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June

14	Hitotsubashi Hall(2 F)	Conference Room(2F)	2nd Floor Hall(2 F)	Special Conference Room (1F)	Small conference room(2F)
10:30				10:30~12:00 Session SINET and GakuNin that support	
11:00		11:00~18:00 Demo&Experience corner/ Poster Exhibitions		cloud systems	
12:00					
13:00	13:00~13:30 Opening Open House Director General, NII KITSUREGAWA Masaru				
	13:30~14:30 Keynote Lecture "Power of Enumeration"— State-of-the-art			13:30~17:00 Session Building the future of electronic	
14:00	 Algorithms for Tackling Combinatorial Explosion Professor, Hokkaido University / Research Director, ERATO MINATO Discrete Structure Manipulation System Project, JST MINATO Shin-ichi 		Presentation	- What electronic resources can do now and should do from now	
15.00			14:40~15:00 HAYAMI Ken		
13.00			15:00~15:20 HIDAKA Soichiro		
16:00	16:00~17:00 Keynote Lecture				
	Observing Society via Television — Challenge to Social Analysis by Using Large-Scale Broadcast Video Archive Professor, NII SATOH Shin'ichi				
17:00		17:00~18:00 Intercommunication Time			
18:00					

June					
15	Hitotsubashi Hall(2 F)	Conference Room(2F)	2nd Floor Hall(2 F)	Special Conference Room (1F)	Small conference room(2F)
11:00		11:00~17:00 Demo&Experience corner/ Poster Exhibitions		11:00~12:30 Mini Lecture (11:00~11:30 Libraries as Treasure Box (211:30~12:00 Web Scarch New and A Way Equipad	11:00~12:00 Workshop Privacy Visor : To Protect Your Personal Information
12:00			Presentation	③12:00~12:30 How to Make Games That Function Properly	
10.00			12:30~12:50 OKADA Hitoshi		
13:00	13:00~14:00 Keynote Lecture Design Everything by Yourself—User interfaces for graphics, CAD modeling, and robots— Professor. The University of Tokyo				
14:00	IGARASHI Takeo		Presentation		14:00~15:00 Mini Lecture
			14:10~14:30 UTSUNOMIYA Shoko		14:00~14:30 The Mechanism of the Internet + α
15.00			14:30~14:50 GOTODA Hironobu		@14:30~15:00 A Supercomputer for Everyone
15:00	15:00~16:00 Keynote Lecture Can a robot join in an <i>Ido-bata kaigi?</i> Assistant Professor, NII BONO Mayumi				
16.00				15:40~17:40 Briefing session about entrance	
10.00				examination of SOKENDAI	16:00~16:30 Mini Lecture Security : Is Your Password Really OK?
17:00					
18:00					

Note that lecture times, topics and presenters may change without notice.

Inter-University Research Corporation / Research Organization of Information and Systems **National Institute of Informatics**



Contact e-mail oh@nii.ac.jp

URL http://www.nii.ac.jp/en/event/openhouse/



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From Fri. Sat	June 14 June 15,	

Place National Center for Sciences 2-1-2 Hitotsubashi, Chiyoda-ku, Tokyo Time Fri.14 >> 11:00~18:00 Sat.15 >> 11:00~17:00

Pre Event "Not to be missed! New Trend in IT"

Hitotsubashi Hall(2F) Thu. June 13 Artificial Intelligence

2013

Prof. Wolfgang Wahlster CEO of the German Research Center for etc

Supported by: Chiyoda-City Co-organized by: National Archives of Japan, Tokyo Association of Dealers in Old Books



sat. June 15



Hitotsubashi Hall (2F)

Fri. June **14**

00~13:30	Opening	Open House	Director General, NII	KITSUREGAWA Masaru	
30~14:30	Keynote Lecture	"Power of Algorithms Professor, Grac Hokkaido Unive Structure Manipu	Enumeration" — for Tackling Coml uate School of Informatic ersity / Research Director, lation System Project, JST	- State-of-the-art binatorial Explosion n Science and Technology, ERATO MINATO Discrete MINATO Shin-ichi	
0~17:00	Keynote Lecture	Observing Social Ana Video Arcl Professor, N	Society via Televis lysis by Using Lar nive III SATOH Shin'io	ion — Challenge to ge-Scale Broadcast chi	
onference Room(2F)					

11:00~18:00 Demo&Experience corner/Poster Exhibitions 17:00~18:00 Intercommunication Time

Special Conference Room(1F)

80~12:00	SINET and GakuNin that support development/use of academic ICT cloud systems
0~17:00	Building the future of electronic resources with university libraries – What electronic resources can do now and should do from now

Hitotsubashi Hall (2F)

00~14:00	Keynote Lecture	Design Everything by Yourself–User interfaces for graphics, CAD modeling, and robots– Professor, Department of Computer Science, Graduate School of Information Science and Technology, The University of Tokyo IGARASHI Takeo			
00~16:00	Keynote Lecture	Can a robot join in an <i>Ido-bata kaigi</i> ? Assistant Professor, NII BONO Mayumi			
onference Room(2 F)			Small co	nference room(2 F)	
00~17:00	Demo&Experience corner/Poster Exhibitions		11:00~12:00	Workshop Privacy Visor : To Protect	

pecial C	Conference Room(1F)		
00~12:30	Mini lecture Library/Search/Game	14:00~15:00	Mini lecture Internet/Supercomputer
40~17:40	Briefing session about entrance examination of SOKENDAI	16:00~16:30	Mini lecture Security

National Institute of Informatics OPEN HOUSE 2013 Floor guide map

1F







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Our Twitter account is live and tweeting on NII and informatics. (^o^)/

Join the tweeting on Open House day with the hashtag #NINOW! Those tweets will automatically be projected on screen which will stand somewhere on the floor!



URL http://twitter.com/jouhouken

Hash tag for our openhouse 2013 #NIInow

NII starts on Facebook!

We will be posting notices on NII's initiatives, activities and research.







Friday, June 14

Opening

13:00~13:30

Director General at NII **KITSUREGAWA** Masaru

Keynote Lecture

Professor at Graduate School

Technology, Hokkaido University

/ Research Director of FRATO

Manipulation System Project, JST

of Information Science and

MINATO Discrete Structure

13:30~14:30

Open House

>> Hitotsubashi Hall(**2**F) capacity: **500**

Masaru Kitsuregawa, NII's new director general from April 2013, will offer words to begin the Open House and introduce some of the activities on which NII is working.

>> Hitotsubashi Hall(**2**F) capacity:**500**

"Power of Enumeration" — State-of-the-art Algorithms for Tackling Combinatorial Explosion

Today we often faced with a problem which leads to combinatorial explosion. such as electric/communication/traffic network control, large-scale system diagnosis, and gene data analysis. This talk presents recent research results on "discrete structure manipulation systems" for tackling such hard problems.

MINATO Shin-ichi

16:00~17:00 Professor at NII **SATOH Shin'ichi**



Observing Society via Television – Challenge to Social Analysis by Using Large-Scale Broadcast Video Archive

We can obtain many interesting aspects only by watching televinsion, e.g., what's going on in Japan and world, what is the current trends, how is economic activities, and so on. This talk will introduce couple of trials to automatically analyze such information by computers.

Session

10:30~12:00

For: Faculties of university-related institutions, IT vendors operating academic information infrastructure

13:30~17:00

For: Library staff at university-related institutions

>> Special Conference Room(1F) capacity:70

SINET and GakuNin that support development/ use of academic ICT cloud systems

The move toward controlling academic information on cloud systems has been active since the major earthquake in 2011. This session reports on the latest trends in cloud services offered via SINET and the Academic Access Management Federation (GakuNin).

Building the future of electronic resources with university libraries - What electronic resources can do now and should do from now

How do we manage electronic journals, books and other resources and offer them to users in the form of a service? This is an issue all university libraries face today. Among the various ways in which NII has long been involved in this issue, this session will offer a talk on the Electronic Resource Database (ERDB) project that NII began last year and on its application to CiNii. The session will offer a lecture as well as a demonstration of the system and time for panel discussions.

Saturday, June 15

Keynote Lecture

13:00~14:00

IGARASHI Takeo

15:00~16:00

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

Can a robot join in an Ido-bata kaigi?

