

日仏ワークショップ



stfr WIDE



2013  
6月4日 (火)

Tokyo, June 4, 2013 (Tuesday)

9:00~17:40

# JAPANESE-FRENCH WORKSHOP ON THE INTERNET FOR THE FUTURE SOCIETY

# 2013

## インターネットの未来社会に向けた挑戦

会場/Venue:

慶應義塾大学

三田キャンパス 北館ホール

Keio University

Mita Campus, North Bldg. Conference Hall

使用言語:英語

Workshop in english

<http://jfif13.lip6.fr/>



# Japanese-French Workshop on the Internet for the Future Society

Organized by **Societe Franco-Japonaise des Techniques Industrielles**

Sponsored by **Ambassade de France au Japon**

Hosted by **Keio Research Institute at SFC and WIDE Project**

The Internet technology has matured and latest developments provide an opportunity to address the numerous critical societal challenges that our societies are facing. This workshop provides a unique forum for leading researchers and practitioners in France and Japan, to share research questions and explore potential for innovations in these areas. In the morning sessions, researchers from France and Japan introduce latest research and technical challenges. The topics include Internet of Things, machine-to-machine communications, open data access and geo-location information, new Internet architecture, content caching, and mobility. The afternoon session invites speakers from industry to share their perspectives for future technologies and examine the roles of the Internet in their views. The panel session aims at discussing technical challenges for the Internet to enable people to build future information society. The discussion will cover connecting 8 billion people on the earth, building testbeds and allowing reproducible network experiments, handling massive data, considering future devices and security and privacy implications, and other ambitious challenges.

## Program

**9:00 - 9:30** Opening Address (30 min)

**Florence Rivière-Bourhis** (Ambassade de France au Japon)

**Jun Murai** (Keio University)

**Serge Fdida** (UPMC)

**Philippe Codognet** (UPMC/Univ. of Tokyo): Japanese-French Laboratory for Informatics

**9:30 - 10:50** Research Perspectives 1 (80 min)

**Eric Fleury** (ENS-Lyon)

Internet of Things Laboratory: A vanilla flavour

**Michel Diaz** (LAAS)

Machine-to-machine communication for the Internet of Things

**Hiroshi Esaki** (Univ. of Tokyo)

Open Smart City Based on "Internet of Design" Discipline for Sustainable Growth and Innovation

**Thomas Noel** (U. Strasbourg)

Why we need a new architecture for the Internet of Things

**10:50 - 11:10** Break

**11:10 - 12:30** Research Perspectives 2 (80 min)

**Patrick Senac** (ISAE)

On the emergence of temporal structures in dynamic networks:

When the edge of the Internet becomes the core

**Thomas Silverston** (U. Nancy)

Popularity-based caching in CCN

**Nobuo Kawaguchi** (Nagoya University)

Crowdsourcing of Location based Information and OpenData Integration

**David Simplot-Ryl** (INRIA)

Back to the basics: Neighborhood discovery in mobile ad hoc networks

**12:30 - 13:50** Lunch Break

**13:50 - 15:30** Business Perspectives (100 min)

**Ryutaro Kawamura** (NTT)

Requirements, expectations and controversies surrounding the future Internet

**Guillaume Chelius** (HiKoB)

Industrial Internet, Internet of Things, Big Data : Business Opportunities, Pure Players vs Brick & Mortar

**Sachiko Yoshihama** (IBM Research Tokyo)

Frugal Innovation for Smarter Transportations in Developing Countries

**Vania Conan** (Thales)

User centric offloading – Using terminal-to-terminal connections to offload congested radio access networks

**15:30 - 16:00** Break

**16:00 - 17:30** Panel: Challenges towards Future Society (90 min)

**Kenjiro Cho** (IIJ) - Moderator

**Serge Fdida** (UPMC) - Moderator

**Jun Murai** (Keio University)

**Shinji Shimojo** (Osaka University/NICT)

**Vania Conan** (Thales)

**Takeshi Natsuno** (Dwango/Keio University)

**Kave Salamatian** (Université de Savoie)

**17:30 - 17:40** Closing

**Katsuya Okimi** (SFJTI)

## Organization

### General co-chairs

Jun Murai (Keio University)

