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SUPER SINET Research No. 2

Nanotechnology research using supercomputers

Professor, Institute for Materials Research, Tohoku University;
Director of the Center for Computational Materials Science, Tohoku University,

Yoshiyuki Kawazoe

Yoshiyuki Kawazoe completed his graduate course at the Graduate School of Science, Tohoku University in 1975, earning a PhD in science. He was Research Associate in the Department of Physics, Tohoku University from 1975 to 1981; was Associate Professor at the Education Center for Information Processing, Tohoku University from 1981 to 1990; and has been Professor of the Institute for Materials Research, Tohoku University, and Director of the Center for Computational Materials Science, Tohoku University since 1990. He specializes in material design based on first-principles calculations using special-purpose supercomputers and material database construction.

Four of the five Super SINET projects started in 2001; the last one, VPN (Virtual Private Network) for the nanotechnology group, started in October of last year. It is the first cooperative computing project using supercomputers belonging to different organizations geographically isolated from each other, and we are currently testing connections and identifying problems.

Nanotechnology became a focus of attention three years ago after Bill Clinton, then president of the U.S., announced the National Nanotechnology Initiative. The objectives of the initiative include the development of new devices of such a scale that it is possible to place the entire contents of a library on a microchip, and its basis is the creation of new materials with new combinations of atoms and molecules. In other words, it is a drastic change from the traditional approach using "techniques to make a big thing small." Here, quantum effects dominate phenomena, and all of the predictions based on first-principle calculations are expected to be realized non-empirically.

Our research group has predicted various types of new nanoscale materials and, in collaboration with experimentalists, has confirmed their existence. Recently, the silicon fullerene, which is a silicon cluster made up of 10 to 20 silicon atoms enclosing a metal atom as shown in Figure 1, has received a great deal of attention. Due to its beautiful symmetry and unique characteristics not found in bulk silicon, there are high expectations for it as a potential component of the new devices. It has attracted considerable attention in connection with sentinel lymph-node biopsy, which accurately measures the position of cancer.

As the density of integrated circuits increases, the circuit elements such as transistors become less dominant in the circuit, and the wiring that connects these elements occupies the majority of the substrate. For this reason, atomic wiring has received a great deal of attention. Figure 2 shows a nanoscale wire made of a conductive polymer coated with insulating tubular molecules. It is a remarkable technology that can enable the realization of a line width of 1/100 or an area 1/10000 of the submicron scale, which is the smallest possible size with the current silicon technology.

Figure 1

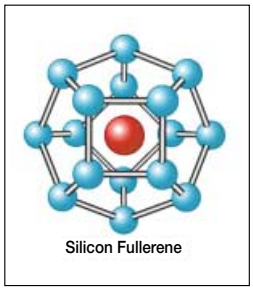


Figure 2

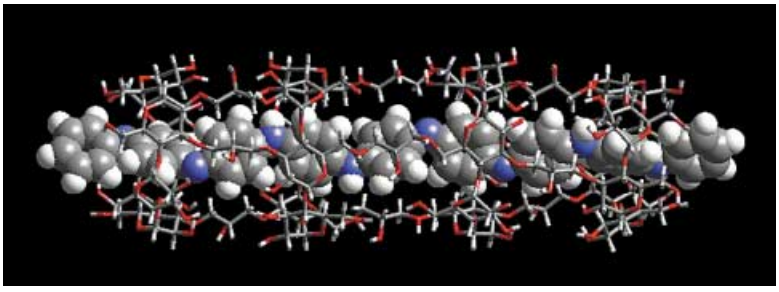


Figure 1 : A silicon fullerene. After its prediction, based on first-principles calculations in 2001, the research group of Director-General Kaya at the Institute for Molecular Science experimentally confirmed its existence within about a year.

Figure 2 : A nanoscale wire made of a conducting polymer covered with insulating tubular cyclodextrin molecules. We compared our first-principles simulation results with the experimental results obtained by Professor Kozo Ito of the University of Tokyo.

These first-principles simulations far exceed the level of traditional band calculations, and the ambitious goal of these first-principles simulations is to determine the structure and predict the physical properties of systems containing several hundred atoms. In order to materialize these simulations, it is essential to construct a virtual super-supercomputer connecting supercomputers with a gigabit-class ultra-high-speed network, and to implement real-time, on-hand visualization of the intermediate results on computers at distant locations. Here, Super SINET plays an extremely significant role.

I would like to express our sincere gratitude to the National Institute of Informatics for their invaluable assistance in conducting our nanotechnology studies.

SUPER SINET Research No. 3

Astronomy and space science with an ultra-high-speed network

Professor / Director, Radio Astronomy Division,
National Astronomical Observatory of Japan

Yoshihiro Chikada

Yoshihiro Chikada was born in 1946. He completed his graduate studies at the Graduate School of Science, University of Tokyo in 1976, and received a Ph.D. in science in 1978. He was named Research Associate at the Tokyo Astronomical Observatory, University of Tokyo in 1979. After serving as Associate Professor at the National Astronomical Observatory, he has been Professor there since 1992. His research fields include ultra-high-speed signal processors for astronomy, special-purpose computers, and lens antennas that can overcome the light-gathering power limit.

How do we use super SINET in the field of astronomy and space science? One unique use for it is in the Very Long Baseline Interferometer (VLBI). Super SINET is being used here as part of a radio telescope.

Telescopes use mirrors and lenses to focus light or radio waves in order to measure their strength. The sensitivity of a telescope, which determines how weak a signal the telescope can detect, improves if the collection area increases. The angle resolution of a telescope, which determines how finely the telescope can resolve space, improves if the diameter of the telescope is increased. When we attempt to observe an object that is extremely far away, such as a quasar, the diameter required to obtain the necessary angle resolution would be several hundred to several tens of thousands of kilometers. It would not be possible to build a telescope of that size.

So what can we do? Abandon reflecting electromagnetic waves with mirrors through the air to focus them, and replace the mirror-focus pathways through the air with cables. Then, every part of the mirror is free from every other part and becomes an independent antenna (element). By connecting the parts using cables, we can, in principle, realize a telescope with a large (virtual) diameter of any size, and can obtain high-angle resolution (Figure 1).

Then, the problem again becomes the sensitivity. The bandwidth that a cable can transmit is finite. If it is narrow, the information collected using the mirror, and thus the sensitivity, will be lost. Other components of the radio telescope that can limit the bandwidth are the low-noise receiver at the focus, and the analog/digital (AD) converter that converts the signals to digital form for easier processing. The bandwidth of a low-noise receiver is several GHz, as is that of recent AD converters. We therefore also want the cable bandwidth to be several GHz and, if we are to transmit the data in digital form, we want it to be at least several tens of Gbps.

If the transmission distance is short, the transmission cost is insignificant. However, with the VLBI, which extends to several hundred to tens of thousands of kilometers, the cost is extremely high, and a bandwidth of tens of Gbps was an impossible dream. In the past, we gave up on the idea of direct connection using cables. We recorded the signals using high-speed tape recorders at the antenna sites, sent the tapes to a signal processor known as a “correlation device” at the center, and replayed the tapes to combine the signals. This process confined the bandwidth to a maximum of 1 Gbps. In

other words, it was the transmission bandwidth that limited the sensitivity of the VLBI.

With a high-speed network such as Super SINET, the bandwidth can be increased by one order of magnitude. The expensive antennas required by such a network, each of which cost several hundred million to several billion yen, now function as a telescope with a doubled diameter. Further, as a result of this improvement in sensitivity, we can now see objects that could not previously be seen, such as stars. The visible light from stars can even be seen with the naked eye. However, using radio waves, we have not previously been able to observe any stars other than the sun, the nearest star to us. The sun observed using radio waves reveals various exploding phenomena. But what about other stars? There are many other things that we could not observe due to the sensitivity limitations of the VLBI.

Figure 2 shows the results (interference patterns) obtained by the first VLBI with fiber-optic links connecting the antenna of the Geographical Survey Institute in Tsukuba, the antenna of the Institute of Space and Aeronautical Science in Usuda, and the National Astronomical Observatory using Super SINET and the GALAXY project (joint research project by NTT Co., Ltd., Communications Research Laboratory and the National Astronomical Observatory).

An international project known as “SKA (Square Kilometer Array)” with a collection area of one square kilometer and a (virtual) diameter of several thousand kilometers is also being launched, and is scheduled for completion in 15 to 20 years. The U.K. and U.S. are also preparing VLBIs with fiber-optic links. We hope to take the initiative by making full use of Super SINET.

In the field of astronomy and space science, other projects are also underway, such as the virtual astronomical observatory project with a network-connected database and the celestial-body simulation project with a network of computers of different architectures, including GRAPE computers (special-purpose computers for solving gravitational many-body problems), PACS at the University of Tsukuba, and conventional supercomputers.

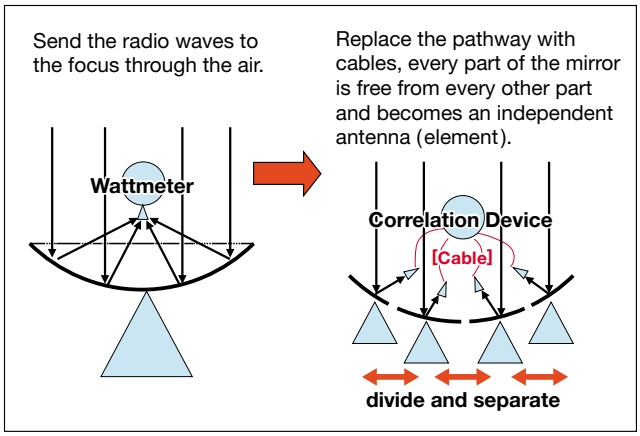


Figure 1: Instead of sending the radio waves to the focus through the air, if we replace the pathway with cables, every part of the mirror will be free from every other part and will become an independent antenna (element), and in principle a telescope with a (virtual) diameter of any size can be realized.

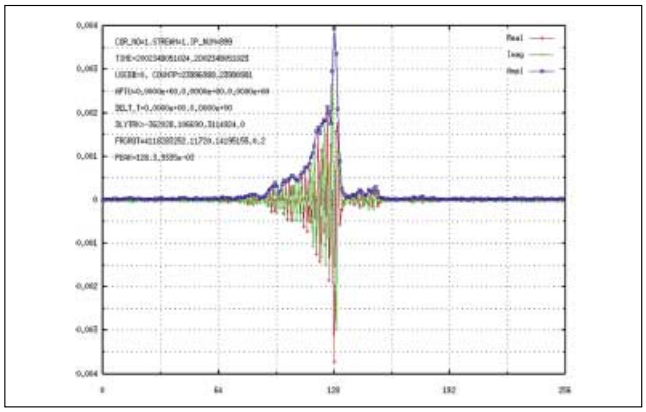


Figure 2: The observation results (interference patterns) obtained by the first VLBI with fiber-optic links connecting the antenna of the Geographical Survey Institute in Tsukuba, the antenna of the Institute of Space and Aeronautical Science in Usuda, and the National Astronomical Observatory. The celestial body is 3C84. It was measured on December 14, 2002.

Opening ceremony of the Center for Grid Research and Development (NAREGI), followed by a commemorative lecture

On July 1, the opening ceremony of the Center for Grid Research and Development (NAREGI) was held at Gakushi Kaikan, accompanied by a commemorative lecture, a private tour of the NAREGI facility, and a celebration.

The National Research Grid Initiative (NAREGI), a five-year project in which the National Institute of Informatics (NII) is expected to play a central role, officially started in April 2003. The purpose of this project is to strengthen Japan’s competitiveness in the

Speech by Director General Suematsu at the NAREGI opening ceremony

Speech by Mr. Ishikawa, Chief of the Research Promotion Bureau, Ministry of Education, Culture, Sports, Science and Technology, at the NAREGI opening ceremony

Speech by Mr. Fujisaki, Chief Technology Officer and Director of Fujitsu Limited, at the opening ceremony of NAREGI

Commemorative Lecture by Dr. William E. Johnston

information and communications fields by developing a next-generation computing environment for researchers. The ceremony was held to celebrate the opening of the Center for Grid Research and Development (NAREGI) on the 14th floor of the Mitsui Building in Jinbo-cho, near the National Institute of Informatics, to serve as the site for research and development of the grid middle ware.