Assistant Professor at NI **BONO Mayumi**



Mini Lecture	>>> Special C
11:00~11:30	
For: highschool students & university students Scholarly and Academic Information Div., NII TAKAHASHI Nanako	Libraries as
11:30~12:00	
 For: highschool students & university students Associate Professor, NII OHMUKAI Ikki 	Web Search Forward
12:00~12:30	
 For: highschool students & university students TOPSE Project, NII NAGAKU Masaru 	How to Mak Function Pr

>> Hitotsubashi Hall(**2**F) capacity: **500**

Design Everything by Yourself – User interfaces for graphics, CAD modeling, and robots-

I will introduce our research project (design interface project) aiming at the development of various design tools for end-users. We live in a mass-production society today and everyone buy and use same things all over the world. This is cheap, but not necessarily ideal for individual persons. We envision that computer tools that help people to design things by themselves can enrich their lives. To that end, we develop innovative interaction techniques for end users to (1) create rich graphics such as three-dimensional models and animations by simple sketching (2) design their own real-world, everyday objects such as clothing and furniture with realtime physical simulation integrated in a simple geometry editor, and (3) design the behavior of their personal robots and give instructions to them to satisfy their particular needs.

Can a robot gossip besides the well?* Such a phenomenon is not yet possible. In this Ido-Robo project (from the words for "the well side" and "robot"), we hope to build the infrastructure that will enable robots to congregate and engage in small talk. This project has an interdisciplinary research framework involving scholars in linguistics, cognitive science, information science, sociology, and robotics. In this keynote speech, we introduce methodologies for interaction studies and conversation analysis, which are essential to our project.

(*) Ido-bata kaigi (congregate at the side of a well) is a Japanese concept that reflects how Japanese women living in a village used to chat, circulate gossip, and exchange community information as they gathered beside a well and washed clothes and pumped water from the well. Now, the phrase refers to spontaneous congregations that serve as hubs for the communicative, intellectual, and political life of Japanese people.



Workshop	>>> Small Conference Room(2 F) cap	acity: 50	Friday, June	e 14
11:00~12:00 For: highschool students & university students Associate Professor, NII ECHIZEN Isao	Privacy Visor: To Protect Your Personal Information	プライバシー	14:40~15:00 ↓ Ken Hayami, Keiichi Morikuni ≧	C Computation, logic - Thinking al What is the least squares problem? A New Iterative Method We will begin by explaining what the leas great mathematician Gauss. Then, we wi images of stars in astronomy, and reconsive will explain our new algorithm based of
Mini Lecture	>> Small Conference Room(2 F) cap	acity: 50	15:00~15:20	B Architecture – The force to move
14:00~14:30 For: highschool students & university students Associate Professor, NII FUKUDA Kensuke	The Mechanism of the Internet $+ \alpha$	インターネット	Soichiro Hidaka	Transformations on Graphs that Rep Bidirectional Graph Tran Graph data structures can be obtained by are used as plans (models) for systemati used, for example, to automatically gen mechanism to bidirectionalize the data flo including synthetic biology and process very
14:30~15:00 ■For:highschool students & university students	A Supercomputer for	スパコン	Saturday, Ju	ne15
Professor, NII AIDA Kento	Everyone	2	12:30~12:50	F Network, security – Toward a se How to Learn Information Security K Let's Study Information Sec The Hikari & Tsubasa's information 3 choice que
16:00∼16:30 For:highschool students & university students	Security: Is Your Password	セキュリティ	Hitoshi Okada 	precise knowledge about information security. In t answer. There are 2 materials released by now. security policy. In "the Information Survival 3 cho find an exact answer. With this material you can le
Academic Authentication Systems Office, NII NISHIMURA Takeshi	Really OK?	*	14:10~14:30 Shoko Utsunomiya, Yoshihisa Yamamoto	A Quantum computing – Taking on Is it possible for coherent computer to Coherent computer for sol Required time resource to solve computa exponentially according to the problem sis "coherent computer" for solving NP cor show some basic properties of a coherer recent research progress of coherent com
			14:30~14:50	E Visual, audio, media – Identifying How to make 3D images? A Computational Approar Autostereoscopy or glasses-free 3D is the method of realized by associating an optical element such as p different approach to autostereoscopy is introduced, source. These panels are tailored so that a stereo:

Poster Exhibitions

10 OPEN HOUSE 2013

Presentation



out what information and calculation are

Its history, modern applications and new algorithm.

for Least Squares Problems

t squares problem is. Then, we will touch on its discovery by the ill introduce its modern applications, such as obtaining clear tructing images in electron microscopes in cell biology. Finally, n inner-iteration preconditioning.

resents Connections, and their Applications

sformations and their Applications

adding upward connections to the organizational charts. Graphs c development of computer programs. Models are conveniently herate computer programs. This presentation introduces the w through the transformation, attempts towards new applications rification, as well as issues for such applications.



nse of assurance

nowledge and Resilient Behavior?

urity and Resilience with Hikari & Tsubasa.

stion series is an FLASH made interactive educational material to learn the nis material, 4 university student characters talk each other to find an correct "The Information Security 3 choice Class" helps you learn the university's ice Class", you can experience the IT volunteer work where you can hardly arn how to become resilient under the situation of huge disaster.

challenges toward the unknown

o solve the NP complete problem in a polynomial time?

ving Ising models using a laser network.

ionally difficult problems such as NP complete problems grows the. We recently proposed new computational scheme which is a applete Ising models using laser network. In a presentation, we t computer by the comparison with a quantum computer and a buter.

their significance

ch to Autostereoscopy

Autostereoscopy or glasses-free 3D is the method of displaying 3D images without using any viewing gears. Autostereoscopy is often realized by associating an optical element such as parallax barrier or micro-lens array with a flat panel display. In this presentation, a different approach to autostereoscopy is introduced. In a multilayer display, multiple liquid crystal panels are stacked on top of a light source. These panels are tailored so that a stereoscopic view of a 3D scene is always observable from the display. After a brief explanation on the role of computers in a multilayer display, we will present a handy method to enjoy 3D images at home.

Demo / Experience corner

Conference Room (2F)



001

002

004

005

E Visual, audio, media – Identifying their significance

Extracting desired sound from mixture sound

Blind source separation based on auxiliary function method

Nobutaka Ono 🔤

In a real environment, various sounds are present and we usually here mixture of them. For example, even if you try to use the speech recognition function of PC, not only your voice but sound from TV close to you may be inputed togather. Even if you try to record the piano performance of your daughter at a concert, noisy sneezing of a man next to your seat may be recorded together. Aiming to recognize only target signal from mixutre sound, and edit or modify it as you like. we have developed a technique to fast separate mixutre sound into each of source with multiple microphones.

Network, security – Toward a sense of assurance

How to prevent privacy invasion through unintentional capture of facial images?

Privacy visor: Method for Preventing Unauthorized face image **Revelation Using Differences in Human and Device Sensitivity** Isao Echizen 🖃

A method is proposed for preventing privacy invasion through unintentional capture of facial images. Prevention methods such as covering the face and painting particular patterns on the face are effective but hinder face-to-face communication. The proposed method overcomes this problem through the use of a device worn on the face that transmits near-infrared signals that are picked up by camera image sensors, which makes the face in captured images undetectable. The device is similar in appearance to a pair of eveglasses, and the signals cannot be seen by the human eve, so face-to-face communication is not hindered

003

G Society and information – Fusing information world and the real world

Connecting Society and Academia with Data

LODAC: Building the Open Social Semantic Web Platform for Academic Resources

Hideaki Takeda 🔤 🛛 Ikki Ohmukai 🗔

The aim of the project is to provide an open and flexible platform for academic resources with Linked Open Data (LOD). LOD is the emerging technology which can realize the huge network of data just as the web realizes the huge network for documents. We are currently developing various LOD data silos, e.g., museum collections and biological species information. We are also developing some applications such as Yokohama Art Spot which is a mashup of local information from different data silos.