Serge Fdida (UPMC Sorbonne Universités)

### Vice chair

Shinji Shimojo (Osaka University/NICT)

### Program co-chairs

Kenjiro Cho (Internet Initiative Japan)

Marcelo Dias de Amorim (CNRS and UPMC Sorbonne Universités)

### Workshop coordinator

Katsuya Okimi (SFJTI)

### Local arrangements

Katsuyuki Hasebe (NTT Communications)

## About Speakers and Talks

**Eric Fleury** Professor, Ecole Normale Supérieure de Lyon

### Internet of Things Laboratory: A vanilla flavour

A large-scale infrastructure for testing the Future Internet of Things:

- A “smart house” that regulates ambient temperature according to outside weather and the preferences of its inhabitants?
- Intruders detected by sensors that then send robot monitors to investigate?

• A burning building that automatically dispatches a floor plan to firefighting teams, showing the real-time location of safety equipment and people at risk? These may sound like science fiction but they could become reality sooner than you think. Our society is moving towards the “Internet of Things”, a world in which most communication over networks will be between objects rather than people. Many of these objects will be small, low-power, portable devices that are embarked on larger objects, such as vehicles, furniture, industrial machinery, or articles of clothing. We call these “embedded communicating objects”.

Through its IoT-LAB testbeds, the FIT project will provide a very large-scale infrastructure suitable for testing heterogeneous embedded communicating objects of all sorts. The five Federated IoT-LAB testbeds developed within FIT will encompass the following test environments:

- Internet
- wireless networks
- mobile networks, sensor and actuator networks (SANETs)
- home gateways and access networks
- low-power and lossy networks (LLNs).

The testbeds will include a fleet of mobile robots which can be deployed to simulate a wide variety of different scenarios. The movement of each robot is controllable, and several smart objects can be embedded on each to simulate a Body Area Network. These mobile objects may act as an ad hoc network or use the fixed infrastructure that surrounds them to communicate via a real or emulated network. With full control of the network nodes and an access to the gateways these nodes are connected to, researchers are able to monitor their energy consumption as well as network-related metrics such as the end-to-end delay, throughput or overhead.

*Eric Fleury is a full professor (first class professor) at Ecole Normale Supérieure de Lyon (ENS de Lyon). ENS de Lyon is one of the most selective institutions in the higher education French system. ENS de Lyon is associated with a strong French tradition of excellence and public service. Eric Fleury works in ENS Lyon Computer Science Lab. Since his PhD in 1996, Eric Fleury has conducted research activities in three main directions. He first contributed to parallel algorithms, distributed memory architectures, wormhole communications and routing, obtaining results on general theory for deadlock free routing. His activities have been gradually moving from networking protocols & distributed algorithms to Wireless Sensor Networks as a way to measure and collect real data of large scale in situ networks. His activities concern also the study and analysis of dynamic networks. Eric Fleury works in particular on social networks, community detection and spreading phenomena. Recently he successfully launched Fellows, an experiment on Facebook to evaluate a novel graph metric of the cohesion of a community. In this specific context of real networks and application of Information Science and Technologies (like in the MOSAR project and FIT project), his scientific activities aim at tackle challenges posed by societal issues.*