The opening ceremony at Gakushi Kaikan was attended by approximately 140 people from the Ministry of Education, Culture, Sports, Science, and Technology, the Ministry of Economy, Trade and Industry, the Cabinet Office, corporations, research institutes, and parties participating in the project.

At the ceremony, following the speech by Dr. Suematsu, Director General of NII, Mr. Ishikawa, Chief of the Research Promotion Bureau, Ministry of Education, Culture, Sports, Science, and Technology, and Mr. Fujisaki, Chief Technology Officer and Director of Fujitsu Limited, offered words of congratulations in which they expressed their high expectations for "National Research Grid Initiative." After the speeches, Dr. Miura, Project Leader of the NAREGI project and Visiting Professor at NII, made a presentation on the objectives of the project, the research and development plan, the system, and the research themes.

Following a break, Dr. William E. Johnston, Chief Architect of NASA's Information Power Grid Project and world-recognized researcher in grid computing technology, was invited to give a commemorative lecture on the current situation of grid computing in the fields of science and technology, under the title of "Computing and Data Grids for Science and Engineering."

Many members of the press attended the opening ceremony and the commemorative lecture, showing their great interest in and expectations for the project.

Then, following a private tour of the Center for Grid Research

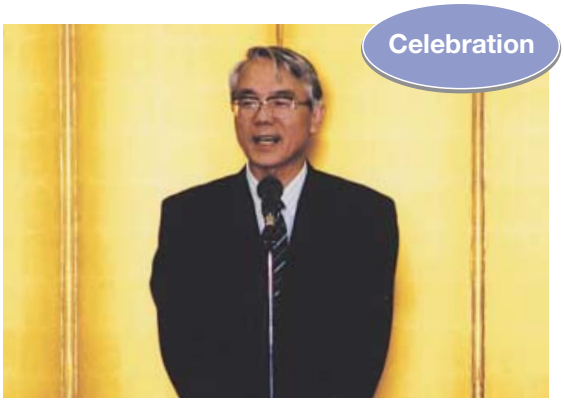
Private tour of NAREGI R&D site (from left, Deputy Director General Sakauchi, Mr. Akeno, Director of the Science Information Division, Research Promotion Bureau, Ministry of Education, Culture, Sports, Science, and Technology, Dr. Miura, Project Leader of NAREGI, and Director General Suematsu)

and Development (NAREGI), a celebration was held by participants.

The details of this project are available at the following website:
http://www.naregi.org/

(Planning and Coordination division)

The design of the logo for this project is based on the original graphics by Prof. Slavik V. Jablan of the Mathematical Institute of the Serbian Academy of Sciences and Arts in Yugoslavia. The author's permission for its use has been obtained.



Speech by Dr. Nakamura, President of the Corporate R&D Group, Hitachi Limited, at the NAREGI celebration

Research introduction

Development of the next-generation operating system, SSS-PC

We are developing a next-generation operating system (OS), SSS-PC, which can support from a single machine to a large-scale computer cluster consisting of 100,000 computers. SSS-PC combines inexpensive PCs and server machines as shown in Figure 1, and makes it possible to use them as a single high-performance parallel computer with high reliability. Its development started in 1994 with the aid of the Information-Technology Promotion Agency and Precursory Research for Embryonic Science and Technology conducted by the Japan Science and Technology Corporation.

The development of SSS-PC (Three-S PC) followed that of SSS-CORE (Three-S Core), which was a performance-oriented OS for computer clusters. SSS-PC is aimed at extending SSS-CORE with highly available and highly reliable capabilities. Figure 2 shows the basic architecture of SSS-PC. SSS-MC, the core part of SSS-PC, runs on the hardware of each computer, and cooperate with each other by utilizing a low-cost communication/synchronization mechanism called Memory-Based Communication Facilities (MBCF) and the Information Disclosure Mechanism (IDM). The construct realizes efficient simultaneous execution of parallel user applications spanning to multiple machines. As SSS-PC can multi-task user applications designed for parallel processing, users can use the system simultaneously. Further, SSS-PC supports efficient data sharing and data communications by establishing a user-level shared memory between the machines and providing an optimizing compiler for shared-memory programs. SSS-PC offers compatible libraries and enables users to make full use of their software assets for Linux and UNIX.

The most prominent feature of SSS-PC is that it adopts the original communication protocol MBCF for communications and synchronization within the cluster which can significantly reduce the overhead costs for parallel execution. Figure 3 shows the one-way latency between application programs run on a system consisting of Sun Ultra 60 workstations and Gigabit Ethernet. The total latency for sending 4 bytes of data using the MBCF is about 1/10 of that with standard TCP/IP, out of which, the software overhead cost which is

Figure 1 : A PC/WS cluster system

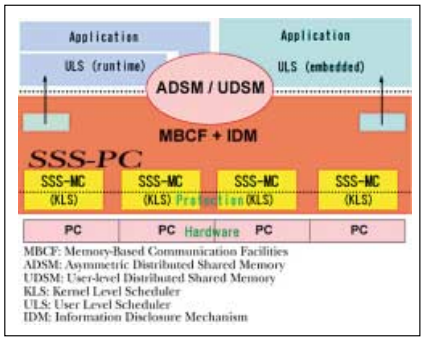


Figure 2 : The architecture and the functional construct of SSS-PC

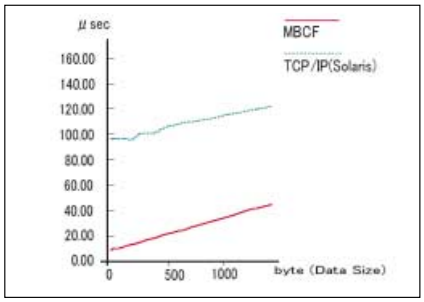


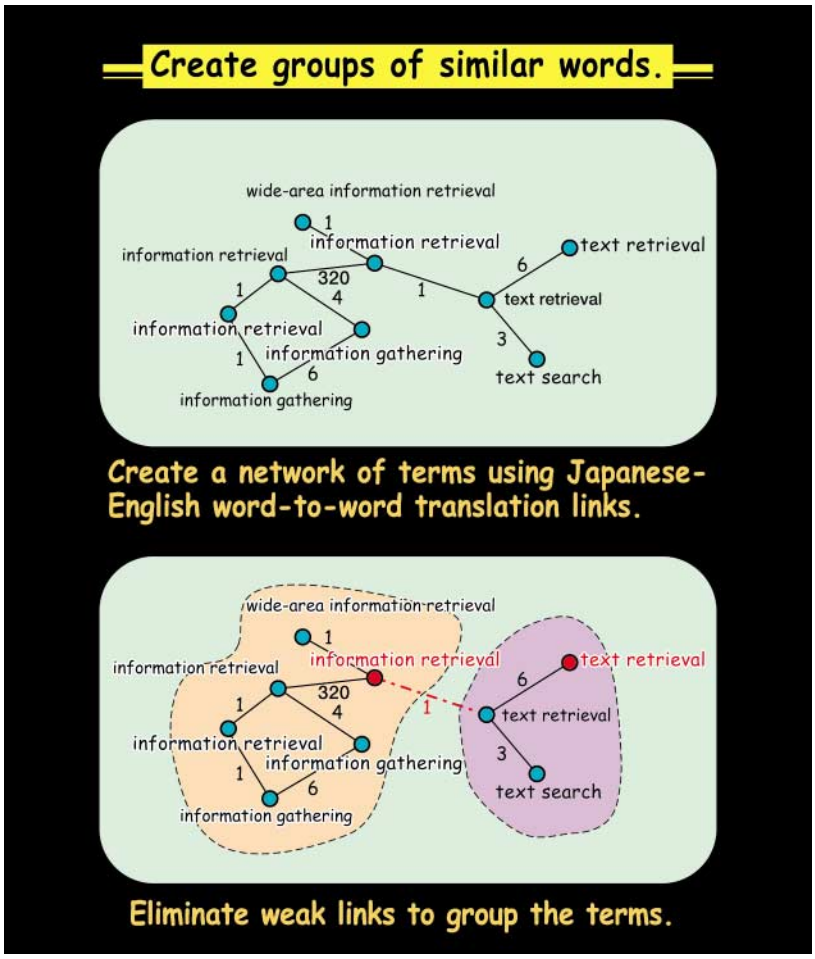
Figure 3 : The latency with MBCF

the subtraction of the hardware latency is about 1/30. Due to the small overhead, SSS-PC can execute parallel applications at high speed, and it is also extremely advantageous for transmitting a large amount of data that could saturate all channels of the high-speed communication lines.

Another outstanding feature of SSS-PC is its dynamic migration capability of application programs. The load of the system is controlled by an autonomous load distribution method, a scheduling method that I developed on the basis of the principles of the free market. Figure 4 is a series of photographs that show the load distribution among the machines. The first column in the bottom left quarter of the monitor screen indicates the application in the upper right, and the second column indicates the application in the upper left. The green, blue, pink, and red circles indicate one, two, three, and four, or more tasks, respectively. The rows indicate the four machines. The first photograph shows that the load on the fourth machine is too large. Because the load distribution is not even, migration occurs and the load is automatically balanced as shown in the second photograph. When the application is stopped at the upper right, the system shifts to a balanced state with two tasks on each machine (third photograph). After the stop instruction is given to the second machine, its tasks move to other machines and the application does not stop (fourth photograph). This allows you to maintain or increase the number of

Knowledge extraction and its application using a graph-based approach — Attempt at the automatic construction of a thesaurus from pairs of Japanese-English author keywords —

A thesaurus is a collection of words having similar meanings, and is a valuable language resource that enables the exchange of information across different communities or languages. For example, the term "television conference" is now a widely accepted IT keyword. There are many other ways of expressing "television conference," such as "communication conference," "electronic meeting," "TV conference," "remote conference," "video conference," "image conference," "teleconference," and so on. In Japanese, it would include such words as terebi-kaigi, terekonfarensu, bideo-kaigi, denshi-kaigi, and enkaku-kaigi. All of these words are similar, but it is difficult for a user at the terminal to list them all from memory.



In our research, we select technical cutting-edge keywords such as "television conference" that are not in common dictionaries, to pursue methods for the automatic construction of a thesaurus. To be specific, we focus on the relationships between Japanese-English word-to-word translations of author keywords in academic references, assume that terms with a common translation are alike, and create groups of similar words. However, because actual data may contain mistranslations, and because there are polysemous words with two or more meanings, the

machines without shutting down the applications.

We are planning to add high reliability feature to the highly available capabilities, to make SSS-PC into a scalable, dependable and purely-made-in-japan OS.

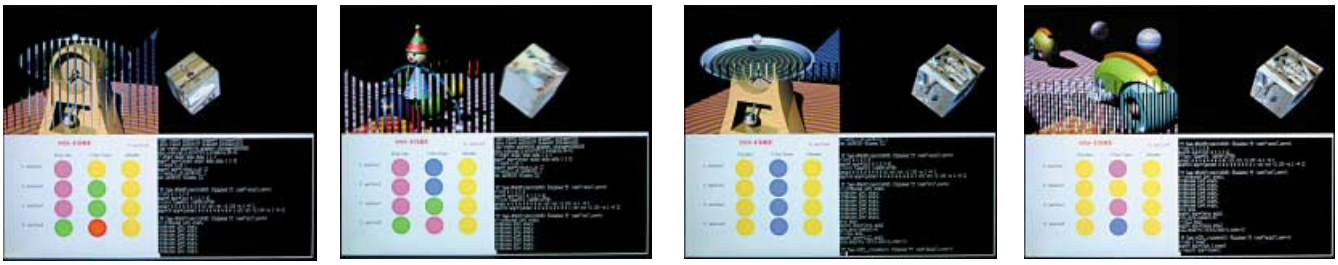


Figure 4 : An example of task migration processes

*(**Takashi Matsumoto,** Associate Professor, Computer Architecture, Infrastructure Systems Research Division)*

Research introduction

above assumption that “common translation = common meaning” is not always true. We therefore combine a simple statistical treatment and a graph algorithm known as a “minimum edge cut detection algorithm” to eliminate problematic translation relationships and make the dictionary better-organized.