G Society and information - Fusing information world and the real world

Tokyo Virtual Living Lab: Smart City Simulation Health: Advanced Techniques for better Training and Information Provision

Marconi Madruga, Nahum Alvarez, Kugamoorthy Gajananan, Helmut Prendinger 🛄 Pascal Kuyten, Reinaert Molenaar

"An Experimental Space for Conducting Controlled Driving Behavior Studies based on a Multiuser Networked 3D Virtual Environment and the Scenario Markup Language", "ICO2: Multi-User Eco-Driving Training Environment based on Distributed Constraint Optimization", "Online Parameter Estimation of Microscopic Car-following Models", "Intelligent Biohazard Training with 3D Interaction and Real-time Task Recognition", "Automated Text to Dialogue Generation for Better Understanding Clinical Guidelines"

SNS, social media – Linking information

NoE on Social Project Management COMMUNIGRAM-NET Kenneth Brown, Jarbas Lopes Cardoso, Fernando Ferri, William Grosky, Yoshiharu Anders Frederic 🗔 Hirabayashi, Rajkumar Kannan, Epaminondas Kapetanios, Asanee Kawatrakul, Tetsu Tanabe

COMMUNIGRAM-NET is a Network of Excellence (NoE), which aims at integrating research and best practices that is currently conducted by leading research groups and educational organisations in the field of Social Project Management. Collaboration in the field of social project management, collective intelligence and knowledge creation is in the core of the COMMUNIGRAM-NET Network of Excellence.

Collective Intelligence based social project management **CI-Communigram**

Anders Frederic 🔄 Hideto Kojima

CI-COMMUNIGRAM is a collective intelligence-based platform for doing projects to foster innovation, knowledge creation and sharing, productivity and personal engagement.



Understanding users' information needs and intentions is the biggest challenge in the successful information retrieval. Eve gaze has possibility to indicate such users needs and intention behind the query or often under the conscious, and can continuously feedback to the system without any burden of the users. Here we have a demo of an image retrieval system with flexible user interface and continuous relevance feedback by users eye-gaze.

NII research cloud gunnii is a bare-metal cloud service by which researchers can deploy research environments on demand, easily. They can enjoy the bare-metal stable performance in the cloud instead of putting up with the

Graph transformation that can propagate modifications bidirectionally, and its applications

An integrated framework for developing well-behaved bidirectional

Soichiro Hidaka 🎴 Zhenjiang HU, Hiroyuki KATO, Kazuyuki ASADA, Keisuke NAKANO, John Wilson-Kanamori, Faiez Zalila

Model transformation in model-driven development plays an important role in formal treatment of development process. By composing larger transformation from smaller transformations in a systematic manner and propagating modification to the model in both direction (not only from source to destination but also backwards), the evolutional development process can be made robust. We demonstrate our tool for systematic development of well-behanved bidirectional model transformations, recent innovation and applications.

SIGVerse is an open software platform in order to design and investigate symbiosis society by human and robot. Users can design robot agents and throw them in a virtual environment to make embodied and social interaction experiment. Virtual robots also make interaction with real human through immersive interfaces. A worldwide robot competition BoboCup@Home adopted this simulator to realize a simulation competition on collaborative service robots. Please experience demonstration on interaction with cooperative intelligent robots.

The research and development of web-based diagnostic tests

Tetsuya Toyota, Masayuki Suzuki, Koken Ozaki, Ikko Kawahashi, Hiroko Yabe,

Support for learning is required to suit the needs of individual students. That is what we need to measure and diagnose students' mastery status of pre-defined skills, thereby providing them with detailed information regarding their specific strengths and weaknesses. Cognitive diagnostic test systems are the possible ways to aid teachers to direct students to more individualized remediation and help students to make self-study efficiently. A demo of Japanese vocabulary test will be shown as a part of the research.

Challenge to Bridging the Semantic Gap via Video Media Content Analysis

Video content-based retrieval is indispensable to access necessary information from broadcast videos or video archives in the internet. We are addressing video content-based retrieval for large-scale video archives via automatic extraction of video content information using video semantic analysis. This requires to solve so-called the bridging the semantic gap, which is known to be very challenging task, and we are tackling this issue using several techniques including image analysis, machine learning, and information retrieval. We will demonstrate our video search engine enabled by our research outcome.

G Society and information – Fusing information world and the real world

GLASE-IRUKA: Ostensive Interactive Image Retrieval System Based on Eye Gaze

Viktors Garkavijs, Pawitra Chiravirakul, Tetsuo Ishikawa, Diana Krusteva,



If you have some questions or want to discuss with researchers, please refer to the timetable below.

Conference Room



Saturday, June 15

11:00~12:00	A Quantum computing	C Computation, logic	F Network, security
	G Society and information	Others	
12:00~13:00	B Architecture	D Artificial intelligence	E Visual, audio, media
	H SNS, social media	Development and Operation	Special Exhibition
14.00~14.30	A Quantum computing	C Computation, logic	F Network, security
14.00	G Society and information	Pevelopment and Operation	Others
14.20 - 15.00	B Architecture	D Artificial intelligence	E Visual, audio, media
14:30/~15:00	H SNS, social media	Special Exhibition	
	A Quantum computing	B Architecture	C Computation, logic
16:00~17:00	D Artificial intelligence	E Visual, audio, media	F Network, security
	G Society and information	H SNS, social media	Development and Operation
	Others	Special Exhibition	





Α	Quantum computing – Taking on challenges toward the unknown	A01~A03	G	
			_	
В	Architecture - The force to move	B01~B11	н	
C	Computation, logic – Thinking about what information and calculation are	C01~C10	¥	6
D	Artificial intelligence - Making calculators think	D01~D10	m	6
Ε	Visual, audio, media - Identifying their significance	E01~E09	*	(
F	Network, security - Toward a sense of assurance	F01~F08		2





A01 Quantum information

Quantum information using Bose-Einstein condensates

Timothy Byrnes 🔤 Alexey Pyrkov, Ebubechukwu Ilo-Okeke

Many of us have heard of a quantum computer, but it is hard to imagine what this would really look like. Would it be something that would fit inside a laptop, or would it occupy an entire room like the first computers did? The answer to this is still unknown, because researchers across the world are trying many different approaches to try and build a quantum computer. We describe the various approaches to quantum computing, including ion traps, superconducting qubits, and quantum dots inside semiconductors. We also describe a new approach that we are working on, using Bose-Einstein condensates.

A02 Crowd Sourcing: Gaming for scientific problems

Qubit: The Quantum Computing Game

Simon Devitt Kae Nemoto, Helmut Prendinger

We introduce the Alpha version of "Qubit: The Quantum Computing game". This game is designed to crowd-source the optimization of quantum circuits. This problem can be translated to a puzzle problem that is amenable for release to the general public. Qubit will be released on Tablet devices and as a Web based game.

A03 Quantum information processing with coherent light and matter waves

Coherent Computer and Exciton-Polariton Condensates

Yoshihisa Yamamoto 🔤 Shoko Utsunomiya, Tim Byrnes, Michael Fraser, Tomoyuki Horikiri, Kenichiro Kusudo, Kai Yan, Kenta Takata, Yasuhiro Matsuo, Yorihiro Nobuta, Koki Matsushita, Taro Kambara, Yoshitaka Haribara

Light and matter exhibit both wave and particle properties in quantum physics. Particles in a coherent state oscillate with a same phase and frequency. Recently our group proposes a coherent computer to solve optimization problems using an injection-locked laser network. The poster will show some numerical simulation results and experimental results. Our other interest is the exciton-polariton condensates in a microcavity. Exciton-Polaritons are a composite particles of a photon and an exciton. The poster will explain some experimental results and potential applications.