**Michel Diaz** Research Director, LAAS-CNRS

### Machine-to-Machine communication for the internet of things

Future communications will have to deal with information coming from all things, objects and domains in all technologies and sciences, including in particular environment, life and energy. For over a few years now, novel and challenging multidisciplinary programs have been launched for interconnecting different domains. In particular, a transversal research and experimental project for designing and validating the architectures and components of multidisciplinary systems of systems, ADREAM, has been started at LAAS-CNRS. The evaluation platform is a new innovative unique building that has been defined as an advanced environment for the design and validation of ubiquitous energy-aware systems and that rely on pervasive computing and distributed intelligence. The building integrates mobile and fixed autonomous devices, sensors, actuators and robots, and is powered by a massive photovoltaic production of 100 KWc. After its first 6 months of behavior, it appears that contextual environment acquisition and machine-to-machine communication are the first systems that are needed to master such complex architectures. This talk will present the global research framework, the ADREAM project, the experimental building, and the present and future solutions and requirements that are needed to design and deploy the next generation of communication supports in cyber-systems or systems of systems.

*Michel DIAZ was member of the board of directors of LAAS-CNRS and director of the French research on Architecture, Networks, Systems and Parallelism. Expert for European and French programmes, he served in many Program Committees, is the editor of twelve books and more than 300 publications. He is working now on architectures and communications for systems of systems. He initiated and coordinates the ADREAM project. He received the Silver Core of the IFIP, is Senior Member of the IEEE, member of the New York Academy of Sciences and listed in the Who's Who in Science and Engineering.*

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

### Open Smart City Based on "Internet of Design" Discipline for Sustainable Growth and Innovation

Future Internet must contribute to the improvement of efficiency and sustainability (e.g., BCP, global warming effects) regarding the all the activities developed and deployed on the globe. The Internet system discussed in this presentation is not only meant the global computer network using the IP (Internet Protocol), but is rather logical and abstracted architecture of the system, such as smart city, based on "Internet of Design" discipline. Openness, transparency and alternatives are the key of "Internet of Design". The smart-city must achieve the sustainability of economical growth and innovations. The presentation focuses on smart energy management and control, which is one of critical challenges in 21st century. As for the target of smart energy management and control, we must

design and implement the Eco-System, which includes energy "Saving", "Efficiency/Productivity" and "Security" simultaneously. In this presentation, the speaker introduces the GUTP (Green University of Tokyo Project, [www.gutp.jp](http://www.gutp.jp)), which has delivered the IEEE1888 for management and control plane of smart city, is promoting open smart city system development with practical test-bed with the technical backgrounds.

*He received the B.E. and M.E. degrees from Kyushu University, Fukuoka, Japan, in 1985 and 1987, respectively. And, he received Ph.D from University of Tokyo, Japan, in 1998. In 1987, he joined Research and Development Center, Toshiba Corporation, where he engaged in the research of ATM systems. From 1990 to 1991, he has been at Applied Research Laboratory of Bellcore Inc., New Jersey (USA), as a residential researcher. From 1994 to 1996, he has been at CTR (Center for Telecommunication Research) of Columbia University in New York (USA). During his staying at Columbia University, he has proposed the CSR architecture, that is the origin of MPLS(Multi-Protocol Label Switching), to the IETF and to the ATM Forum. From 1996 to 1998, he has conducted the CSR project in Toshiba, as a chief architect. He is an executive director of IPv6 promotion council, which is cross ministry and cross industry council to promote the IPv6 technology. He is a vice chair of JPNIC (Japan Network Information Center), since 2006, and has served as an IPv6 Forum Fellow. From 2006-2010, he served as BoT(Board of Trustee) for ISOC (Internet Society). He is a director of WIDE Project since 2010, director of Japan Data Center Council since 2009, and director of Green University of Tokyo Project since 2008.*

**Thomas Noel** Professor, Université de Strasbourg

#### **Why we need a new architecture for the Internet of Things**

Internet of Things introduces new challenges to support more and more sensors or actuators connected to Internet. This paradigm is not without raising issues in term of complexity to design new (simple, scalable, etc.) protocols to support these devices. We will present a new approach : simple, low-overhead, integrated architecture for RESTful communication between applications and equipments. This architecture takes the form of a distributed operating system, hiding details of home area network and providing an access to the individual components via a RESTful interface. This distributed operating system runs on a master processor (which can be a box such as a Raspberry Pi for example) as well as on sensors, which can be as simple as TinyOS, Contiki, or Arduino nodes. The interconnection network between master and slave processors can be any layer 2 network (Ethernet, Wifi, 802.15.4, PLC, etc.). The system is designed for maximum simplicity, removing all unneeded protocols and components, therefore achieving higher reliability which is mandatory for such environments, yet delivering RESTful communication to the IPv4 and IPv6 worlds.