The construction of a thesaurus concerns many research problems related to natural language processing. With a thesaurus constructed as described above, when the Japanese term “terebi-kaigi” is entered, for example, the system can automatically add another query term “enkaku-kaigi” or retrieve documents containing the corresponding English term “teleconference.” Such ability of cross reference is a significant research topic in exploring the new usage of a thesaurus. Japanese-English author keywords in academic references are excellent resources for constructing a dictionary. However, to increase versatility, it is necessary to develop a method for automatically obtaining high-quality Japanese-English pairs from translations of ordinary documents. Further, we need to develop methods for handling polysemous words such as “ATM,” which could mean “Asynchronous Transfer Mode” or “Automatic Teller Machine,” and methods for treating terms in view of their components, such as “television” and “conference” in “television conference.”

We have automatically constructed a thesaurus using NTCIR-1 and 2 (URL http://research.nii.ac.jp/ntcir/), which are collections of documents for the evaluation of information retrieval. An experimental online demonstration of the thesaurus (approximately 400,000 entries) is now available at the following site:
URL http://mic.ex.nii.ac.jp/dict/

*(**Akiko Aizawa,** Office for Research Coodination and Promotion, Research Center for Information Resources)*

Present status of and perspective on the future of grid computing
— Toward a national research grid

Visiting Professor, Software Reliability Research,
Software Research Division, National Institute of Informatics

Professor, Global Scientific Information and Computing Center,
Tokyo Institute of Technology

Satoshi Matsuoka

Satoshi Matsuoka graduated from the Department of Information Science, University of Tokyo in 1986; was appointed Professor at the Global Scientific Information and Computing Center, Tokyo Institute of Technology, in 2001; and was named Visiting Professor at the NII in 2002. He completed a doctorate in science (Tokyo University). His work includes the areas of high-performance systems, parallel processing, grid calculation, and cluster computers. He received the IPSJ Best Paper Award from the Information Processing Society of Japan in 1996, and Sakai Award for Research Excellence from the Information Processing Society of Japan in 1999. He has chaired the program committees of various conferences, including ACM OOPSLA '2002 and IEEE CCGrid 2003. He is Area Director of the Global Grid Forum.

The grid has recently attracted attention as next-generation network infrastructure. With the collaboration of industry, academia, and government, and the sponsorship of the National Institute of Informatics, the National Research Grid Infrastructure (NAREGI) project is being launched in 2003. In this presentation, (1) I will discuss the definition of the grid and the technical difficulties it involves, particularly the various problems that have arisen with its use as a high-performance distributed system across different administrations. (2) I will also describe major grid projects in Europe and the U.S., particularly the "TeraGrid project," which integrates large-scale cluster computers by connecting NSF supercomputer centers in the U.S. with a high-speed network that operates at 40 gigabits per second and a brain-science application that processes 400 terabytes of data. (3) I will then present our research on the "Commodity Grid," which primarily concerns the integration of large-scale PC clusters. I will discuss the PrestoIII cluster, one of the largest PC clusters in Japan, along with its cluster middleware, and the Titech Grid, which consists of approximately 800 processors covering the entire area of the Tokyo Institute of Technology. (4) Finally, I will comment on NAREGI, particularly the research and development of its middleware, and will discuss the various possibilities regarding the participation of resear-chers from within the NII.

Research and development of XML databases

Visiting Associate Professor, Large-Scale Software Research, Software Research Division, National Institute of Informatics,
Professor, Information Technology Center, Nagoya University

Masatoshi Yoshikawa

Masatoshi Yoshikawa graduated from the Department of Information Science, Kyoto University in 1980, and completed his graduate studies there in 1985. He received a Ph.D. in engineering. He served as Lecturer at the Institute of Computer Sciences, Kyoto Sangyo University in 1985; as Visiting Scientist at the Computer Science Department, University of Southern California from 1989 to 1990; and as Associate Professor at the Graduate School of Information Science, Nara Institute of Science and Technology from 1993 to 2002. From April 1996 to January 1997, he was at the Department of Computer Science, University of Waterloo as Visiting Associate Professor. Since June 2002, he has been Professor at the Information Technology Center, Nagoya University.

With the goal of developing XML database systems that can efficiently store, retrieve, and update large quantities of XML documents, researchers and engineers are conducting fundamental studies based on various approaches and developing commercial systems. The XRel system that we have been studying stores the path from the root of an XML tree to each node as the fundamental unit in relational databases. XRel converts an XPath expression into an SQL expression when processing queries. As an XML element is expressed by a region in the relation, it is necessary to execute the inequality join to distinguish the ancestor/descendant relationship between the XML elements. Researchers have recently been studying methods to avoid the inequality join by extending the XRel or to develop new algorithms for processing inequality joins. We are studying several methods of numbering the nodes in such a way as to express the structural information of the XML tree. One such method is the recursive UID, which can uniquely specify the number of the parent node regardless of the XML document size. Further, I described the international initiative, INEX, which is intended to promote the development of an XML retrieval system that uses simpler query methods instead of the formal query language, and collects XML data for evaluation.

NII Evening Forum

Lecture by Deputy Director General Sakauchi

The NII Evening Forum was established on January 17, 2003 for research exchange within NII. The purpose of this forum is to provide researchers with a place for the free exchange of ideas. Finding the common ground among a variety of research communities in NII, which is Japan's only academic research institute on informatics and covers a wide range of informatics, will enable researchers to develop new cross-sectional research themes and organize cross-sectional research groups, thereby leading to strategic projects. The first forum was held at the beginning of the year, under the theme "The First NII Evening Forum-The New Year Party 'Future Prospects for Information and Communications.'" In the four-hour forum, which started at 6:00 PM with Deputy Director General Sakauchi acting as coordinator in a friendly atmosphere, four researchers held discussions

from a variety of perspectives: “Personal view on the future prospects of research and development in the field of information” by Prof. Masao Sakauchi, Deputy Director General; “Lessons learned from my research experience and my expectations for informatics research” by Prof. Kinji Ono, Executive Director for Research; “Perspectives for the genome age over the next ten years” by Prof. Asao Fujiyama, Director of Foundations of Informatics Research Division; “Ubiquitous computing viewed from the perspective of a network” by Prof. Shigeki Yamada, Director of Research Center for Testbeds and Prototyping. This forum is expected to serve as a place for researchers to hold in-depth discussions on various themes derived from these talks.

*(**Hiroko Satoh,** Associate Professor, Computational Intelligence, Intelligent Systems Research Division)*

Special Lecture

Inventory of caravanserais and caravan routes in Central Asia — A digital and global approach

Professor, Ecole d’architecture de Paris-Val-de Seine

Pierre Lebigre

Pierre Lebigre graduated from the Department of Architecture, Ecole Nationale Superieure des Beaux-Arts in Paris.
He investigated the caravanserai in Iran in 1970 for UNESCO, and tacked the global research on "The caravanserai as a system of shapes" from 1986 in 1992. Under the framework of the Silk Road program of UNESCO, he has been nominated as the coordinator on “The analytic and systematic inventory process of the caravanserai in Central Asia” since 1998.

Prof. Pierre Lebigre presented the analytic and systematic inventory process of caravanserais in Central Asia that UNESCO which has been initiated at the end of the International Colloquium of Yazd (Iran) in 1998. It includes components such as a general cartography of caravanserais (main component of the Inventory). Caravanserais (with their associated objects: bridges, cisterns, wells etc.) can indeed be considered as spatiotemporal markers on the ancient caravan routes and so should ensure the precise reconstruction of the latter. The Geographical Information System (GIS) entirely devoted to this subject, at the moment in progress in Central Asia and developed by Pierre Lebigre and Evangelis Thomopoulos, paves the way for the draw of a caravanserais and caravan routes “master map” on all the territories which were the supports of this global phenomenon. The talk described the master map creation process which has been consisting in gathering and digitalizing cartographic, iconographic, archaeological, architectural and historical (ancient or recent) data on caravanserais and caravan routes, in identifying and locating geographically caravanserais and the different itineraries currently proposed, in transferring these data upon digital maps (topographic, hydrographical, climatic…) comprising a geographical common reference, in annotating these maps with the data coming from the Inventory of Caravanserais (texts, photographs, plans etc.) and in integrating and comparing these data.

The integrating/comparing process ensures to highlight discrepancies of or between documents, geographical or historical continuities or breaks, to bring out caravan routes scenarios which can be, then, illustrated by layouts considered as options, to implement, in a relevant way, a general typology of all the caravanserais which so can be considered, upon all the territories, as a global system of shapes, and to pave the way for questionings which are, in their turn, presented to scholars or multidisciplinary teams. This inventory related to Caravanserais is part of the cooperation between UNESCO and NII as one research sub-task under the Digital Silk Roads Initiative Framework Professor Pierre Lebigre has been granted by the leadership budget for this key cooperation visit and research works in the culture heritage domain.

Symposium "Interaction 2003"

On February 27 and 28, "Interaction 2003" was held on the second floor of the National Center of Sciences. "Interaction," which is hosted by Special Interest Group on Human Interface and Special Interest Group on Groupware and Network Services of the Information Processing Society of Japan, has achieved a favorable reputation since its launch in 1997. This symposium is the greatest event in the field, co-sponsored by many related academic organizations (which this year include the Human Communication Group of the Institute of Electronics, Information and Communication Engineers, Special Interest Group on Cyberspace and Virtual City of the Virtual Reality Society of Japan, the Japanese Cognitive Science Society, Workshop on Interactive Systems and Software of the Japan Society for Software Science and Technology, the Japanese Society of Social Psychology, and the Human Interface Society). This year, it was attended by 400 people, a record high.

In the symposium, Professor Kevin Warwick of the University of Reading in England, who implanted a silicon chip in his body for experiments, was invited to deliver an exciting visual lecture on the topic of "I, Cyborg: A Bi-Directional Interface Between the Human Nervous System and the Internet."

In addition to the presentation of carefully selected research papers, demo/poster sessions known as "interactive presentations" hold a prominent place in "Interaction." A total of 85 demos entertained not only researchers directly related to the relevant research field, but other visitors as well.

*(**Tomo o Inoue,** Research Associate, Human-Machine Symbiosis, Intelligent Systems Research Division)*

R&D Seminar on "Metadata Mediated Browsing and Retrieval in Semantic Rich Image Collection"

The R&D cooperation seminar on "Metadata Mediated Browsing and Retrieval in Semantic Rich Image Collection" was held in Honolulu, Hawaii, on March 3-5, 2003 under the joined support of JSPS and NSF. This R&D cooperation seminar is part of the two years joint-cooperation between Professor William Grosky (University of Michigan) and Assoc. Professor Frederic Andres (NII). The cooperation focuses on how to improve semantic understanding of digital images and how to reduce the semantic gap between end-user wishes and digital archives feature description. The cooperation has been extended to video and multimedia document. Eight researchers from various partner universities in the US (University of

Visit to Doris Duke Foundation by the guidance of Dr. Glaney, University of Hawaii

Michigan, Wayne State University, Kettering University, University of Hawaii), and 7 researchers from Japan (NII, Cyber Lab) met during this cooperation seminar. This seminar has been extended to discuss about Digital Silk Roads cooperation involving University of Hawaii, department of Asian Studies and Anthropology. It has been also an interesting opportunity for two PhD students (Jerome Godard, Kim Pen) of Sokendai and one PhD student from Wayne State University (DV Sreenath) to attend this seminar and to share their current research experience in front of an international audience. During the seminar, a special cultural discovery technical visit of the Doris Duke Foundation for Islamic Art (Thanks to Prof. Dru Glaney) enables to increase the understanding of oriental arts, content requirements for digital archive and private museum. Post seminar meeting was held during a visit at the National Astronomical Observatory, department of Sokendai in Astronomical sciences (located in the Hawaii Big Island at Hiro).