Res Prin	earch Division
	ormation and Society Figure Graduate University for Advanced Studies
В	Architecture – The force to move
B01	ULP-HPC: Ultra-Low-Power High-Performance Computing Interconnection Techniques for ULP-H Michihiro Koibuchi I Ikki Fujiwara
	Recent supercomputers compute 10^15 operations per second by en- for a single parallel application. However, system performance wou power consumption. This limitation introduces difficulty in further sp surprisingly propose to use random topology, and analysis results sh
B02	Designing and Implementing Dependable systems
	Dependable Network-on-Chip Platform
	In automotive control systems, many and various types of ECUs (Electronic This causes serious problems such that the weight of the connection cab manufacturing cost are badly affected. This research project will develop are contained in one chip using dependable Network-on-Chip architecture
B03	Software Enhanced Monitoring
	Self-adaptive Software for Smart Sens
	Kenji Tei 🏹 Ryo Shimizu
	Software-controllable smart sensor system can improve qua presentation, we introduce research topics related to the self-healing for sensory data failure recovery, 2) self-adaptive 3) software development process for smart sensor system so
B04	How to develop self-adaptive system
	Software Development Process for Se
	Kenji Tei 🌂 Ryuichi Takahashi
	Software system has been used in various environment. In response structure and behavior to satisfy its requirements. Such capability is kno to (1) monitor changes in environment, (2) analyze and plan what chan presentation, research topics related to analyzing and designing such a
B05	Deliver Scientific Approaches to the Field of Manifacturing
	TopSE: Intellectual Manufacturing Educa
	Shinichi Honiden 🌂 🛛 Yoshinori Tanabe, Nobukazu Y
	The Top SE Project is a practical education program aiming to advanced development techniques based on the concept, "intelle students experience application of learnt techniques to practical lectures provided by professionals from universities and companie
B06	Promote world-leading research, education and practice for
	GRACE Center: Center for Global Research in Adv
×.	Shinichi Honiden 🏊
	GRACE Center is a world-leading software research center in l in alliances with research organizations in Japan and overs GRACE center seeks to put in place the foundations of 2 researchers and engineers who will go on to play central roles

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executing hundreds of thousands processor cores in parallel Id be limited by the inter-core communication latency and beeding up of supercomputers. To break this limitation, we how that random topologies achieve good system scaling.

for Automotive Applications

c Control Units) are used and placed everywhere in automobiles. ble reaches tens of kilos, and thus the running fuel cost and the a new centralized and dependable approach where many ECUs e, with only sensors and actuators left in original places.

sor Systems

ality of sensory data for a long period. In this poster self-adaptive software for smart sensor system; 1) e task allocation for shared smart sensor system, and oftware.

elf-adaptive Control Systems

to changes in environment, software should change its own own as self-adaptiveness. Self-adaptive system should be able nges are needed, and (3) execute the changes. In this poster a self-adaptive system with an example of control systems

tion Program based on Science

oshioka, Fuyuki Ishikawa

cultivate software engineers who have acquired highly ectual manufacturing education based on science." The problems through their graduation studies, in addition to es. About 200 alumni are active in various fields.

r cutting-edge software engineering vanced Software Science and Engineering

NII engaged in research, education and practical work seas and as part of industry-academia collaboration. 21st century software, while developing world-class s in the next generation.

B07 Toward Efficient and Highly Quality Software Development

State-of-the-art Technologies for Software Analysis, Testing, and Model Checking

Shinichi Honiden 🌂 Fuyuki Ishikawa, Yuta Maezawa, Tsutomu Kobayashi, Kazuki Nishiura, Keiichiro Hoshi, Takayuki Suzuki

Nowadays improving efficiency and reliability in software development is vital, since software is becoming complex. We propose support methods in various development stages such as software comprehension, testing, and verification of complex software behavior. The methods are based on state-based and mutation analysis in Ajax applications. Moreover, to derive sophisticated code with guarantee of correctness, we also improve Scala code derivation from proof of theorems. Further, for rigorous analysis of large and complex systems, we propose a method for planning proper refinement of formal specification.

B08 edubase Infrastructure Service for Cutting Edge IT Education

cultivation of engineers who will create future e-Society

Nobukazu Yoshioka 🏹 Shigetoshi Yokoyama, Masaru Nagaku

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

B09 enPiT: Education Network for Practical Information Technologies Cultivation of World-wide IT engineers

Nobukazu Yoshioka 🥄 Hiroko Sakurai, Fumihiro Kumeno

enPiT is a national education project for cultivations of world-wide IT engineers with cutting edge technologies. In detail, there are four education courses: cloud computing, security, cyber physical systems and business application. We promote a national-wide educational network on the four disciplines with not only academia but also industrial people. The educational program mainly focuses on practical teaching methods such as project-based leaning and problem-based leaning.

B10 Engineer Software through "Promises", Let Software Collaborate through "Promises"

Research on Analysis and Fulfillment of "Promises" in Computing and Engineering from Laws and Specifications to Cooperations of Services and Clouds

Fuyuki Ishikawa 🗔

As roles of software increase, compliance with "promises" such as laws and specifications becomes more significant but difficult. On the other hand, cooperation through "promises" is now common beyond organizations through web services and clouds. This presentation introduces our research on analysis and fulfillment of such "promises". We are tackling both of engineering (requirements analysis and formal methods) for development of software that satisfies "promises", and computing (autonomous cooperation and self-adaptation) of software that understands "promises"

B11 Utilizing dataspaces

Context-Preserving XQuery Fusion

Hiroyuki Kato 💷 Soichiro Hidaka, Zhenjiang Hu, Keisuke Nakano, Yasunori Ishihara

We solve the known problem of elimination of unnecessary internal element construction as well as variable elimination in XML processing with XQuery without ignoring the issues of document order. The semantics of XQuery is context sensitive and requires preservation of document order. We propose, as far as we are aware, the first XQuery fusion that can deal with both the document order and the context of XQuery expressions.



Research Division Principles of Informatics 🍳 Information Systems Architecture 🔲 Digital Content and Media Sciences Information and Society R Graduate University for Advanced Studies Computation, logic - Thinking about what information and calculation are C01 Software Evolution with Bidirectional Transformation Research on Software Development based on Bidirectional Model Transformation Zhen jiang Hu 🌂 Soichiro Hidaka, Hiroyuki Kato, Kazuyuki Asada, Keisuke Nakano, Kazutaka Matsuda Model transformations are a key element in the OMG's Model Driven Development agenda, providing a standard way to represent and transform software artifacts such as requirements, design models, program code, tests, configuration files, and documentation in software development. However, a source and target models of a transformation usually co-exist and evolve independently. How to propagate modifications correctly across models in different formats and guarantee system consistency remains an open problem. This project aims to solve this problem based on bidirectional model transformation. The success of the project would lead to a novel formal method for evolutionary software development, and a trusty tool for artifact synchronization. C02 Parallel Programming Framework for Big Data A High-level Parallel Programming Framework for Simplifying Big Data Processing Zhenjiang Hu 🔍 Yu Liu Existing distributed parallel programming models (e.g., MapReduce) are widely used such as in indexing web pages, log analysis, machine learning and so on. But how to systematically develop and optimize parallel programs remains as a big challenge. We propose a high-level framework for systematically and easily developing MapReduce programs, making use of the program calculational theories. Efficient MapReduce programs can be automatically derived under some rules. Users can write efficient programs without caring about parallelism nor much knowledge of MapReduce-programming. C03 Toward General Computation with GPU A Parallel Computation Model for GPUs Kunihiko Sadakane 🔤 Atsushi Koike We propose a novel computation model for GPU. Known parallel computation models such as the PRAM model are not appropriate for evaluating GPU algorithms. Our model, called AGPU, abstracts the essence of current GPU architectures such as global and shared memory, memory coalescing and bank conflicts. We can therefore evaluate asymptotic behavior of GPU algorithms more accurately than known models and we can develop algorithms which are efficient on many real architectures. C04 Novel Compression Schemes Genome Assembly using de Bruijn Graphs Kunihiko Sadakane Alexander Bowe We propose a new succinct de Bruijn graph representation. If the de Bruijn graph of k-mers in a DNA sequence of length N has m edges, it can be represented in 4m+ o(m) bits. This is much smaller than existing ones. The numbers of outgoing and incoming edges of a node are computed in constant time, and the outgoing and incoming edge with given label are found in constant time and O(k) time, respectively. C05 Lambda-Calculus and Type Theory TLCA Open Problem 20 Makoto Tatsuta This paper answers TLCA Open Problem 20, which is finding a type system that characterizes hereditary permutators. First this paper shows that there does not exist such a type system by showing that the set of hereditary permutators is not recursively enumerable. Secondly this paper gives a best-possible solution by providing a countably infinite set of types such that a term has every type in the set if and only if the term is a hereditary permutator. C06 Estimating the effect of medicine inside the human body Sampling Families of Solutions using the Cluster Newton Method for an Underdetermined Inverse Problem: Parameter Identication for Pharmacokinetics. Philippe Gaudreau (MOU Internship Student, University of Alberta) Ken Hayami, Akihiko Konagaya (Tokyo The Cluster Newton Method (CNM) has proved to be very efficient at finding multiple solutions to underdetermined inverse problems. In the case of pharmacokinetics, underdetermined inverse problems are often given constraints to restrain the variety of solutions. In this presentation, we present an improvement on the CNM that utilizes the two parameters of the Beta distribution to find families of solutions instead of randomly spread out solutions. This allows for a much greater control of the variety of solutions that can be obtained with CNM as well as facilitates the task of obtaining pharmacological feasible parameters.