*Thomas Noel is professor in computer science at University of Strasbourg - France. He is the head of the computer science department in the ICube Laboratory (<http://icube.unistra.fr>). The main fields of application of ICube are engineering for health, the environment and sustainable development. Thomas Noel's research interests include Network Architectures, Wireless Sensor Networks, Internet of Things, Environmental and Wildlife Monitoring, Mobility in IP Networks, Low Power Algorithms.*

**Patrick Senac** Professor, ISAE

#### **On the emergence of temporal structures in dynamic networks: When the edge of the Internet becomes the core**

The continuously increasing set of processing, communication and storing resources that are populating the edge of the Internet make it possible to use the resources of this « mobile cloud » independently of the core network according to a « store-move and forward » communication paradigm. The efficient use of the communication capacity offered by this mobile cloud requires an understanding of the intrinsic structures of its underlying dynamic graph of interactions. However these structural properties are not well understood and explained yet. In this talk we will introduce and study some of these structural properties. Specifically, we address the problematic of the small world phenomenon in dynamic networks. After defining the salient features that characterize the small world structure in dynamic networks we show that this structure is intrinsic to a great diversity of dynamic networks traces. We introduce a parametric model that shows how this structure can emerge and we define a sufficient condition for the emergence of the small world phenomenon in a dynamic network. Then, we study the impact of this phenomenon on the capacity of a network to diffuse rapidly information among its nodes. Then impact of the order and regularity of contacts will be also introduced. Finally a simple and efficient routing algorithms adapted to these structural properties will be evoked.

*Patrick Senac is the head of the Mathematics, Computer Science and Control Theory Department of the Institut Supérieur de l'Aéronautique et de l'Espace (ISAE, University of Toulouse. Patrick Sénac is also the Director of the Research Group on Architectures, Systems and Networks of the CNRS. Patrick Sénac is professor of computer science at ISAE. Patrick Sénac graduated from the "Ecole Nationale Supérieure d'Ingénieurs d'Hydraulique d'Electrotechnique, d'Electronique et d'Informatique et Télécommunication" (ENSEEIH) in 1983 and received the Ph.D. degree in computer science in 1996 from Toulouse University, France. During 1991 he was invited researcher at the School of Electrical Engineering of University of California at Berkeley and during 2004 he was invited professor at the School of Electrical Engineering and Telecommunication of the University of New South Wales in Sydney, Australia. He has published more than 100 papers in international conferences and Journals, has co-edited the proceedings of several international conferences and is the co-author of two books on Petri Nets, one book on multimedia systems, one on pervasive networking and one on opportunistic mobile networks. His current research interests focus on the modeling and design of advanced architectures, protocols and mechanisms for pervasive and mobile networks, modeling and analyzing dynamic networks and routing in DTN.*

**Thomas Silverston** Assistant Professor, Université de Lorraine

#### **Popularity-based caching in Content-Centric Networks**

Information-Centric Networking (ICN) is expected to be at the core of the Future Internet. Indeed, users are only interested by content and there is a need to change the traditional "host-to-host" communication paradigm of the Internet to a "user-to-content" paradigm. Content Centric Networking (CCN) has recently emerged as a promising architecture. It is based on named-data where a packet address names content and not its location. Then, the premise is to cache content on the network nodes and an important feature for CCN is therefore the cache management. In this presentation, we will discuss about the caching strategies and present our new popularity-based caching strategies designed for CCN.