*(**Frederic Andres,** Associate Professor, Distributed Processing, Software Research Division)*

International Workshop on Semantic Web Foundations and Application Technologies, SWFAT

This workshop, which was held at Osaka University and Nara Prefectural New Public Hall on March 11 and 12, is Japan's first international research workshop on the Semantic Web. It focused on two issues: coordinating academic theories such as ontology with business applications in the Semantic Web and increasing awareness of Semantic Web technology in the Asia-Pacific region.

Workshop at Nara Prefectural New Public Hall

The workshop consisted of invited lectures, a panel discussion, presentations of technical papers, and poster sessions. The invited speakers and panelists included Professor Jim Hendler and Professor Frank van Harmelen, who play key roles in the promotion of the Semantic Web. The workshop brought together these leading players in Japan and was a great success. In the technical-paper sessions, researchers from the United States, Europe, and Asia made presentations, contributing to the fulfillment of the purpose of the workshop.

The workshop was attended by more than 100 people from a variety of fields, ranging from universities to corporations, which shows that the awareness of this field has increased. In particular, in the panel discussion, panelists from the United States and Europe heatedly discussed the future direction of the Semantic Web, based on the current activities and the concepts behind them.

*(**Hideaki Takeda,** Professor, Office for Cooperative Research Programs, Research Center for Testbeds and Prototyping)*
*(**Nigel Henry Collier,** Associate Professor, Symbolic Reasoning, Foundations of Informatics Research Division)*

LoRwi 2003 The second International Symposium on the Logic of Real World Interactions

The second International Symposium on the Logic of Real World Interactions (LoRwi 2003) was held on March 17 and 18, 2003 at the 12F conference room of National Center of Sciences. The symposium was sponsored by Japan Advanced Institute of Science and Technology, and cosponsored by National Institute of Informatics and Cyber Assist Research Center of National Institute of Advanced Industrial Science and Technology.

In recent years, the researchers interested in this field recognize that the semantic aspect of human to human, or human to environment interactions, i.e., the aspect how the information is generated, modified, represented, and propagated in the interaction process, should be analyzed in more depth from the view point of semantics, informatics, and cognitive science.

The symposium was organized to give opportunity for

free discussions for logicians, computer scientists, and cognitive scientists in a broad sense, having shared understanding as above mentioned. Seven invited speaker gave one or one and half hour solid talks and held active discussions with participants. (Participants total : 35, USA : 3, Spain : 1, Rumania : 1, UK : 1)
The symposium of the next year is scheduled to be held. The details will be announced on the Web page :
(URL http://www.jaist.ac.jp/~ashimoji/LoRwi2004/)

*(**Yasushi Hibino ,** Professor, Computation Theory, Foundation of Informatics, Research Division)*

Workshop on "Annotation and Resource Discovery of Geographic Image Data"

The workshop on "Annotation and Resource Discovery of Geographic Image Data" was held at Nikko Shi Koryu Sokushin Center (Nikko, Japan) on March 21th-25th 2003 under the joined support of JSPS and NSF. This organisation of this workshop is part of the on-going cooperation between the State University of New York (SUNY Buffalo) and NII. The workshop discussion focused on how to improve semantic understanding of digital geographic images data. Six researchers from several universities in the US (SUNY Baffalo, University of Michigan, Wayne State University, University of California), and 7 researchers from Japan (NII, Cyber Lab) attended this Workshop. It has been also a great opportunity for two PhD students (Jerome Godard, Kim Pen) of Sokendai and two PhD student from University of California (Shawn Newsam, Rajandra Bose) to attend this workshop and to share their current research experience in front of an international audience. During the workshop, cultural heritage has was emphasized (including a technical visit of the UNESCO world heritage site at Nikko) and was also part of the discussion for further cooperation on international cooperative testbeds.

*(**Frederic Andres,** Associate Professor, Distributed Processing, Software Research Division)*

NetCommons100 project

The National Institute of Informatics is now promoting "NetCommons100 project," which provides help with installation to nonprofit groups that hope to use NetCommons. NetCommons, which was developed by Associate Professor Noriko Arai in collaboration with NTT Data Pocket Corporation, is an information-sharing support system for community activities. The aim of the project is to disseminate the results obtained by NetCommons throughout society and to further improve NetCommons. Many organizations applied to be the first monitors of NetCommons, including universities and research institutes that are considering introducing NetCommons as an infrastructure for remote teaching and information sharing, such as the Keio University Media Center, the Research Center for Distance Learning at the Japan Advanced Institute of Science and technology, the Graduate School of Pharmaceutical Sciences of Kyushu University, and the Jikei University School of Medicine. Many NPOs and academic societies also applied to be

A scene from "Briefing session on NetCommons utilization" on April 23

monitors. The diversity in the characteristics of these groups demonstrates the flexibility and adaptability of the NetCommons system. The National Institute of Informatics assembled a selection committee and, following a careful selection process, chose 49 groups (URL http://www.nii.ac.jp/hrd/HTML/NetCommons/NetCommons_monitor.html). We will distribute NetCommons in July and will start the joint research.

On Thursday, July 31, "Briefing session on NetCommons introduction" will be held at Hitotsubashi Memorial Hall (Medium-sized meeting room) in the National Center of Sciences for the groups that have already been selected as NetCommons monitors, as well as for groups that are intending to apply to be the second monitors. This seminar will explain the technical aspects of NetCommons, and will include a lecture on the legal issues that should be considered in managing a site and a lecture on security for server managers.

*(**Noriko Arai,** Associate Professor,Mathematical Informatics, Foundation of Informatics Research Division)*

NII Open Forum on Informatics

The National Institute of Informatics (NII) has been engaged in research on informatics in a wide range of fields, from information science and engineering to the natural sciences, humanities, and social sciences, in cooperation with universities, research institutes, and corporations in Japan and abroad.

The NII Monthly Seminar, which had been offered for the past three years, was replaced by the NII Open Forum on Informatics in order to promote a more open exchange of views with the public and contribute to the development of informatics. The open forum will serve as a place where the teaching staff, visiting staff, and other research staff at NII, as well as researchers in Japan and abroad, can make presentations and hold discussions with general participants.

We hope we can count on your participation.

NII Informatics Open Forum
1st < April 23, 2003 >

Service Robot Realization by Interactive Intelligence

Visiting Professor, Robotics Research Division
Intelligent Systems Research

Professor of the Dept. of Computer-Controlled Mechanical Systems,
Graduate School of Engineering, Osaka University

Yoshiaki Shirai

Received the Doctor of Engineering degree from the University of Tokyo in 1969. He joined the Electrotechnical Laboratory in 1969. From 1971 to 1972, he was a visiting researcher at the MIT AI Lab. Since 1988 he has been a Professor of the Dept. of Computer-Controlled Mechanical Systems, Graduate School of Engineering, Osaka University. Since 2002, he has been a Visiting Professor of National Institute of Informatics. His research areas are computer vision, intelligent robot and artificial intelligence.

At first, recognition of human was presented: tracking a specified person from video images containing multiple persons using optical flow, recognition of faces in a complex background, and recognition of hand shapes from video images for sign language interpretation.

Then a welfare robot that brings objects specified by a person was introduced. In such a case, the person can help the robot by giving advice. The feature of the robot, therefore, is to achieve a task by interaction. In order to realize a comfortable interaction, the system has the following functions:

1. Object models are represented to be matched to images of objects viewed from any direction.

2. In order to adapt to an illumination condition, the illumination condition is automatically obtained and object colors are modified.
3. Depending on the uncertainty of the recognition result, contents of speech interaction are modified to maintain natural interaction.
4. Speech recognition is performed first using a user defined grammar. If not successful, a speech utterance is estimated on the basis of the situation, context, and the similarity of pronunciation.

Those items were explained using examples of video and voice.

Active Contents — Content distribution by mobile agents

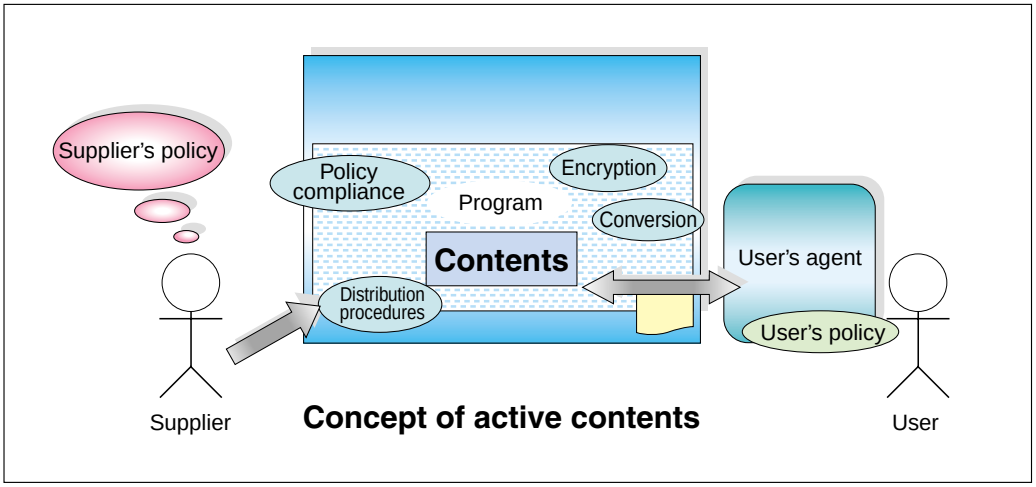
Professor, Intelligent Systems Research Division,

Professor, Graduate School of Information Science and Technology,
The University of Tokyo

Shinichi Honiden

Shinichi Honiden completed his master's studies at the Graduate School of Science and Engineering, Waseda University in 1978. He received his Ph.D. in engineering. After his career at Toshiba Corporation, he became Professor at the NII in 2000. He has also concurrently served as Professor at the Graduate School of Information Science and Technology, the University of Tokyo since 2001. He stayed at the University College of London and Imperial College in the U.K. as Visiting Researcher from May 2002 to January 2003. He is currently conducting research on agent technology, object-oriented technology, and software engineering.

Within several years, in our networked society, users will be able to send and receive contents freely, according to their specific situation, any time and anywhere, using ad hoc networks, wireless LAN, and ultra-high-speed networks. Consequently, not only on-demand multimedia services but also ad hoc content exchange will prosper as well. We can easily imagine that everyone will start sending contents from anywhere. However, the present situation does not provide adequate means for using the contents under such circumstances in accordance with the intention of the producer or supplier, or with the will, conditions, or usage of the user. Therefore, if this situation continues, the contents will overflow and disorder will result. In an attempt to solve this problem, we have proposed a mechanism in which the content itself can control its own distribution in accordance with its supplier's intentions. Specifically, the content is agentified, with the agent controlling the distribution by observing the supplier's policy. Here, the agentified contents are referred to as "active contents." Further, a mobile agent implements the active content, and the migration of the agent defines the distribution of the content. In this way, the agentification of contents will enable autonomous behavior and the free, flexible distribution of contents within the limitations of the supplier's policy



Concept of active contents

Founding the Global Liaison Office

The Global Liaison Office (Dr. Negishi, Director of the International and Research Cooperation Department) was founded in the National Institute of Informatics (NII) on January 15, 2003 with the aim of promoting research exchange in international research cooperation and international projects.

This office is expected to play an important role in the promotion of exchanges with overseas universities and research institutes through research cooperation and exchange promotion agreements with them, under the leadership of General Manger Negishi and Visiting Professor Henri Angelino, who serves as the acting director of the office.