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C07 Basics and applications of iterative solvers for least squares problems

Inner-iteration preconditioning for least squares problems and its application to image reconstruction problems

Ken Hayami 🔤 Keiichi Morikuni

Least squares problems are fundamentally important issues arising in the field of sciences, engineering, industries etc. This study develops solvers well-designed for large ill-conditioned least squares problems. We show that the solvers give a solution of any least squares problems and are more powerful than previous solvers by computer experiment. Moreover, we present an application of the solvers to image reconstruction problems arising from electron microscopes in biology.



Fast Exact Distance Queries on Large Networks by Pruned Shortest-Path Trees

Yuichi Yoshida 🔤 🛛 Takuya Akiba, Yoichi Iwata

We propose a new exact distance querying method on large networks. Our method precomputes and stores pruned shortest-path trees to efficiently answer distance queries. Our experiments show that our method outperforms other state-of-the-art methods for various types of large-scale real-world networks.

Applying Theory (Mathematics) to optimize difficult problems in the real world.

The travelling tournament problem - Applications to Japanese Professional Baseball Scheduling

Ken-ichi Kawarabayashi 🔤 Richard Hoshino, JSPS Fellow.

We apply mathematical tools to solve some hard practical problems. For example, we try to create a distance-optimal scheduling for the traveling tournament problem, i.e, each team plays every other team twice, once at its home and once at away.

C10 Adaptation in Computers

Resilient Distributed Systems

IchiroSatoh 💫

Computing systems should be resilient in the sense that it does not be only robust to but also adaptive to changes in their execution environments, e.g., applications, network topologies, and devices. This work aims at proposing several approaches to enabling software components running on computing systems, in particular distributed systems, to be adaptive to such changes in a self-organized manner, like a cellular differentiation mechanism.



Resea	arch Division
A Princ	iples of Informatics 🚬 Information Systems Architecture 🛄 Digital Content an
	nation and Society 🛃 Graduate University for Advanced Studies
DA	Artificial intelligence – Making
D01	Can computer reason about law?
	PROLEG: Implementation of Ultima
100	Le this presentation, we show an implantation of the ultimation
All	ultimate fact theory is a decision tool for a judge under ind each ultimate fact in civil code. We show correspondence use it for an implementation of the theory by logic programm
D02	How to use large amount of information with diversity?
	Integrating Various Information with
E	Ryutaro Ichise 🔤 🛛 Lankeshwara Munasinghe, Lihu
	It is easy to obtain large amount of various information now to integrate it with semantics. In this presentation, we show
D03	Systems Resilience
	A Challenge Problem for Dynamic C
÷.	Katsumi Inoue 🔤 🛛 Tenda Okimoto, Hei Chan, Nic
-0	After the 3.11 earthquake, many people have realized the shocks from unexpected incidents. In our research, we se that we call "systems resilience", which provides a set of
D04	How FAR is left for practical Machine Translation among
64	Pre-ordering methods for Chinese, I
÷.	Machine Translation
	Yusuke Miyao 💷 🛛 Dan Han, Sho Hoshino
X	Nowadays, people are sharing mass of information on the more crucial. In particular, while numbers of people speak systems for these languages cannot break communication focusing on research for practical machine translation and
D05	Science of reading behavior: how and what do you read
	Inference on Document and Cognitiv
÷,	Akiko Aizawa 🖃 🛛 Pascual Martinez-Gomez, Tada
	We aim to understanding what document and personal chara eye-movements. Using this information, we can discover what do allows us to transform documents to increase readability and leg
D06	Computer-Assisted Understanding of Mathematical Cont
	Retrieval and Semantic Analysis of M
E	Akiko Aizawa 🔄 🛛 Goran Topic, Minh-Quoc Nghie
-	Mathematical expressions are one of the important means of

C09

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Poster Exhibitio



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ate Fact Theory in Civil Litigation

te fact theory in civil litigation by logic programming. The complete information by attaching the burden of proof for between logic programming and ultimate fact theory and ming.

h Semantics

a Zhao, Md Mizanur Rahoman

adays.In order to use such information efficiently, we need v semantic technologies for the problem.

onstraint-Based Agent Systems

colas Schwind, Tony Ribeiro

importance of building resilient systems that can absorb at out to establish a new challenging research discipline f unified design principle for building resilient systems.

g Chinese, English, and Japanese?

Internet, and differences in languages become more and k Chinese, English, or Japanese, no machine translation on barriers among ordinary people. We, therefore, are nong these languages.

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ve characteristics using Eye-data

yoshi Hara, Kyohei Tomita, Yoshinobu Kano

acteristics influence reading behavior by analyzing people's ocument characteristics cause unnecessary cognitive effort and gibility. Our research also helps us to gain cognitively-motivated in information recommendation systems.

tent

lathematical Formulae

em, Giovanni Yoko Kristianto

of scientific communication and used not only for numerical concept definitions and disambiguating formal operations. o support understanding and utilization of mathematical as and their surrounding texts.

D07 Computational Reading of Scientific Papers

Language-based Analysis of Scientific Information — From Text-Mining to Reasoning —

Research Center for Knowledge Media and Content Science 🖃

When people read a scientific paper, they not only see one word after another, but also think over the "content" represented in the paper by associating their own knowledge or other research with the content, which leads to their "deep understanding of the paper". It is, however, not easy for people to repeat such work for a huge number of papers with a great diversity of "content". We are currently developing fundamental technologies for assisting this "deep understanding of the content of a paper".

D08 Todai Robot Project

A new horizon in informatics opened up by computers getting to the heart of human intelligence required in university entrance exams

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Noriko Araj 🖸 Akiko Aizawa, Tetsunari Inamura, Takeaki Uno, Noriko Kando, Shinichi Sato, Yusuke Miyao, Ai Kawazoe, Takuya Matsuzaki, Madoka Ishioroshi, Yoshinobu Kano, Ran Tian, Tadayoshi Hara, Hikaru Yokono

We will introduce the NII grand challenge project known as "Todai Robot Project." This project aims to add a new dimension to the current information technology and bring a deeper understanding of human intelligence, by setting a concrete goal: development of a computer which is able to pass university entrance exams. We will show major difficulties and challenges we are facing, and introduce several promising approaches.

D09 Common Toolkit for University Entrance Examination Solvers

Compatible Components of Question Answering System and Entrance Examination Solver/Scorer Workflow

Yoshinobu Kano 🔽 Noriko Kando

The "Can Robots Enter the University of Tokyo" project aims to create artificial intelligence software that can automatically answer the entrance examination. Creating such a complex software requires a large amount of time if made from scratch. We aim to provide a common toolkit for the software creation to save developers' time allowing them to concentrate on their interested tasks.

D10 How Effectively Computers Search Information

NII Testbeds and Community for Information access Technologies (NTCIR)

Noriko Kando 🖸 🛛 Akiko Aizawa, Hideo Joho, Tsuneaki Kato, Teruko Mitamura, Yusuke Miyao, Douglas Oard, Tetsuya Sakai, Mark Sanderson, Koichi Take

NTICR provides a large-scale re-usable common research infrastructure for innovative challenges in information access technologies. Its purpose is to leverage the researches in information access and to create new future values through running a workshop in an 18-month cycle, which has attracted more than 100-130 research groups internationally. NTCIR-10, its latest version, has tackled on 8 innovative research tasks - Cross-language link discovery, Search results diversification and intention mining and 1-click search in Web search, Math retrieval, Medical Natural Language Processing, Patent Machine Translation, Inference in text and its challenge to University Entrance Exam (with collaboration with Todai Robot Project), and Spoken Document Retrieval.