Thomas Silverston is an Associate Professor at University of Lorraine (Nancy) since 2011. Before, he received a PhD from UPMC (2009) and was a postdoc researcher (JSPS fellow) at the University of Tokyo and JFLI from 2009 to 2011. His research focuses on the Future Internet, and more precisely on content networking, P2P systems, network measurement and Information-Centric Network. He is a WIDE member since 2009 and he is the coordinator of the "City Crowd Source" activity of EIT ICT labs to provide new services for digital cities of the future.

**Nobuo Kawaguchi** Professor, Graduate School of Engineering, Nagoya University

#### **Crowdsourcing of Location based Information and OpenData Integration**

Internet and smartphone enable a new paradigm on Location based Information systems called "Crowdsourcing" or "Participatory sensing". In this talk, the experiences through the crowdsourced "locky" project are introduced. Our locky services are used by more than 2 million users in Japan. Integration with open-data and crowdsourced information enables cost-effective and sustainable information services.

*Prof. Nobuo Kawaguchi received the B.E, M.E and Ph.D. in Computer Science from Nagoya University, Japan, in 1990, 1992, and 1997 respectively. Since 2009, he has been a Professor of Department of Computational Science and Engineering, Graduate School of Engineering, Nagoya University. He developed a location based timetable information system named "TimeTable.Locky" as an iPhone Application. The series of the system was downloaded more than 2 million times. Prof. Nobuo Kawaguchi has his research interest in the areas of Human Activity Recognition, Location Based System and Ubiquitous Communication Systems. He is now serving a chair person of a NPO Location Information Service Research Agency(Lisra), Japan.*

**David Simplot-Ryl** Professor, Université Lille 1

#### **Back to the basics: Neighborhood discovery in mobile ad hoc networks**

In ad-hoc networks, most of protocols are based on knowledge of the so-called neighbors of the nodes. The neighborhood of a given node is the set of stations that can communicate with this node. The discovery of these neighbors is currently based of a "HELLO protocol" which sends a beacon at a given period. In this presentation, we will discuss about optimization of this family of protocols in order to obtain accurate neighborhood while minimizing energy consumption. In particular, we will study solutions where the frequency of the beacons is dynamically adapted to the topology of the network.

*David Simplot-Ryl is a professor in computer science at Université Lille 1 currently on leave at Inria where he is director of the Inria Lille - Nord Europe research centre. He was nominated as a member of the Institut Universitaire de France (IUF) in 2009 and was head of the Inria Pops project-team from 2004 to 2011. His research interests include sensor and mobile ad hoc networks, mobile and distributed computing, smart objects, and RFID technologies. He is involved in numerous international conferences (MASS 2010-2011, INFOCOM 2011-2014), and editorial activities (associate editor of TPDS and COMNET).*

**Ryutaro Kawamura** Director, Vice President, NTT Network Innovation Laboratories

#### **Requirements, expectations and controversies surrounding the future Internet**

The Internet is a key infrastructure for the global exchange of knowledge and communication, and its growth rate remains unprecedented. In this talk, I'd like to discuss several key technological and non-technological issues regarding the Internet of the future from the network service provider's viewpoints, including the requirements, expectations and controversies. For example, challenging the rapid increase in the volume of data traffic, how to promote the connection of real "things" to the Internet, and the dilemma between the ideal of networking and the nature of network technologies.

*In 1989 he joined Nippon Telegraph and Telephone Corporation's (NTT) Transport Systems Laboratories. From 1998-1999, he was a visiting researcher in Columbia University. From 2003 he has been a Board of Director of OSGi Alliance ([www.osgi.org](http://www.osgi.org)). He is engaged in research on network reliability techniques, network control and management, high-speed computer networks, network middleware, software component technologies, network service platform and the future Internet. Currently, he is a director and vice president in NTT Network Innovation Labs.*

**Guillaume Chelius** CEO, President, HIKOB

#### **Industrial Internet, Internet of Things, Big Data: Business Opportunities, Pure Players vs. Brick & Mortar**

"That which is measured improves. That which is measured and reported improves exponentially". Behind Pearson's law hides the promise of the second digital revolution of the 21st century. This revolution is generally described under the concepts of Smart Objects, Industrial Internet, Internet of Things (IoT) or Big Data / Data Analytics. However, contrary to the Information and Internet revolution, the dynamic behind this transformation is slow and hidden, mainly due to the segmented market of traditional industries. During this talk, we will try to analyse the reality of the Industrial Industry market, the construction of the value chain and the adequacy and pertinence of the developed technologies regarding the needs of on-field engineers.