Prior to the establishment of this office, Dr. Stephane Grumbach, the Director of the International Exchange Division of the French National Institute for Research in Computer Science and Control (INRIA) and related personnel, visited NII on January 9. After an overview of both institutes was given, we reached an agreement to actively promote research cooperation between the two institutes.

At present, this office is planning to conclude agreements and promote international exchanges with various research institutes, including INRIA.

(Research Cooperation Division)

INRIA Director Grumbach (third from right) being briefed on NII by Dr. Suematsu, Director General of NII, and Dr. Ono, Executive Director of Research

Representatives of INRIA and the French Embassy in the office of the Director General of NII

Collège Doctoral Franco-Japonais

The Collège Doctoral Franco-Japonais (CDFJ) was signed in Paris by representatives of France and Japan on September 13, 2002.

The CDFJ was founded to promote friendship and academic exchanges between the two countries. Under this program, doctoral students of the member universities of the Japanese and French University consortium are provided with an opportunity to study and receive joint research guidance for one year out of a three year doctoral course at a member university of the consortium abroad. Thus far, 27 Japanese universities and 35 French ones have signed this agreement, organizing consortiums in their countries.

The National Institute of Informatics (NII) has participated in the Japanese consortium from the beginning. After the Graduate University for Advanced Studies joins in April 2003, NII will promote student exchange as the supporting body of the university.

Japanese and French representatives signing the agreement (from left, Dr. Yuichi Yamada, President of Meiji University, Dr. Bernard de Montmorillon, President of University of Paris Ⅸ, and Dr. Seizo Miyata, President of Tokyo University of Agriculture and Technology)

Before being dispatched, students are asked to participate in a common preparatory course that will facilitate joint research guidance. They can continue receiving the guidance of their joint research advisors until the end of the doctoral course, based on mutual agreement. In addition, joint research advisors can participate in the assessment of the doctoral theses of their students, with the approval of the university to which the students belong.

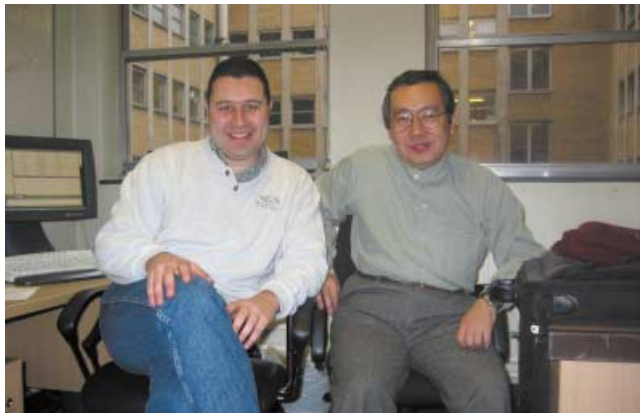
(Research Cooperation Division)

News from abroad

● ***Shinichi Honiden,*** *Professor, Knowledge Systems Research, Intelligent Systems Research Division*

I spent eight months as a visiting scholar at University College of London (UCL) and Imperial College in London in England, starting in May 2002. UCL has many of the world's leading researchers in the field of software engineering, while Imperial College is among the leaders in the fields of software engineering, parallel computing, and logic programming. In particular, the Department of Computing at Imperial College is the most prestigious in England, and is famous for its excellent students as well as its dedicated teaching staff, who take the time and trouble to provide detailed education and guidance. I was deeply impressed with the huge amount of research results produced by the more than ten postdoctoral and Ph.D. students from various countries in Europe, under the guidance of the prominent professors. As a visiting scholar, I was engaged in research on the method of establishing a safe distribution system capable of satisfying the security policy and performance requirements, in the field of security software engineering. I began this research at UCL, submitted a paper to an international journal on my research, and when I went to Imperial college, I further developed my research based on results obtained at UCL. Since returning to Japan, I have continued to conduct joint research with both universities. It is said that many Japanese who leave London after living there for a long time come to feel that they do not want to return to Japan, as the day they have to leave is approaching, or hope to return to London to spend the rest of their lives there; I felt the same way. Finally, I would like to say that I deeply appreciate being given this valuable opportunity.

The photo shows Professor Bashar Nuseibeh, my collaborator and world-famous researcher, and myself in his office at Imperial College.)

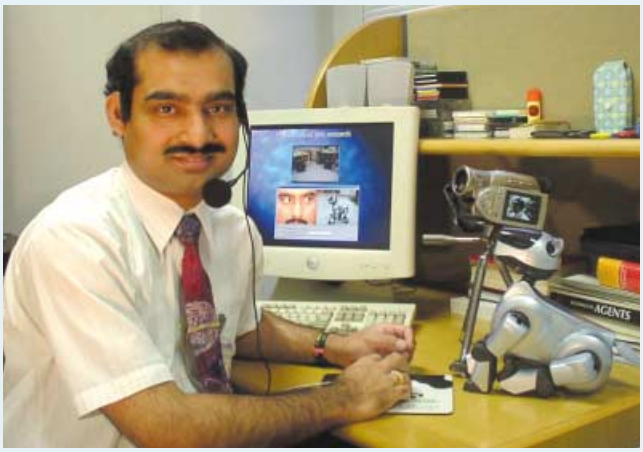


● ***Koichi Takeuchi,*** *Research Associate, Information Management Research, Human and Social Information Research Division*

I stayed in Nancy, France as a visiting researcher at LORIA(Lorraine Laboratory for Research into Information Technology and its Applications) for about 7 months from October 2003. I discussed a theoretical approach of extracting technical terms and word formation of Japanese, French and English with Prof. Romary who invited me to LORIA. During my stay in France I was surprised how close European research communities are to American communities because I saw some famous American researchers joining small research meetings in Europe. I think the relationship between Japan and Europe (or Japan and America) is different from the one between Europe and America. The cause of the differences could be geographic and cultural distance. However if I look on a positive side, the distance gives us a chance to progress unique research that is different from Europe and America.

In front of Laboratory LORIA

MESSAGE FROM FOREIGN RESEARCHER



COE Researcher, Intelligent Systems Research Division,
Human-Machine Symbiosis Research

Assistant Professor of the Department of Electronics and Computer Science, Jahangirnagar University

Md. Al-Amin Bhuiyan

Obtained his B. Sc. (Honours) and M.Sc. degrees from the Department of Applied Physics and Electronics, University of Dhaka, Bangladesh in 1987 and 1988; received the Dr. Eng. degree in Electrical Engineering from Osaka City University in 2000. His research interests include image processing, computer graphics, pattern recognition, computer vision, 3D scene reconstruction, face recognition, human-robot symbiosis.

2 years' journey at NII — Member of a Symbiotic Society

On February 13, 2001, just after my final presentation, Prof. Hiromitsu Hama of Osaka City University, my Ph.D. supervisor, informed me about an E-mail written by Prof. Haruki Ueno, the Director and Professor of Intelligent Systems Research Division, NII, regarding a post-doctoral fellowship on human-robot interface. As I had been interested to pursue more research in this field, the most exciting event in my life in Japan commenced when I was introduced to Prof. Ueno and his human-robot symbiosis research group, where I felt myself to be one of the fortunate members of the symbiotic society.

Since in a symbiotic society, all of the autonomous, distributed and intelligent components, especially robots, can share and exchange their ideas and thoughts and work cooperatively with human beings, face recognition, eye tracking and gaze direction are the important visual issues that indicate a human's intentions and interests. A real-time eye tracking and gaze direction system has, therefore, been implemented for human-robot interaction. Based on the position and movement of the eyes, the system provides instruction for controlling an entertainment robot, named AIBO using the gaze direction. The system is based on visual and geometrical information of the user's face from the video sequences and is organized with the detection of face depending on the similarity measure of the hue components of the images in the HSV color histogram.

Finally, a knowledge based information modeling has been designed and partially developed for the object detection. The range of the robot's interaction with human beings is limited by many factors, including its visual perception. As new percepts are added, new dimensions of behavior are possible to include, for example, face identification, facial expression, lip movement, head orientation, etc. Future research will be carried out to make the robots, such as AIBO, ROBOVIE, SCOUT, PINO, HOAP, and so on, capable of detecting facial gestures and expressions and interacting with human beings using natural communication in a distributed working environment.

I hope I'll be able to consolidate our human-robot symbiotic relationship with solidarity and harmony. I'll try my best to strive for the upliftment of our symbiotic society, so that we can show our research activities in NII from Jahangirnagar University and Dhaka University in Bangladesh.

During my stay in Japan, I was fascinated in Japanese culture and tried to involve myself in several cultural activities. I was cheering when I was invited to dance in a "Bon Odori" with the traditional dress like UKATA and HAPPI. I used to sing "ENKA". I enjoyed almost all of the festivals including Tenjin matsuri in Osaka and Gyon matsuri in Kyoto and Narita, during my six and a half years life in Japan. I enjoyed Japanese traditional programs like Kabuki, Bunraku and Noh. My life had really been wonderful in Japan.

From left to right: The author (Apel), Professor Hashizume (NII),
Ms. Kondo (Tokai Soft Corporation),
and Mr. Katayama (Tokai Soft Corporation),
all of whom were involved in the development of WaDokuJT.

Visiting Research Scholar,
National Institute of Informatics

Urlich Apel

Urlich Apel received a master's degree in Japanology from the Ludwig-Maximilians University of Munich in 1995. He was a Research Student at Osaka University from 1997 to 1999. He undertook his doctoral work in Dynamics of Cultures at Osaka University from 1999 to 2002. He received a Ph.D. in Japanology from the Ludwig-Maximilians University of Munich in 2002. His thesis was entitled "Japan's preparation for the 21st century — research and planning in the age of crisis." He stayed at the National Institute of Informatics as Visiting Research Scholar from January to March 2003.

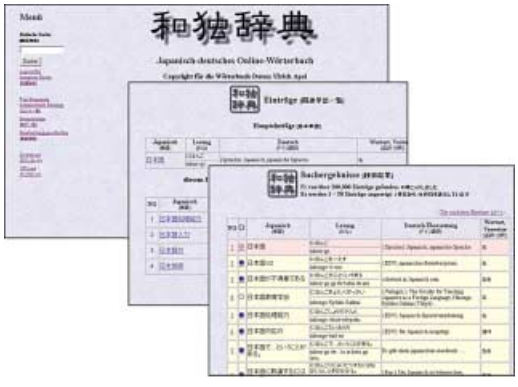
Compilation of a practical Japanese-German electronic dictionary (WaDokuJT)

When I started Japanese futurology study at the Graduate School of Osaka University starting in 1997, I was surprised that all the Japanese-German dictionaries published in Japan at the time were too much old fashioned. I could rarely find modern terms that were essential to the study of sociology. Such dictionaries are useless in conducting research. So I began to note Japanese words that got my attention into my computer, along with the German translations. This was in 1998.

Storing approximately 100 words every day, one day I found that I had a new Japanese-German dictionary with 85,000 entries. I thought that it might be useful to others as well if I added a user interface, so I reorganized the dictionary. The result is WaDokuJT. (The beta version is available at Osaka University and in Germany.) The latest commercially published Japanese-German dictionary dates back to 1980, and the latest large dictionary was issued in 1952. Because my dictionary includes new terms, Japanologists in the German-speaking countries were extremely pleased with it.

In January 2003, I had the opportunity to conduct research at the NII to make the electronic dictionary more practical. Because I wanted as many people as possible to use and enjoy the dictionary, I expanded its capabilities, with the help of a software vendor, to include a function that allows users to add their comments to the content of the dictionary. Further, I separated the system into two components – the front-end database server and the back-end editing system, thereby easing maintenance of the dictionary. Because romaji notation is an important entry method for beginners in Japanese language larning, I made a conversion routine that automatically makes romaji entries from kana entries.

For me, the three months at the NII were exceedingly fruitful, and I enjoyed the stay greatly.