Research Division Degree of difficulty Principles of Informatics 🍳 Information Systems Architecture 🔲 Digital Content and Media Sciences For For the Others public researchers Information and Society R Graduate University for Advanced Studies Visual, audio, media – Identifying their significance E01 Can rays go through walls and pillars by advanced image processing? Towards light field processing based on (de)composition of visual information Kazuya Kodama 🖃 Yusuke Minato When we would like to reuse inexpensive but narrow spaces for cultural activities such as plays, concerts and movies, our sight is often limited significantly by pillars and walls. However, in the near future, Japanese cities should be much more compact by reusing them effectively because of our population composition. We introduce advanced technologies of image processing for light field transmission beyond pillars and walls, which enable us to solve the visual problems. E02 High fidelity 3D modeling of real objects Photometric metric under unknown lighting for range image registration 100 Akihiro Sugimoto 🖃 Diego Thomas We derive a new photometric metric for evaluating the correctness of a given rigid transformation aligning two overlapping range images captured under unknown, distant and general illumination. We estimate the surrounding illumination and albedo values of points of the two range images from the point correspondences induced by the input transformation. We then synthesize the color of both range images using albedo values transferred using the point correspondences to compute the photometric re-projection error. This way allows us to accurately register two range images by finding the transformation that minimizes the photometric re-projection error. E03 Visual attention extracted from video with auditory information Incorporating auditory information to compute a visual saliency map for video 100 Akihiro Sugimoto 🔄 Jiro Nakajima Current visual saliency maps, which represent visual attention of a human being, are computed from an image or a video using only image features. Our attention, however, is drawn by not only visual information but also auditory information. We introduce our approach to computing a visual saliency map that uses auditory information in addition to image information. E04 Immersive Visual Communication Eye gaze prediction & analysis for video observer Gene Cheung 🛄 When a human observer watches a video clip, where is he looking at? Can we guess? To what extent does it depend on the video, and to what extent does it depend on the viewer? We discuss our preliminary research on gaze prediction & analysis. E05 Efficient retrieval of similar data items A General Model of the Intrinsic Dimensionality of Data Hisashi KASHIMA(U. Tokyo), Michael NETT(U. Tokyo, NII) Michael E. Houle We propose a framework for the characterization of data sets in data mining applications, in terms of their intrinsic dimensionality. Our model can be viewed as a generalization of the expansion dimension, which was originally proposed for the analysis of certain similarity search indices using the Euclidean distance metric. Here, we extend the original model to arbitrary distance distributions. We also provide a practical guide for estimating both local and global intrinsic dimensionality for certain distance metrics. The estimates of data complexity can subsequently be used in the design and analysis of efficient algorithms for data mining applications such as search, clustering, classification, and outlier detection. E06 Efficient retrieval of similar data items Note : NJIT = New Jersey Institute of Technology Multi-Step k-Nearest Neighbor Search Using Intrinsic Dimension Xiguo MA (NJIT), Michael NETT (U. Tokyo, NII), Vincent ORIA (NJIT) Michael E. Houle Most existing solutions for similarity search fail in handling queries with respect to high-dimensional distance functions or adaptable distance functions. For such situations, multi-step search approaches have been proposed which consist of two stages: filtering and refinement. The filtering stage of the state-of-the-art multi-step search algorithm of Seidl and Kriegel is known to produce the minimum number of candidates needed in order to guarantee a correct query result; however, it may still produce an unacceptably large number of candidates. We present a heuristic multi-step search algorithm that utilizes a measure of intrinsic dimension, the (generalized) expansion dimension, as the basis of an early termination condition. Experimental results show that







our heuristic approach is able to obtain significant improvements while losing very little in the accuracy of the query results.

E07 Efficient retrieval of similar data items

Rank-Based Similarity Search: Reducing the Dimensional Dependence

Michael E. Houle Michael NETT(U. Tokyo, NII)

Virtually all known distance-based similarity search indices make use of some form of numerical constraints on similarity values for pruning and selection. The use of numerical constraints can lead to large variations in the numbers of objects examined in the execution of a query, making it difficult to control the execution costs. This presentation introduces a probabilistic data structure for similarity search, the rank cover tree (RCT), that entirely avoids the use of numerical constraints. The experimental results for the RCT, together with a probabilistic analysis, shows that purely combinatorial methods for similarity search are capable of meeting or exceeding the level of performance of state-of-the-art methods that make use of numerical constraints on distance values.



E09

How can you get reader impressions intuitively while searching books?

Color extraction method for creating a book cover image reflecting reader impressions

Isao Echizen 🔄 Tomoko Kajiyama (Aoyama Gakuin University)

The image on a book cover gives potential buyers not only an impression of the book's contents but also a clue for search and browsing before or after buying the book. We propose using a color extraction method as the first step in automatically creating book cover images that reflect readers' impressions. We constructed a database expressing the relationships between adjectives and colors and extracted colors from text such as sentences in the book and user reviews.

Fluorescence: Common Phenomena observed in Many Objects

Modeling Reality based on Fluorescent Components

Imari Sato 🖪

Fluorescence is a very common phenomenon observed in many objects, from natural gems and corals, to many kinds of paper we write on, and even our clothes. We show that the color appearance of such objects seen under different lighting can be represented as a linear combination of reflective and fluorescent components. The linear model enables us to effectively separate these two components using images taken under two different unknown illuminations. We also propose a novel technique called bispectral photometric stereo that makes an effective use of fluorescence for shape reconstruction.



Principles of Informatics 🍳 Information Systems Architecture 🔲 Digital Content and Media Sciences Information and Society R Graduate University for Advanced Studies Network, security – Toward a sense of assurance F01 How can we resolve A Method for Anonymizing User's Sensitive Information and for **Detecting Revelations on Social Networking Sites** Nguyen Son Hoang Quoc 🔂 Isao Echizen demonstrated by using it in an application for controlling the revelation of sensitive information on Facebook. F02 How to embed Security and Privacy in Software? **Research on Development Methods for Secure Software** 100

Research Division

Nobukazu Yoshioka Seiji Muneto, Takafumi Komoto

The security and privacy are important issues on modern society, as exemplified by personal information leakages and attacks on systems in recent years. Compared to other types of products and infrastructures, the technologies to enhance the security of information systems have not yet reached the stage of being adequate. This research aims to integrate security and privacy into software development methods to establish security software engineering technologies.

F03 Access Network Technologies for Disaster Recovery

Resilient Multihop Access Network for Disaster Recovery

Quang Tran Minh Kien Nguyen, Shigeki Yamada

Disasters may destroy everything including communications infrastructures isolating people in the disaster-stricken areas. Recovery of these infrastructures is often prolonged which is not suitable for disastrous fast-responses. This work proposes practical deployments of on-site configured access networks for disaster recovery. Although infrastructures are definitely damaged right after the occurrence of disasters, battery-based mobile devices (smart phones, laptops, tablet PCs) still work for some extended times. These mobile devices automatically change their modes, from the infrastructure mode into the ad-hoc mode, establishing multihop access networks. These networks are extended until still alive Internet gateways (IGWs) are reached providing Internet access to the victims. The proposed scheme requires no further equipments except commodity mobile devices which are ubiquitously available.

F04 Backbone Network Technologies for Disaster Recovery

Leveraging Software-Defined Networking (SDN) in Disaster-Resilient **Backbone Networks**

Kien Nguyen 🔤 Quang Tran Minh, Shigeki Yamada

Software-Defined Networking (SDN) is an emerging network architecture in which the control functions are decoupled from the forwarding and data processing elements. Moreover, SDN defines an open programmable interface between those elements, e.g., using OpenFlow protocol. The programmability enables new efficient data forwarding mechanisms in terms of flexibility as well as easiness. This work presents an approach of leveraging SDN in disaster-resilient backbone networks. Both the advantages and disadvantages of SDN in the context of disasters are discussed. Consequently, the potential solutions are proposed and extensively evaluated.



How to Learn Information Security Knowledge and Resilient Behavior? Let's Study Information Security and Resilience with Hikari & Tsubasa. Hitoshi Okada 🌅

The Hikari & Tsubasa's information 3 choice question series is an FLASH made interactive educational material to learn the precise knowledge about information security. In this material, 4 university student characters talk each other to find an correct answer. There are 2 materials released by now. "The Information Security 3 choice Class" helps you learn the university's security policy. In "the Information Survival 3 choice Class", you can experience the IT volunteer work where you can hardly find an exact answer. With this material you can learn how to become resilient under the situation of huge disaster.