*Guillaume Chelius obtained his Ph.D. from the INSA de Lyon engineering school in 2004 and joined the INRIA as a Research Scientist the same year. Between 2004 and 2010, he developed his research in the domains of Wireless Sensor Networks. He was also a visiting scientist in several laboratories (LNCC - Brasil, CTTC - Spain, LIP6 - France, Telecom ParisTech - France). In 2011, he cofounded HIKOB, a startup which aims at developing an integrated hardware and software engineering platform to speedup the penetration of IoT technologies in traditional industries. He is currently president and CEO of HIKOB.*

**Sachiko Yoshihama** Manager, Smarter Cities Solutions, IBM Research -- Tokyo

#### **Frugal Innovation for Smarter Transportations in Developing Countries**

Frugal Innovation is a process of designing and creating goods and services by reducing the complexity and cost to meet the needs and constraints in developing countries. The approach can also be applied to major systems to support solutions for challenges such as disaster response, traffic awareness, daily traffic control or city planning. This presentation will show an example of frugal innovation that IBM Research is pursuing in Nairobi, where its 12th Research Lab opened in 2012. Nairobi is the capital of Kenya, and is one of the largest cities in Africa with more than 3 million population and 300K vehicles. However, the city is suffering from serious traffic congestion due to growing urban population, as many other cities in developing countries. Unlike standard smarter cities solutions, we do not rely on expensive infrastructure, which is generally very hard to expect in developing countries. Our primary data source is roadside traffic cameras (i.e., WebCam) already available in Nairobi today. By using newly developed image recognition algorithms, our system allows to extracting traffic statistics (e.g., number of cars and speed) from very low-resolution web-camera images. Detected traffic condition is used to increase the traffic awareness of drivers and traffic police. In addition, by using a large-scale, multi-agent traffic simulator, city officers will now be able to evaluate various road construction plans and the drafts of traffic regulations to compare their effect to the traffic in advance and choose the best plan.

*Sachiko Yoshihama is leading the Smarter Cities Solutions team at IBM Research -- Tokyo. As part of 12 IBM Research Labs across the world, her team focuses on creating solutions for developing countries and to address unique challenges in the region such as scarcity of resources. She has 20 years of history in the IT industry and her research background includes mobile and pervasive computing as well as information security. She received her M.S. from Institute of Information Security and Ph.D in Information Security from Yokohama National University in Japan.*

**Vania Conan** Research Director, Thales Communications & Security

#### **User centric offloading – using terminal-to-terminal connections to offload congested radio access networks**

Mobile traffic surge (a 26-fold data increase is planned in the coming five years) calls for radically new traffic delivery mechanisms. We advocate a novel traffic offloading architecture that exploits terminal-to-terminal communication opportunities to offload traffic from the cellular radio access. This architecture exploits direct connections between terminals to support content delivery to crowds of users. The talk reviews the technical challenges posed by this approach, protocol design and performance targets as well as business opportunities for mobile operators.