Ph.D. program in informatics (Ph.D. course) of the Graduate University for Advanced Studies accepts 15 new students

The Ph.D. program in informatics (Ph.D. course) of the Graduate University for Advanced Studies accepted 15 new students in April 2003, and provided course guidance at the National Institute of Informatics (NII) on April 15.

The greeting from Dr. Suematsu, Director General of NII and head of the Ph.D. program, was followed by the self-introduction of students, the explanation of curriculum and faculty, the introduction of information services at NII, and a tour of the facilities. On April 17, the Graduate University for Advanced Studies held its entrance ceremony in Hayama.

The newly enrolled students include six students from foreign countries such as Germany, France, China, Malaysia, Bangladesh, and Iran, as well as five working students.

At present, 36 students, including 13 non-Japanese students, are enrolled.

(Research Cooperation Division)

Entrance ceremony of the Graduate University for Advanced Studies at the Graduate University for Advanced Studies

Guidance on the Ph.D. program in informatics at the National Institute of Informatics

Introduction to the Program of the Department of Informatics, School of Mathematical and Physical Science, the Graduate University for Advanced Studies

No.2 Software Science

All information systems are built upon superior software. Software is a technology indispensable to our information society. Progress toward an information society will continue in the future, and the importance of software will increase even further. The goal of the Department of Informatics at the Graduate University for Advanced Studies is to nurture superior researchers and high-level specialists. In Software Science, we are conducting research and providing education with the goal of producing superior software researchers and high-level software technologists.

Software has at its base a mathematical foundation rooted in algorithms and logic. However, the development of superior software also requires a superior perspective on handling problems, as well as comprehensive thinking that addresses diverse needs collectively and directly. The nurturing of software researchers and technologists requires not only education in the basic theories of software science but also an environment that engenders the ability to think multi-dimensionally, through discussions with faculty members and other students.

In Software Science, students learn the latest basic theories on software by attending lectures on the basic theory of software science (Programming Languages, Data Engineering), on distributed processing and multimedia processing required by today's software (Distributed Multimedia Information Systems, Distributed Software Systems, Distributed Databases, Multimedia

Information Systems), and on software theory at the nexus between user and computer (Human Interface, Computer Graphics). In addition, lectures providing overviews of the latest in software theory are available for students who are not software specialists.

In order to refine this comprehensive thinking, we have torn down the old seminar walls and endeavored to achieve a research environment that provides diverse stimuli. We have adopted a group direction system whereby three faculty members can provide a student with comments on his or her research from varied points of view. For example, a student that entered the program in this academic year is currently receiving research direction from faculty members of Software Science and Intelligent Systems Science. In this student's regularly scheduled research meetings, three faculty members meet with the student. It is a challenge for the student, but also an exceptional environment for conducting research.

The graduate students' room is shared by all students (including those from other universities conducting research at the National Institute of Informatics), allowing students to freely hold discussions with one another.

Discussions among students in the graduate students' room : All students conduct research in the same room, regardless of their directing faculty members.

In October of this academic year, the University opened its International Graduate Course, which provides a rich international environment. In fact, there are currently three students conducting research in Software Science: one is Japanese, and the other two are from France.

Students in Software Science are currently conducting research on the following topics: data mining from image data, administrative systems for geographical information, and information search using P2P systems.

*(**Atsuhiro Takasu,** Associate Professor, Data Engineering Research, Software Research Divis)*

Message from Graduate Students

Ikki Ohmukai

Ph.D. Student
The Department of Informatics,
School of Mathematical and Physical Science,
The Graduate University for Advanced Studies

I am a first-term student in the department of informatics which was established in last April. Currently I have a delightful time with many classmates and staffs. It is interesting to me that some of them come from business companies and foreign countries, and they give me various values and way of thinking.

I had studied at a private university and graduate school and couldn't make my mind up to receive advanced education. It is concerned generally when a student changes her/his major after earning a master's degree. However NII and the graduate university for advanced studies (Sokendai) have made preparations to accept "newbie" doctoral students. Prof. Ueno and Prof. Takeda also agreed to be my advisors readily so that I could join at NII.

My research theme is "Community Informatics" that covers how to support communication activities with artificial intelligence and the internet. Especially I am interested in sprouting technology called semantic web and its applications. Based on the concept, we are developing a task scheduler system for cellphones with assistance from "exploratory software project" by Information-technology Promotion Agency, Japan.

NII plays important roles of both storehouse of enormous academic harvest and frontline base for expansion of new science that is informatics. I think NII is unique institute that provides an excellent environment to realize unconventional studies.

No.3 Intelligent Systems Science

In the coming highly informative society, it is needed that everyone is able to utilize the latest information technology (IT), to use required information, and to use computers for various problem solving. The present IT is splendidly progressed compared with that of past time, and has become indispensable to everyday life or industrial activity. However, the present system is not accepted by all users and requires special training to use. In order to realize an information society, providing of suitable mechanisms for all people who can use information without any specific training is indispensable.

On the other hand, although the help by the specialist in each field is required for solving professional tasks, it is difficult for everyone to obtain such help, and then it is requested that a computer should help them instead of the professionals. In other words, it is requested that an information system becomes easier to use and smarter to help ordinary persons. The research field for realizing such a thing is the intelligent systems science, and the latest education and research on intelligent systems are done in this course.

First, about education, an intelligent systems theory (the concept and realization technology of intelligent systems), reasoning science (theoretical foundation of artificial intelligence), and human-agent interaction (human interface theory by agent technology) are the base subjects of the course.

In addition, the subjects about a knowledge sharing system (ontology, and an intelligent agents theory and technology), soft-computing (computational intelligence, such as the theory of evolution and neuro-computing), machine learning (knowledge discovery, and theory of data mining and application), image processing (image

Message from Graduate Students

Pattara KIATISEVI

Ph.D. Student
The Department of Informatics,
School of Mathematical and Physical Science,
the Graduate University for Advanced Studies

I was born on April 14, 1976 in Bangkok, the capital of Thailand. I completed my Bachelor degree in Electrical Engineering at Chulalongkorn University in 1996. Right after graduation I joined Network Technology Laboratory, NECTEC (National Electronics and Computer Technology Center), a leading government-funded research and development organization in Electronics and Computer technology in Thailand, as assistant researcher for 4 years. In 2000-2002 I pursued my Master degree in Information Technology, majored in Communications and Media technology, at the University of Stuttgart, Germany. My thesis topic was "Design of an Audio Player as System-on-a-Chip" which involved designing and implementing the Ogg Vorbis audio player on the limited embedded environment like on the PDA or mobile phone. Currently I am a Ph.D. student at NII under supervision of Prof. Dr. Haruki Ueno. My research interests now are Artificial Intelligence, Knowledge Engineering and Robotics.

I heard about the Ph.D. study at NII from a senior friend who is a researcher at NII. It was very interesting for me because of the great chance to work in this world-class National Institute with many competent researchers and professors. And although the living expense in Tokyo is notoriously expensive, with the support from Monbusho (Japanese Government) scholarship, I could then focus myself on the research work without bothering my parents or having to work in order to support myself. Another very important reason is the chance to spend a part of my life in Japan as Japan is a leading country in the world not only in the computer and electronics technology but also in economics, mechanics and other fields. Japanese history and culture are also interesting, and Japanese food is exceptionally delicious especially Tonkatsu and Gyoza. I hope during the time I am here I can accomplish my study goal and also at the same time learn Japanese culture, language and see how can you develop the country to be among the top in the world. “Doozo yoroshiku onegaishimasu.”

information processing, theory of image understanding, and application), and natural language processing (theory of natural language processing or machine translation and application) are arranged as special lecture subjects. The introduction to intelligent systems science is arranged for non-professional students by two or more teachers.
Since the role of the lectures in a doctoral course is not to give fundamental knowledge to students but to stimulate them to tackle creative scientific problems for the future through reviewing existing theory and technology and discussing issues to solve for peoples and industries, the style of classrooms is discussion oriented and therefore active joining of students are absolutely requested.

On the other hand, research in a doctoral course is done individually by supervising proffessors who guide students toward the completion of doctral thesis. This education is performed using a subject of intelligent systems science special research in a man-to-man or small group discussion style.

After entrance into a school, each student performs a research subject as a dissertation subject independently, or will participate in a research project, under the instruction by the supervisor respectively. Training as a researcher as well as an IT professional is received through this activity in addition to participate academic societies and conferences. The research themes which the present students are tackling are such as an autonomous symbiotic robot, an agent-based intellectual information retrieval, automatic construction of a concept dictionary, semantic Web computing, Web-based machine learning, etc.

In 2002, five students (including two foreign students) are learning in the field of intelligent systems as the 1st term students, and most classes as well as seminars are performed in English. We welcome such students who have dreams and wish to play an active part in an international place.

*(**Haruki Ueno,** Professor, Director of Intelligent Systems Research Division)*

Tuangthong WATTARUJEEKRIT

Ph.D. Student
The Department of Informatics,
School of Mathematical and Physical Science,
The Graduate University for Advanced Studies

I am a foreign student from Thailand. I was born in Songkhla province, the southern part of Thailand. After my high school curriculum, I went to Chiangmai province which is the most well-known town for traveling around the north of Thailand. At there, I got my Bachelor degree in Computer Engineering at Chiangmai University in 1996. Then, I started my career at Hoya Glass Disk (Thailand) Ltd. located in the Northern Region Industrial Estate. I had been working there for three and a half years as a head of Thai Computer Engineers of System Management Control division. After that, I again came back to be a student. At this time, I studied a master course at Kasetsart University located at Bangkok province, the middle part of Thailand. I received the Master degree of Computer Engineering from this university in 2002, with the thesis topic "A Closure-based Algorithm for Sequential Patterns Mining". Presently, I am a Ph.D. student at NII under supervision of Assoc. Prof. Dr. Nigel Collier. I am interested in research about how we can make a machine understand what information is inside the machine itself. This will be related to Machine Learning, Data Mining, Ontology Engineering, Information Extraction and Information Retrieval.

I heard about NII from my master course advisor who had ever been here for 2 months as a visiting professor. I was recommended that NII has very good environment to do research, many world-class professors, high level technology equipments, and abundant information accessible as well. Without hesitating, I decided to get an excellent opportunity as a Ph.D. candidate at NII. Once I have been at NII, every above mention is real. Beyond a nice institute, I also can learn Japanese culture and Japanese life style to understand how Japanese people develop their country to be the top level country in the world. I present moment would like to confirm that being a student here will bring you a wonderful life both in studying and living.

No.4 Information Environment Science

Though the term "Information Environment Science" may be unfamiliar, its meaning can be understood if it is divided into "Information Environment" and "Science," rather than into "Information" and "Environment Science." It is one of the fields of informatics that focuses on scientific research on the relationship between human beings and the information surrounding them (information environment). It is a broad concept, covering not only library informatics, but also various research fields concerning digital documents and multimedia databases, informetrics, and information law.

The following is a brief introduction to the teaching staff.

For details, please refer to the Faculty and Researcher's list on the website. (http://research.nii.ac.jp/staff-list/members-j.cgi)

Professor Akira Miyazawa has been devoted to the design and improvement of databases for books and magazines since his days at the Center for Bibliographic Information (CBI), University of Tokyo, and the National Center for Science Information Systems (NACSIS), which were predecessors of NII. He teaches the courses "Art of Information Environment Science," "Academic Information Environments," and "Information Sociology," offering guidance on catalog databases, content design in subject gateways, and system design for content production. Professor Keizo Oyama, whose research field is the study of information systems and system engineering, has been engaged in the construction of databases and software design in CBI, NACSIS, and NII. He gives lectures on "Digital Publications" and supervises research on retrieval systems for structured documents with XML, ranging

Message from Graduate Students

Kazuaki Naruse

Ph.D. Student
The Department of Informatics,
School of Mathematical and Physical Science,
The Graduate University for Advanced Studies

I'm in charge of the IC-card-system project at an electric-appliance manufacturer. Until April, I had been dispatched to the Electronic Commerce Promotion Council of Japan (ECOM) and was engaged in research on the promotion of electric commerce through cellular phones. While conducting a wide-ranging investigation on advanced technologies, social systems, and their applications, I found myself wishing to deepen my knowledge from an academic perspective and systemize it.