Sensitive information about a user can be disclosed by the user's social networking site (SNS). We have developed a method for creating anonymous fingerprints not only anonymize a user's sensitive information but also can be used to identify a person who has disclosed sensitive information about the user. Moreover, a fingerprint cannot be converted by a discloser into one that causes the algorithm to incorrectly identify the person who disclosed the information in almost cases. The algorithm was

F06 Social compatibility between privacy information and incentives

Exchange privacy information with the service offer

Ake Osothongs 🛐 Noboru Sonehara

Big data becomes a new challenge to handle the large datasets effectively. A type of valuable data is the personal information, which usually is used in advertising such as location-based/ and behavior-based targeting advertising. A new problem is a privacy issue because of the risk by disclosing personal information. Many people are threatened by their privacy leaking such as spam, scam and crime. We purpose to develop a new trading platform between personal information and service offer. This research aims to find the compatibility between privacy information and incentives, to present a new negotiation mechanism, and then to show the comparison among groups of users.

To Access a service of universities securely via the Internet

Development of trustworthy Certificate Issuance System optimized to Universities

Masaki Shimaoka 🛐 🛛 Noboru Sonehara

Server certificate is essential for authentication and encryption, to provide various university services to faculty staff and students securely through the Internet. To obtain the server certificate, applicant requires several examinations by Certification Authority. However, some examinations are inappropriate to universities because they assume a company as applicant generally. We have developed the Certificate Issuance System that assures the trustworthy as the same as commercial Certificate Authorities, by the optimization of such examinations to University and the automation of some examinations.

F08 Privacy Preserving in data publishing, balancing Privacy Protection with Data Utilization An Efficient Local Recoding Anonymization in Data without Hierarchical Taxonomies

Sarrafi Aghdam Mohammad Rasool 🕙 Noboru Sonehara

To protect the privacy of individuals, a model that is widely used for privacy preservation in publishing micro-data, is k-anonymity. It reduces the linking confidence between sensitive information and specific individual. However, k-anonymous dataset loses its accuracy due to the information loss. Most of the existing k-anonymization approaches suffer from huge information loss. We propose a new model and SpatialDistance (SD) heuristic algorithm based on distance calculation between tuples including numerical and categorical attributes which is independent of attribute hierarchical taxonomies. Our extensive study shows that SD reduces the information loss significantly in comparison with existing well-known algorithms.



Information and Society 🔄 Graduate University for Advanced Studies Society and information - Fusing information world and the real world



Due to improvements in ICT and mobile technologies, hotel reservations for tourists and business travelers are made through online reservation systems. Thus, it is possible to capture the preferences and tendencies of the bookers by monitoring web reservation systems. However, since it is unclear if the online reservation data alone accurately reflects the reality, it is necessary to evaluate the system accuracy . We compare the online reservation data against the actual booking data obtained from accommodation providers to predict and visualize booking prices and room availability.

G02 Using Big Data for Efficient Procrastination

Using Twitter Graph Analysis to Predict Verified Accounts on Twitter Kelly Y. Itakura 🖸 Noboru Sonehara



Research Division

The purpose of this paper is to study the different graph structures on Twitter. Most studies on Twitter's graph structures employ follower-followee relationships. However, they are rather static and do not provide as much information as studying other relationships such as Retweeter-Retweetee. In this paper, we step further to study the relationships between three different graphs constructed by extracting 1) retweets 2) mentions, and 3) replies. We show that there is a structural difference between the retweet graph and the mention/reply graphs. Finally, we exploit this advantage to predict whether an account is verified or not by Twitter with F-measure of 0.853.

G03 Introducing a system for term management **R&D of a Term Management System**

Teruo Koyama 🔄

In this presentation, we introduce the requirements of term management systems, and the implementation of an experimentally system.

G04 Reducing Risks of Software-intensive Systems in Connected World **Reducing Risks of Software-intensive Systems in Connected World**

Shin Nakajima 💫

Software technologies are essential for the innovation in 21st century, and their faults put large impacts on our daily life. This poster presentation illustrates how the automated formal verification method can be a scientific basis for achieving the required reliability and safety levels of software-intensive systems.

G05 Finding place names automatically from text

GeoNLP: Software environment for the geo-tagging of natural language text

Asanobu Kitamoto 🖃

Finding and mapping place names automatically from text has a great need, and this technology is especially powerful when the situation needs to be recognized quickly under crisis. Based on geographic information systems (GIS) and natural language processing (NLP), we develop a geo-tagging software to annotate text with place tags, and establish the infrastructure of toponym information systems with a portal site for sharing place names.

G06	Recognition and communication on the crisis of the soci
	Crisis Informatics
÷.	Asanobu Kitamoto 🖪

How informatics can contribute to the crisis of the society, such as natural disasters like typhoons and earthquakes, or man-made disasters like nuclear disasters? We investigate how big data should be used for the acquisition, analysis, communication and presentation of crisis-related information.

F07

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G07 How is the result of academic research reported?

Academic research in press reports

Masaki Nishizawa 🔽 🛛 Yuan Sun

How is the result of academic research reported? The results investigated focusing on Press Releases and newspapers, are reported.

G08 World of international standards



Akira Miyazawa 🖸

International standardization of library RFID is now being developed under the ISO. Based on the experience of this standardization process, technology, structure of standardization, industry structure of stake holders are analyzed, and features and problems of international standardization processes are studied.



On Subjective Feeling of 'In-sync' Nobuhiro Furuvama 🔽

It is crucial to achieve between-person movement synchronization in music or sport performance as well as in daily cooperative activities, but the principle underlying it has not been fully understood yet. If we can grasp the regularities we should be able not only to apply the knowledge to education, physical, occupational, speech, or psychological therapies, etc., but also to design human-agent synchronization. In this presentation I will introduce to you studies on human movement synchronization, including our own contribution to the topic.



Automatic Traffic Incident Detection Based on Probe Car Data

Adachi Laboratory, NII/The University of Tokyo 🛃 Jun Adachi, Atsuhiro Takasu, Kenro Aihara, Mitsuki Kimura

Cyber-Physical System (CPS), which integrates information on cyber and physical spaces, is expected to make human society more efficient. As the first step of research on CPS, we use large scale sensor data from cars for the analysis of real-time automatic traffic incident detection. In this approach, we propose a novel feature based on "speed fluctuation" to detect traffic incidents with high precision rate



Reference of Informatics 🔍 Information Systems Architecture 🔲 Digital Content and Media Sciences Information and Society 🔄 Graduate University for Advanced Studies SNS, social media - Linking information H01 How do we promote eco-friendly behavior using SNS? Cohesive relation and relaxed relation -SNS design for promoting eco-friendly behavior-Saizo Aoyagi 🖸 Noboru Sonehara Nowadays, SNS is focused as an effective way for promoting eco-friendly behaviors. Nevertheless, participants sometimes drop out from such SNS and difficult to keep doing eco-friendly behaviors. In this study, a SNS design for promoting eco-friendly behaviors controlling communication stress in SNS, which is a sense of obligation of communication, is proposed. H02 Understanding and promoting human communication through a new smartphone application Network Navigator: A smartphone application for visualizing mobile communication Yuko Tanaka 🔄 🛛 Tetsuro Kobayashi, Tsutomu Suzuki Based on social capital theory, we developed an a smartphone application named "Network Navigator". We envision a society in which people communicate fruitfully each other through the infromation technology. The Network Navigator collects logs of mobile phone, SMS, and Gmail using an irreversible encryption method, visualizesusers' human relationship in terms of frequency of communication and strength of tie, and provides opportunities users to improve their communication. H03 Reputation sharing and cooperative society. The analysis of reputation sharing using smartphone log data. Takahisa Suzuki 🛃 🛛 Tetsuro Kobayashi It is theoretically predicted that cooperation is promoted when human reputation is effectively shared among groups or communities. However, it's not yet been clear in what context in the real world does reputation sharing manifests its effect. Using a novel methodology which capitalizes on human communication data collected through smartphone logs, this study tackles this issue H04 WebELS: Realizing a Globalization of Higher Education and Business by Cloud-based e-Communication Platform WebELS: Cloud-based e-Communication Platform Haruki Ueno 🔤 🛛 Arjulie John Berena, Sila Chunwijitra, Mohamed Osamnia, Naonori Kato, Hitoshi Okada, Yoshihito Gotoh, Hideomi Koinuma WebELS is a generalized cloud-based e-communication platform for "everywhere, anytime, everyone" use to support an integrated e-Learning / e-Meeting globally. H05 ANAQONDA Analogy Queries by Ontology-based Data Analytics Christoph Lofi 🔤 Nigel Collier Besides the tremendous progress in Web-related technologies, interfaces to access the Web or large information systems have largely stayed at the level of keyword searches and categorical browsing. In this project we explore analogy queries as one of the essential techniques required to bridge the gap between today's interfaces and future interaction paradigms. The intuitive concept of analogies is directly derived from human cognition and communication practices, and is in fact often considered to be the core concept of human cognition. In brief, analogies form abstract relationships between concepts, which can be used to efficiently exchange information needs or transmit even complex concepts including important connotations in a strictly human-centered and natural fashion. Building analogy-enabled information systems opens up a number of interesting scientific challenges, e.g., how does communication using analogies work? How can this process be modeled? How can information systems understand what a user provided analogy actually means? How can analogies be discovered? This project aims at addressing these questions and developing suitable analogy-enabled prototype systems. H06 What kinds of emotions do online people express in earthquake situations? Twitter emotion analysis in earthquake situations

