Advanced Studies (Sokendai) / Assistant Professor
[Research fields]
Computer Science, Statistical Science, and Nonlinear Science

With the development of open networks, such as the Internet, various services on the network, for example, electronic commerce and electronic governments, are becoming a reality.

However, in order to provide these services, it is necessary to ensure network security and avoid various injustices.

Cryptographic technologies based on secret bits of information and the functions of authentication provide a platform for this security. For instance, cryptographic technology is used for sending confidential information, such as passwords and credit card numbers, on online shopping websites.

Cryptography has a more than 2000-year history. This history is comprised of mostly a hide-and-seek game of designing and breaking cryptography.

Several professional cryptography techniques have been provided by a few professional engineers, but the invention of a public-key cryptosystem 30 years ago has

led to the recognition of cryptography as a subject for scientific study recently.

In this lecture, I explained this scientific cryptography -as it is called in modern cryptography - with specific examples, including how to design and break it.

(Publicity and Dissemination Division)

Fourth Lecture: Wednesday, September 13, 2006

Typhoon information: How will information technology change the media's means of delivering information?

Associate Professor,
Digital Content and Media Sciences Research Division

Asanobu Kitamoto

March 1992	Bachelor of Science from Electronic Engineering, Faculty of Engineering, University of Tokyo
March 1994	Master of Engineering from Electronic Engineering, Division of Engineering, University of Tokyo
March 1997	Doctor of Engineering from Electronic Engineering, Division of Engineering, University of Tokyo
April 1997	March 2000 Research Associate, Systems Division, National Center for Science Information Systems
April 2000	March 2003, Research Associate, Research Center for Testbeds and Prototyping, National Institute of Informatics
June 2001	Visiting Researcher, University of Nantes, France
April 2003	March 2003, Research Associate, Multimedia Information Research Division
April 2004-Current	Associate Professor, Infrastructure Systems Research Division
April 2005-Current	Associate Professor, Department of Informatics, The Graduate University for Advanced Studies

[Research fields]
Image Analysis, Image Database Systems, Pattern Recognition, Data Mining, Meteoinformatics, Computer Graphics

When a typhoon approaches Japan, information about the typhoon dominates the news. The methods for conveying typhoon information seem to be fairly standard.

Information usually reported includes the current position and power of the typhoon, the forecast, related news gathering efforts, and on-scene reporting. However, the development of information technology might make it possible to convey real-time typhoon information in different ways from those conventional methods.

I discussed how to organize important information involving natural disasters and how to deliver it to people. From the perspective of an informatics researcher, I also discussed how we can utilize the data from past typhoons to develop present and future measures for conveying information about natural disasters.

(Publicity and Dissemination Division)

Fifth Lecture: Wednesday, October 11, 2006

Intelligence: How do we gather information and turn it into knowledge?

Professor,
Information and Society Research Division

Hajime Kitaoka

1979	B.A. (Law), University of Tokyo, Japan
1984	M.Litt. (International Relations), Oxford University, UK
April 1979	Joined the Ministry of Foreign Affairs (MOFA)
January 1996	Counsellor (Head of Chancery), Japanese Embassy, Finland
August 1998	Director of Intelligence Coordination Division, Intelligence and Analysis Bureau, MOFA
March 2001	Senior Research Fellow, Institute for International Policy Studies
April 2003	Director for General Affairs, Satellite Intelligence Center, Cabinet Intelligence Research Office (CIRO)
April 2005	Professor, National Institute of Informatics, Tokyo, Japan
April-September 2006	Part-time Lecturer, Graduate School of Takushoku University (Concurrent)

What is intelligence? The word may conjure dangerous images such as spying and wiretapping in our country. However, it covers a broad range of meanings.

Intelligence is produced from information such as memos and picture/audio recordings which are taken from our changing reality. It is knowledge to help us make judgments and take action.

Before traveling abroad, a traveler will usually decide on a destination first, then accommodations and places to visit; he or she usually makes these decisions by collecting information, but in doing so is unconsciously producing intelligence from that information. It is the same thing for a nation that tries to plan and execute a security policy, and also for a company that tries to plan and execute a corporate strategy.

My lecture explaining the frontiers of the intelligence world was given in a teacher-pupil dialogue style.

(Publicity and Dissemination Division)

Intellectual Property Center News

Patent Cooperation Treaty (PCT) application (international application)

In most cases, when the Research Organization of Information and Systems applies for foreign patents, it uses Patent Cooperation Treaty (PCT) applications. Accordingly, this article provides an overview of the PCT application and a brief introduction.

There are two methods of preserving rights by applying for foreign patents. The first is application under the Paris Convention, while the second is the PCT application. In either case, if application is filed within one year of the Japanese patent application date, the date of the Japanese application is established as the priority date.

After the PCT application is filed, the Patent Office searches whether earlier applications have been filed almost the same patents and reports on the results of this search to the applicant. The applicant checks this report in deciding whether claims contained to the application have novelty, inventive step and so on. Considering technological trends and market trends, the applicant decides the designated countries.

Assistance expenses for application can be supported by applying to the Japan Science and technology Agency (JST).

Meanwhile, it should be noted when applying for a foreign patent that in some countries (primarily in Europe), if a paper related to the application has been presented prior to application for a patent in Japan, the patent application will not get the right of patent.

For this reason, inventors should complete the patent application process before announcing any related papers.

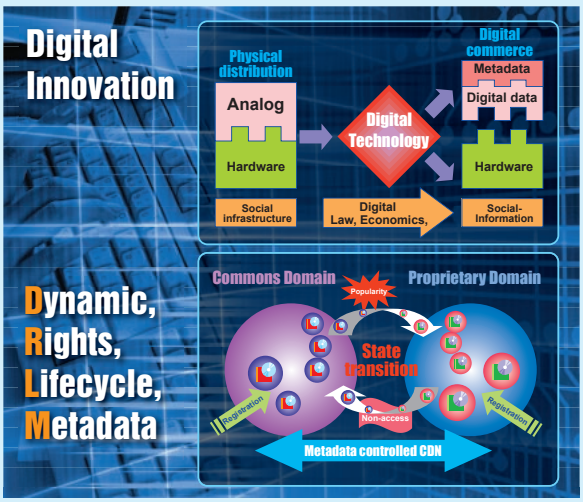
In addition, the corporation of the inventors is necessary to make response to the Patent Office after the PCT application filed, since this process has considerable influence on whether a patent is granted.

(Intellectual Property Center)

Description of the cover

Digital rights lifecycle metadata management system

Issues related to sharing and exclusivity and to ownership and use in connection with intellectual property rights such as copyright and patents in the digital world are rooted in the difference between the worldviews of the connected analog world and the dispersed digital world. This project is intended to develop system designs, technologies, and distribution models suited to the digital age. It proposes a digital rights lifecycle metadata management (DRLM) system linking digital rights expression (DRE)—which provides incentives for information exchange by increasing the ratings of commercial content automatically if it is evaluated highly in the public domain—and digital rights management (DRM).



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

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

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