*Vania Conan is a networking expert at Thales Communications & Security, in France. Over the past years his research has spanned wireless node architectures, opportunistic protocol design, cross-layer communication paradigms and middleware design for networked systems. His current focus is on the design of mobile radio networks and terminals exploiting opportunistic communications. He has published over 60 international conference and journal papers and filed several patents in networking technologies.*

**Kenjiro Cho** Research Director, Internet Initiative Japan, Inc.

#### **Panel: Challenges towards Future Society**

The panel session aims at discussing technical challenges for the Internet to enable people to build future information society. The Internet is and continues to be an enabling infrastructure that enables new protocols, new applications, new devices, new business, new life-style, and new social structures. However, how it evolves is hard to predict because evolutionary paths will vary, influenced by the dynamics of various factors such as technological development, business decisions by stakeholders, deregulations and other IT policies, and global competition. Thus, it is essential to the design of future Internet technologies to have economical and societal perspectives. The panel will start with a brief review of the future Internet research, followed by discussion on business and societal needs to examine the current research directions and broaden our views.

*Kenjiro Cho is Research Director at Internet Initiative Japan, Inc. He is also an adjunct professor at Keio University and Japan Advanced Institute of Science and Technology, and a board member of the WIDE project. His current research interests include Internet data analysis, cloud networking, and large-scale content distribution systems. He received the B.S. degree in electronic engineering from Kobe University, the M.Eng. degree in computer science from Cornell University, and the Ph.D. degree in media and governance from Keio University. He was with Canon, Inc. during 1984-1995, with Sony Computer Science Laboratories, Inc. during 1996-2004, and is with IJ since 2004.*

**Serge Fdida** Professor, UPMC Sorbonne Universités

#### **Internet for a healthy and assisted living?**

Nowadays, the Internet infrastructure is often seen as a commodity. Tons of objects and many robots will emerge to assist us by sensing and communicating with their direct environment. This situation should be perceived as a immense opportunity to develop the soft space that will challenge the expectations from the society including the industrial policy, energy, transport, ageing and many more. All will trigger tussles that are not bounded to technological concerns leading to an Internet science approach of the problems.

*Serge Fdida is a Professor with the Université Pierre et Marie Curie (UPMC) since 1995. He has been leading many research projects in High Performance Networking in France and Europe, notably pioneering the European activity on federated Internet testbeds and the associated FP6&7 projects ONELAB, ONELAB2 and OPENLAB. Currently, he is also leading the Equipex FIT, a large-scale testbed on the Future Internet of Things. Serge Fdida has also developed a strong experience related to innovation and industry transfer, - he was the Director of EURONETLAB, a joint laboratory established in 2001, together with Thales, - the co-founder of the Qosmos company, - one of the active contributor to the creation of the Cap Digital cluster. Serge Fdida has published many scientific papers and books, and is a Distinguished ACM Member. Serge Fdida has also a long experience of research management. From 2000*

to December 2005, he was appointed scientific adviser with CNRS-STIC. In addition, he has been the Vice-President of the RNRT. More recently, has been appointed Vice-President in charge of International Affairs at UPMC from 9/2011 to 12/2011 and is now VP in charge of Europe.

**Jun Murai** Dean and Professor, Faculty of Environment and Information Studies, Keio University

### Strategies of 2013

The Internet: In the past few years, the role of the Internet has been discussed in somewhat different ways than the previous decades. First of all, the serious discussion toward access of the Internet becoming one of the 'human right' can lead to a new design goal of the technology. The nature of the Internet is to provide truly global space to human being, which has been achieved in a sense, but there still remains a long way in terms of scaling and traffic management. The accurate time and location information has been added to the cyber space data. This achieved the convergence of the cyber space on the Internet and the physical space with the Internet. Now, we need very interesting design efforts for the future of the distributed processing system called the Internet by these aspects of the grand convergence of the global space covering the entire planet, with precise concepts of accurate time, location and human life. This new design strategy of the Internet in 2013 would be discussed.