Around that time, I had an opportunity to attend a lecture on electronic settlement given by Dr. Okada as part of ECOM activities. When I asked him for advice on attending the Ph.D. program in informatics of the Graduate University for Advanced Studies, which I heard would be newly established, he was very helpful. Since I enrolled in the Ph.D. program, he has provided me with guidance. Though I am the oldest working student, I managed to finish my first year, studying corporate technologies and market trends in ECOM and the latest trends in academic research in the Graduate University for Advanced Studies. I would like to express my thanks for the guidance of teachers such as Professor Miyazawa and my supervisor, and for the support of my classmates. Due to the nature of my job, I have many opportunities to travel abroad on business, and I enjoy exchanging information on many countries with foreign students in the study room for graduate students.

It is no exaggeration to say that cellular phones are now an absolute necessity for life. Therefore people expect an establishment of a network information society in which everyone can live in safety. My research theme is to identify and systematize the problems involved in establishing this infrastructure. Since last year, I have been analyzing user needs through a questionnaire survey on where and for what purpose cellular phones are used, while performing a comparative sociocultural and economic analysis through a joint investigation project with universities in the Republic of Korea and Hong Kong. This year I plan to deepen my research by putting information retrieval services at NII to optimal use, and to complete my doctoral thesis.

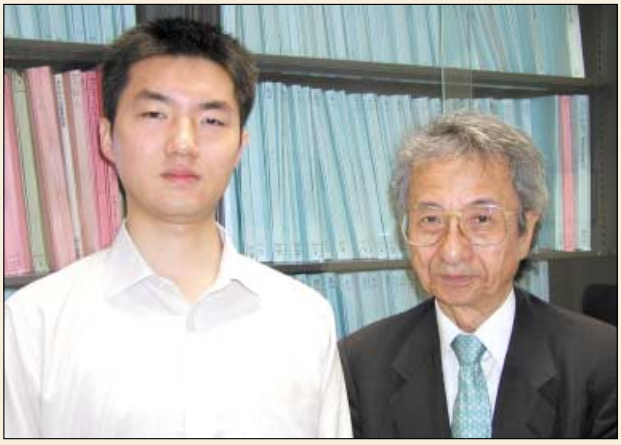
from basic technology to applied systems such as WWW, digital libraries, and electronic journals. Proffessor Noriko Kando, in the field of library and informatics, who plays an important role in the NTCIR project, teaches the courses "Information Retrieval" and "Information Sociology" and offers guidance on the concept and methods of information retrieval. Associate proffessor Kyo Kageura, in the field of terminology and information management, gives lectures on "Information and Language" and "Information Sociology" and supervises research on quantitative methods, which is required to analyze and understand various phenomena concerning language and media in our information society, as well as their interpretation. Proffessor Takeo Yamamoto, gives lecture on the "Introduction to Information Environmental Science" and "Digital Documents," offering guidance on human interfaces for reading digital documents and the long-term digital archiving of academic and cultural materials. Students can also receive guidance from Associate Professor Hitoshi Okada, whose research field is information institution research and electronic commerce research, and Professor Masamitsu Negishi, who is famous in the fields of citation analysis and informetrics.

*(**Takeo Yamamoto,***
Director and Professor of the Multimedia Research Division)

A scene from research instruction

Zhang Chao

Ph.D. Student
The Department of Informatics,
School of Mathematical and Physical Science,
the Graduate University for Advanced Studies



Mr. Zhang and his supervisor, Prof. Hatori

First of all, I appreciated that I could be the first student of the joint program hold by NII and Tsinghua University. According to the agreement, students from Tsinghua University, the number 1 school which having the prestige of both science and technology, can spend half of the time of Ph.D study at NII, the top national institute famous in informatics and network communications. For training the technical researcher, NII not only provides the perfect environment for students who can make use of the resources of consummate experimental facilities and discuss with lots of famous scholars from various majors, but also focus on develop the capability of practical research.

After my master career, I took the recommendation from Prof. Gong Ke, vice president of Tsinghua University, and joined NII as a Ph.D. student supervised by Prof. Mitsutoshi Hatori, a leading professor in wireless communication engineering. Prof Hatori gave me a systematic and comprehensive guidance. We visited some top-level research centers and laboratories, such as Yokosuka Research Park (YRP) and Communication Research Lab (CRL). We also established routine contact with professors and engineers in many famous Japanese universities and companies. Thanks to the generous financial support by NII, our research made a rapid progress. In half a year, I completed two journal papers (submitted to IEICE) and applied for a patent.

In addition, I want to emphasize that NII is not only a national institute but also an international research center. Students from all over the world come and study together. We learn how to collaborate and cooperate with people who come from different countries and have different cultures. That may be another reason why a lot of students choose NII to undertake their Ph.D studies.

Information Processing Seminar in Karuizawa

As part of information literacy training for university employees who support academic research activities, the above seminar was held at the International Seminar House for Advanced Studies (located in Karuizawa-machi, Nagano Prefecture) over four days from February 18 to 21, 2003. A total of eight university staff members participated.

This seminar is held every year under a pertinent theme, with the aim of providing participants with the latest technologies and theories on information processing to help them to respond to advanced academic information infrastructure.

The theme of this year's seminar was "D* and SPSS: Practical Data Processing in Daily Operations and Introduction to Statistical Analysis." Professor Akira Miyazawa and Associate Professor Yuan Sun of NII gave lectures and held training sessions. The curriculum centered around acquisition of the skills necessary to analyze irregular data which cannot be processed in routine work, and to produce reports without using programming language.

The Participants found D, a tool to facilitate data processing, as a perfect tool for processing catalog data in libraries, saying that they would use D and SPSS for the pre-processing and analysis of data. They also expressed their happiness at having had the opportunity to associate with lecturers and trainees until late every night, despite the heavy snow at the time.

For the report on the seminar, please refer to the website of the Dissemination Activities Division.

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

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* D is a tool for data processing that was developed by Akira Miyazawa of NII. It can be downloaded from the following Web site:

http://research.nii.ac.jp/~miyazawa/index-j.html

(Dissemination Activities Division)

In the seminar room of the International Seminar House for Advanced Studies on February 21, 2002

Group photo of lecturers and trainees

Meeting with members of SPARC (Report on the business trip to the United States)

The National Institute of Informatics (NII) plans to launch a Japanese version of SPARC (Scholarly Publishing & Academic Resources Coalition) in FY 2003, as part of the Project for the Improvement of the Infrastructure of International Scholarly Information Circulation (SPARC/JAPAN). Along with two members of the Ad-Hoc Committee on International Scholarly Communications of the Association of National University Libraries and an official of the Information Division of the Ministry of Education, Culture, Sports, Science, and Technology, we visited the head office of US SPARC in Washington, Project Euclid at Cornell University Library, and BioOne, an aggregator of bioscience electronic journals, from January 26 to February 2.

Project Euclid was started in 1999 and at present provides access to 19 academic journals in the fields of mathematics and statistics, including KODAI Mathematical Journal issued by the Tokyo Institute of Technology. On the other hand, BigOne was founded in 2001, offering access to 55 electronic journals in the field of bioscience. These projects are successfully developed with the support of SPARC, which was established under the auspices

of the Association of Research Libraries (ARL) in response to the inflated prices of the academic publications of commercial publishers.

In cooperation with university libraries, Japan Science and Technology Corporation and other organizations, NII plans to implement a project that actively supports the introduction of Japanese academic journals abroad. During our visit, we agreed to discuss our future cooperation and maintain our close relationship with US SPARC and SPARC Europe, which was established in 2002.

(Contents Division)

The Head Office of US SPARC in Washington on January 29, 2003

Participating in the CEAL Annual Meeting and the NCC Open Meeting

The CEAL (Council on East Asian Libraries) Annual Meeting was held in New York City from March 24 to 30, with the participation of researchers of the National Institute of Informatics (NII), including Mr. Akira Miyazawa, Director of the Research Information Research Division. The CEAL is a council consisting of researchers and librarians from East Asian libraries in North America. In its annual meeting, presentations on issues common to East Asian libraries in North America were given in section meetings of its committees, such as the Japanese Materials Committee and Library Technology Committee, followed by a lively exchange of opinions between the presenters and audience. Lectures on and explanations of information in Japan were given as well. This year, representatives of the Oriental Library and the Historiographical Institute of the University of Tokyo were invited to the meeting. The Oriental Library and its collection of materials were introduced in the plenary session, while the "Japan Memory Project and the Online Glossary of Japanese History" of the Historiographical Institute of the University of Tokyo were introduced in the section meeting of the Japanese Materials Committee.

NCC
Open Meeting

CEAL (Council on East Asian Libraries) Annual Meeting

In conjunction with the CEAL Annual Meeting, the NCC (North American Coordinating Council on Japan Library Resources) Open Meeting was held at the New York Public Library (NYPL) on March 28. The purpose of this meeting was to explain the activities of the NCC to the members of the CEAL and exchange opinions in order to strengthen cooperation between the NCC and CEAL. In this year's meeting, it was reported that the Global ILL Framework (GIF) between the NCC and the Association of National University Libraries is working well, and that it is possible for libraries in North America to participate in GIF. Means of making subscriptions to CD-ROMs and online journals in Japan more accessible to universities in the United of States were also discussed, in addition to the introduction of Japanese materials housed in the NYPL and the library tour.

Many of the members of CEAL and the NCC expressed their appreciation of the overseas monitor service provided by NII and their hope that the service would be continued.

(Contents Division)

Karuizawa Saturday Salon
(March 15, May 31 and June 14, 2003)

On March 15, as the eighth lecture for FY 2002, on May 31 and June 14, as the first and second lecture for FY 2003, Karuizawa Saturday Salons were held at the International Seminar House for Advanced Studies at Karuizawa. The lectures given are summarized below. The content of the first lecture will be publicly available on “el-net” and the NII Web page.

(Dissemination Activities Division)

March 15, 2003 (Eighth lecture for FY2002) :
“ The History of Codes and Contemporary Codes ”

Professor at Chuo University
Professor Emeritus
at Tokyo Institute of Technology

Shigeo Tsujii

First, Prof. Tsujii gave a fascinating speech on the history and role of codes, using as examples codes from Greek and Roman times, codes used by Sadayuki Usami, advisor to Kenshin Uesugi, in ancient and medieval times, and codes that played a historic role in the Russo-Japan War and World War II behind the scenes. Then, using many materials, he discussed contemporary codes, including those adopted for electronic money and Basic Resident Registration cards. Such codes are now expected to play the essential role of adding value to information, in addition to the role of protecting valuable information in our ubiquitous information society.

May 31, 2003 (First lecture for FY2003) :
“ In Quest of New Ethics — in a World of Chaos ”

Director, International Center
of Study of Philosophy
Professor Emeritus
at the University of Tokyo

Tomonobu Imamichi

Professor Imamichi gave a lecture that was easy for all in attendance to understand; many participants expressed their happiness at having such a good opportunity to learn so much. The content of his lecture is as follows.

“I hope to clarify the actual situation of the cha-

otic age in which we live in the three areas of society, nature, and academics in order to identify the causes and explain as simply as possible the basic measures that I believe we should take in response to them.

"The above insight is part of the results obtained by the International Eco-Ethica Society, an international joint project organized by the International Center for Philosophy that has been held yearly in Japan since 1982. (The overall results obtained by the International Society of Eco-Ethica are shown in the 20 volumes of collected papers that have already been published.)"