Research Division

Bao-Khanh Ho Vo 🔤 Nigel Collier

Social media is becoming a precious and important source of information where users often express their attitudes towards a concerning problem or a particular event. The task of determining these attitudes is called emotion analysis, an application of natural language processing, computational linguistics, and text analytics. Clearly, emotion analysis is classifying users' emotions to different emotion types such as fear, surprise, relief, joy, etc. Because emotion only observed obviously in crisis events like earthquakes, emotion analysis in earthquake situations allow authorities and social managers to understand attitudes and worries of affected people.



Development and Operation

101 To provide a greater variety of network services and to respond more flexibly to changes in users' requirements Science Information NETwork 4

Academic Infrastructure Div., Cyber Science Infrastructure Development Dept.

Science Information NETwork (SINET) is an information and communication network connecting universities and research institutions throughout Japan. SINET4 commenced operation in April 2011. We provide higher network speed, diverse services, higher edge node stability, higher access lines and upper layer deployment. The "SINET Promotion Office" promotes the use of service as well as last year.

GakuNin realizes collaborative research environment beyond the barrier between different organizations Development of nationwide collaboration environment by GakuNin

Academic Infrastructure Div., Cyber Science Infrastructure Development Dept.

The Academic Access Management Federation in Japan (GakuNin), through ties to university authentication infrastructure, is a system that brings about, as well as intra-school services, one-stop authentication of affiliated universities, external academic cloud services and industrial electronic journals. Through the use of GakuNin, with one account, users can use all the academic resources on the network. In this presentation we introduce the system which manages various groups of GakuNin users beyond the barrier between different organizations. We also present several examples of associated services in production for collaborative research activity.

103 Enabling a wide range of users to easily utilize distributed supercomputers including "K Computer"

Authentication System for Convenient, Reliable and Secure Access to **Distributed Supercomputers (HPCI)**

Academic Infrastructure Div., Cyber Science Infrastructure Development Dept.

High Performance Computing Infrastructure (HPCI) aims to build computational environment, which meet the needs of various users in academics and industries, by federating the K computer in Kobe as a core system and supercomputers in universities and research institutes in Japan. NII operates the authentication system, including the certificate authority, in HPCI. The authentication system enables single sign-on to computing and storage resources using digital certificates. The user is able to access the resources in a secure and convenient way. Additionally NII operates SINET4 provides network infrastructure in HPCI for using remote supercomputers and sharing large experimental data.

Promoting establishment of next-generation information infrastructure indispensable to the academic community Construction of the Next-Generation Academic Information Infrastructure

Scholarly and Academic Information Div., Cyber Science Infrastructure Development Dept.

National Institute of Informatics (NII), in close collaboration with university is attempting to generate and secure content that are indispensable to the academic community, and to build an information infrastructure that will give added value to and broadly transmit these content. Specifically, NII provide comprehensive academic content services, including GeNii(NII Scholarly and Academic Information Portal) and NACSIS-CAT/ILL(Catalog Information Service : Cataloging System / Interlibrary Loan System). NII also support for construction of institutional repositories collecting, preserving, and disseminating research produced in universities.

Others

Introduction of the Graduate School (SOKENDAI: Chiyoda Campus)

Outline of Department of Informatics and entrance exam guide for 2013 fiscal year

Graduate University for Advanced Studies (SOKENDAI)

NII establishes Department of Informatics, School of Multidisciplinary Science at Graduate University for Advanced Studies (SOKENDAI), and offers both 5 year and 3 year doctoral programs. These 2 courses make the best use of the speciality of NII that is pioneering and international research institutions of informatics, and aims at the promotion of the excellent talent who leads "Knowledge society" of the 21st century. It is located in the center of Tokyo, this good location enable busy students with job come to NII easier to learn and research. It has been registered more than 70 students, about half of them are international students, and 30% of them are working students. We guide the outline of Department of Informatics and entrance exam for October 2013 and April 2014.

202 The Wave of Informatics Spreads, from Shonan to the World at Large

S Information and Society R Graduate University for Advanced Studies

where We Create a Place to Promote Informatics

NII Shonan Meeting

Research Division

The residential informatics seminars held in the small town of Dagstuhl, in the southwest of Germany, offer researchers a place to exchange ideas and discuss the issues they are currently working on, playing an important role in the promotion of the informatics field. February of 2011 marked the holding of the first "NII Shonan Meeting", modeled on the Dagstuhl seminars and total 20 seminars were held. Through the seminars, we intend that Japan becomes a center of informatics in Asia.

Special Exhibition

301 National Archives of Japan, Digital Archive: "Past is Prologue" National Archives of Japan

National Archives of Japan (NAJ) launched "Digital Archive" from 2005, providing catalogue database and some of its holdings in digital images. With the concept of "ubiquitous internet service," the system is based on the next generation of digital archival standards, such as JPEG2000 and EAD/XML. NAJ holds demonstrations and displays of "Digital Archives," with its precursor, Japan Center for Asian Historical Records (JACAR).

302 Tokyo Association of Dealers in Old Books

"Nihon-No-Furuhon-Ya" (Old Japanese Book Shop System): search site for antipue books

Tokyo Association of Dealers in Old Books

Tokyo Association of Dealers in Old Books launched an antiquarian database in 1998, and this database has been appreciated ever since by researchers and book lovers nationwide. Now, the burning issue I how antiquarian bookshops with rich philological knowledge can cooperate with the young generation, which can make full use of computers. "Nihon-No-Furuhon-Ya" is now in the process of development

303 To pursue a new era of academic research

Research Organization of Information and Systems

Research Organization of Information and Systems

The Research Organization of Information and Systems establishes and operates a core research institute for promoting integrated research on a global level in the areas of polar sciences, informatics, statistical mathematics, and genetics, in collaboration with the research communities at universities and other organizations all over Japan. The Organization also aims to conduct integrated research across disciplines by addressing, from the perspectives of information and systems, issues involving complex phenomena of life, Earth, the natural environment, human society, and other areas, as critical issues for the 21st century.

304 Service that connects seamlessly to a variety of information

Research Center for Informatics of Association

Currently, cultural information in various fields has been digitally archived. We have developed a system which connect in an integrated manner information for expanding the range of utilization. In cooperation with the NHK Broadcasting Culture Research Institute, we are developing "Broadcasting Culture archive service". This service involves a system which can view the testimony with reference to relevant information, and a chronology system which can organized the matters related to broadcasting by theme and age. In cooperation to the cultural facilities in the region, we are developing a system that can be viewed in association with the space-time information, the old photographs and old maps, which look back the life of the community. We will demonstrate these in the open house.

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Construction of browsing support system to encourage the utilization connecting the heterogeneous information sources

NHK Broadcasting Culture Research Institute, National Research Institute for Cultural Properties, Tokyo