*Jun Murai is Dean and Professor of Faculty of Environment and Information Studies at Keio University, and the Founder of the WIDE Project. Jun Murai is an expert in Computer Communications and Operating Systems, and has been playing invaluable roles in the Internet community over the last 3 decades. He established the first UNIX-based academic network in Japan, JUNET, in 1984, and the WIDE Project in 1988 to launch the first TCP/IP network in the Asia-Pacific region. He has been advising national governments and global IT policy communities. Jun Murai graduated from Keio University in 1979, and holds MS (1981) and Ph.D. (1987) in Computer Science from Keio University. He served as Internet Architecture Board (IAB) in 1993-1995, Board of trustee of Internet Society (ISOC) in 1997-2000, and Board of Director of the Internet Corporation for Assigned Names and Numbers (ICANN) in 1998-2003. His major awards include Jonathan B. Postel Award from ISOC in 2005, Funai Achievement Award in 2007, IEEE Internet Award in 2011, and the Okawa Prize in 2012.*

**Shinji Shimojo** NICT/Osaka University

### How does Future Internet change our life? Examples from JGN-X

Future Internet (FI) has been a research topics for few years. However, the area of research on FI is so diverse and it is difficult to explain how these technologies are applied. To fill the gap between technology development and its application, we are operating network testbed called JGN-X for FI. JGN-X has been used for many research and development on FI. But most of experiments were performed on the backbone. Although one of the expecting area of application of FI is on the wireless communication and sensor network, we could not have such testbed in reality. Here we introduce our effort to bring a new kind of testbed in Tohoku area and North district of Osaka Station, which adopt SDN, wireless network and sensor network.

*Shinji Shimojo is a professor at Cybermedia Center and a director of network testbed research and development promotion center, NICT. He is running national network testbed called JGN-X which is used for R&D of Future Internet. He is involved in building a science park in the downtown Osaka which is called Knowledge Capital and is recently open.*

**Takeshi Natsuno** Director, Dwango Co, Ltd / Guest Professor, Graduate School of Media and Governance, Keio University

*Takeshi Natsuno is a Guest Professor at Keio University, and a board of directors of IT companies including Dwango, Sega Sammy Holdings, SBI Holdings, Pia, Transcosmos, and GREE. He is also an advisory board member of World Wide Web Consortium (W3C). He graduated from Waseda University in political science and economics in 1988, and received his MBA from the Wharton School of Business, Pennsylvania University in 1995. He was a Senior Vice President of NTT DoCoMo until 2008.*

**Kavé Salamatian** Professor, Université de Savoie

### Can we talk about Future Society without an Internet Science?

Internet is nowadays a reality experienced daily by billions of human beings. This network that has evolved in 40 years from a small experiment involving 4 nodes into a web crossing continents, and connecting hundreds of millions of servers and routers, concretizing the cyberspace "consensual hallucination" prophesized by William Gibson in 1982. However, Internet was not the first and most important network that has impacted humanity. Current humanity is resulting from the large network of migration, transferring DNAs, that has lead Lucy's cousins, the Australopithecus afarensis, to come out of Africa and spread into the world. The remainder of human history has largely been shaped by different networks: networks of roads, financial, social, families, etc. Network are therefore playing a central role in the development of human societies and one has to understand them their properties in order to have a grab of the Future Society. Internet Science is an emerging multidisciplinary emerging science that combines expertise ranging from humanities, sociology, economics, psychology to computer science, physics and mathematics. The aim of this science is to understand the fundamental concepts of Internet and other network and to provide keys in understanding the past and future evolution of Internet. I will give a broad description of this science and present the European Network of Excellence on Internet Science (EINS).

*Kavé Salamatian is a full professor at University of Savoie. His main areas of researches are Internet measurement and modeling, and networking information theory. He was previously reader at Lancaster University, UK and associate professor at University Pierre et Marie Curie. Kavé has graduated in 1998 from Paris SUD-Orsay university where he worked on joint source channel coding applied to multimedia transmission over Internet for his Phd. In a former life, he graduated with a MBA, and worked on market floor as a risk analyst and enjoyed being an urban traffic modeler for some years. He is working these day on figuring out if networking is a science or just a hobby and if it is a science what are its fundamentals. He has been TPC chair of the first Internet Science Conference in April 2013.*