(Excerpt quoted from leaflets handed out at the seminar)

June 14, 2003 (Second lecture for FY2003) : "Japanese Families at a Turning Point"

Director General of the Agency for Cultural Affairs

Hayao Kawai

Flute concert

Flute : **Hayao Kawai**
Piano : **Tomoko Okada**
Violin : **Junko Ohtsu**

The participants were deeply impressed by the following lecture, delivered with a touch of humor by Director General Kawai.

"Japan now faces a crucial turning point. Since the Meiji period, it has been attempting to adopt and absorb Western civilization. As a result, it has become the only non-Christian nation that has succeeded in joining the ranks of developed countries. However, now that Western ideas have begun to be adopted in addition to Western things, we are now facing difficult issues such as how to integrate western ideas into our society.

"Families are greatly affected by this situation. There are various issues to be considered, including the extent to which we should follow Japanese traditions, the extent to which we should adopt Western ideas, and the importance of the religion behind them. In addition, we sometimes find the Western ideas that we have adopted transformed into something completely different. By providing concrete examples of these problems, I would like to discuss the future of Japanese families."

(Excerpt quoted from leaflets handed out at the seminar)

Following the lecture, a wonderful flute concert (with a program consisting of "Variation on the theme of Nanatsu no Ko," "Flute Sonata K.13 in F major," "Melody," "Carnival of Venice," and "Waltz of the Flowers") received a large round of applause from the audience.

First NII International Symposium

The National Institute of Informatics (NII) decided to periodically organize the NII International Symposium starting from FY 2002. On March 5 2003, the first symposium was held under the theme of "Digital Libraries and Electronic Journals: New Challenges" at U Tant International Conference Hall of the United Nations University, which is located in Shibuya-ku, Tokyo. The purpose of this symposium was to discuss the rapid digitalization of academic contents such as electronic journals and the challenges to be faced at university and research libraries, as well as university research and education systems in this context.

Following the keynote speech by Prof. Masamitsu Negishi, Professor and Director of the International and Research Cooperation Department of NII, lectures were given by Ms. Ann S. Okerson, Associate University Librarian of Yale University; Prof. Yoshito Ito, Professor and Director of Nagoya University Library; Dr. Raym Crow, Senior Consultant of the SPARC Consulting Group; Dr. Hiroko Sato, Associate Professor of NII; and Mr. James Testa, Director and Editor-in-Chief of the Editorial Development Division of ISI-Thomson Corporation. Following the lectures, a panel discussion was held under the theme of "Scholarly Communication Five Years from Now," chaired by Prof. Jun Adachi, Professor and Director of Research Center for Information Resources of NII. The panelists included Prof. Shun Tsuchiya, Professor of Chiba University; Dr. Raym Crow and Mr. Hitoshi Hayase, Administrative Director of Tokyo Gakugei University Library.

The symposium was attended by 180 people from across the country. Participants expressed their satisfaction with the symposium, which was organized under a timely theme and provided an opportunity to learn about recent trends, and seemed to have high expectations for the next one.

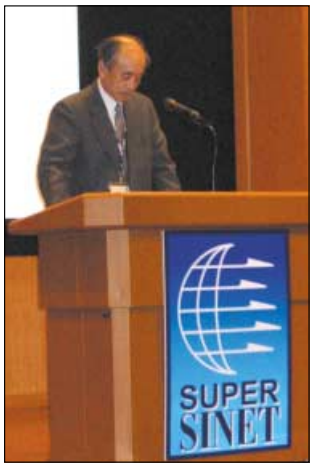
This symposium was broadcast live on the Internet with a large access.

(Publicity and Survey Division)

Second SuperSINET Symposium on "Current Situation of Research Utilizing SuperSINET"

On March 19, the second SuperSINET Symposium was held on the theme of the "Current Situation of Research Utilizing SuperSINET" at the National Center of Sciences (Hitotsubashi, Chiyoda-ku).

In this Symposium, reports on the current situation of SuperSINET and topics concerning the Genkai Project were presented.



Speech by
Director General Suematsu of NII

Lecture by Mr. Asano,
Chairman of the SuperSINET
Promotion Conference

Participants listening attentively to the reports

Reports were also given on the progress of research utilizing SuperSINET in the five cutting-edge fields of "high energy and nuclear fusion," "space and astronomical science," "genome information analysis (bioinformatics)," "supercomputer-interlocking distributed computing (GRID)," and "nanotechnology." In addition, reports on the most cutting-edge research using SuperSINET, such as the "IT-Based Laboratory (ITBL) Project," the "National Research Grid Initiative (NAREGI) Project," and the "development of technologies for control of the optical network through the use of SuperSINET" were presented.

The Symposium participants, from universities and corporations, numbered over 200, and they all listened attentively to the research reports.

(Network System Division)

Visit of the Director General of CWI in Holland

On March 25, Dr. Gerald van Oortmerssen, Director General of Centrum voor Wiskunde en Informatica (CWI), visited NII.

CWI is a Dutch research institute that primarily conducts research in basic sciences, such as computer science and applied mathematics. It also actively promotes international joint research as a member of the European Research Consortium for Informatics and Mathematics (ERCIM), which consists of 16 leading institutes in Europe in the fields of informatics and applied mathematics.

On the day, following a courtesy visit by the Director General, both institutes were profiled and research conducted in basic science by the researchers at NII was introduced. The two parties reached an agreement to actively promote exchanges between their researchers in research fields of mutual interest.

(Research Cooperation Division)

Director General, Gerald van Oormerssen (second from right)

Visit of guests from Chulalongkorn University in Thailand

On May 15, three people, including Associate Professor Wanida Hemakul, Head of the Department of Mathematics and Computer Science, Faculty of Science, Chulalongkorn University in Thailand, visited the National Institute of Informatics.

NII concluded an academic exchange agreement with Chulalongkorn University in May 2003, and agreed to strengthen cooperation between the two organizations in informatics research. This visit of researchers from Chulalongkorn University is the first exchange since the agreement was concluded.

In the front row: Researchers from Chulalongkorn University visiting the library
In the back row: Kasit Piromya, Thai Ambassador to Japan (center),
and Singtong Lapisatepun, Counselor of the embassy (third from left)

On May 15, following a profile of NII by Professor Ono, Executive Director of Research, an explanation of the activities of NII by the Content Division, and a library tour, these three guests talked with Thai researchers and students at NII. These events were also attended by Mr. Kasit Piromya, Thai Ambassador to Japan, and Mr. Singtong Lapisatepun, Counselor of the embassy.

Over three days starting on May 16, these three guests met with our researchers in specialized fields, in an effort to actively promote research exchanges.

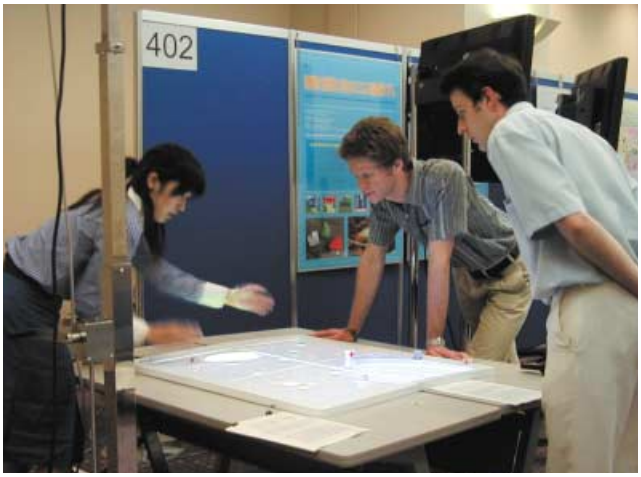
(Research Cooperation Division)

2003 NII Open House (for the general public)

The National Institute of Informatics (NII) held an Open House on May 27 to publicize its research activities and achievements. At Hitotsubashi Memorial Hall, a special lecture was given by Prof. Yoshihisa Yamamoto, who is a professor at Stanford University and is to be appointed professor at NII. This was followed by an introduction to the research activities given by 21 teaching staff in seven research areas at NII, and the overview of the Graduate University for Advanced Studies (Ph.D. Program in Informatics).

Prof. Yamamoto's special lecture on "Quantum Computation: Status and Prospects" was particularly well attended. The participants listened attentively to Prof. Yamamoto's lecture, as he is among the world's leading authorities on quantum computers. Quantum computers are next-generation computers that can perform calculations at speeds that cannot be achieved by existing computers. This lecture was broadcast live on the Internet and had many listeners both in Japan and abroad.

Special lecture by
Prof. Yoshihisa Yamamoto



Poster Exhibition (Human-computer interaction using RFID)

A group of science counselors from embassies visiting the poster exhibitions

In conjunction with the lecture, poster exhibitions of research activities were presented by relevant faculty members, while services, newsletters, and publications, as well as events held by NII, were introduced by the Development and Operations Department and the International and Research Cooperation Department. In addition, the Graduate University for Advanced Studies was introduced through demonstrations and presentations. Many visitors eagerly asked questions.

The event had over 500 attendees, who appreciated the valuable opportunity to receive a general overview of cutting-edge research. They also expressed the hope that they would have enough time to see all of the exhibitions, and that research activities would be further opened to the public. The event was reported by some media outlets and websites, showing that there is strong social interest in NII and informatics research.

On the same day, an NII information session was held, attended by 21 scientific counselors from 15 embassies. The future vision of NII, which is to become an independent agency, was explained along with the Digital Silk Road Project and research activities using SuperSINET, and a demonstration of the operation of a robot, present at NII Chiba Annex by remote control was given as an introduction to robotics research. There were also poster exhibitions at the Open House.

Materials such as the program of the open house and a summary of the presentations are publicly available at the following website:
http://www.nii.ac.jp/hrd/HTML/OpenHouse/

(Dissemination Activities Division)

Award

Director General Yasuharu Suematsu becomes the first Japanese to be awarded IEEE Education Medel

Director General Yasuharu Suematsu became the first Japanese to be awarded IEEE James H. Mulligan, Jr. Education Medal, which is one of the IEEE Major Medals. The award was given for "pioneering contribution to research and education in the field of optical-communication devices, and for outstanding leadership in graduate and undergraduate education as a mentor, professor, and president."

Director General Suematsu has been engaged in research on optical communications since the earliest days of the field. Specifically, he developed long-wavelength semiconductor lasers ,which operate at a wavelength region of 1.5 mm, along with single-mode semiconductor lasers, in order to enable high-capacity communications using the long-wavelength optical fibers that are currently in use. He stressed the importance of developing this optical-communication system and promoted cooperation between universities and pioneering companies in the field, thereby contributing greatly to the development of optical devices such as these semiconductor lasers.

Director General Suematsu (center) receiving the medal at the award ceremony held in Nashville, Tennessee on June 21

Report on the monitor services from overseas

The National Institute of Informatics provides information of research results for overseas researchers through NACSIS-IR and NACSIS-ELS. Since July 2002, we have provided the monitor program for overseas, with the aim of strengthening the global dissemination of information.

We expect the opinions and requests of overseas researchers concerning the services of NII to improve our services.

By March 2003, we had received applications from 106 organizations of 19 countries and 188 researchers of 30 countries. 93 organizations of 18 countries and 165 researchers of 29 countries actually used NII services as monitor.

We distributed a questionnaire to the monitors of fiscal year 2002 and 64 organizations and 62 researchers responded to it. We would like to take this opportunity to thank all of those who responded.

The measures and answers to the opinions and requests of the respondents are shown on the following web page:
(URL : http://www.nii.ac.jp/monitor/que/questionnaire-taiou.html)

We continue to provide the monitor program until March 2004. Researchers wishing to use the services as monitor can apply on the following web page:
(URL : http://www.nii.ac.jp/monitor/index.html)

(Publicity and Survey Division)

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

- http://www.nii.ac.jp/index.html
- http://research.nii.ac.jp/index.html
- http://www.nii.ac.jp/nii-service-e.html

NII News
National Institute of Informatics
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For Inquiry about NII News, contact to the Research Cooperation Division,
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