Program

Keynote 1

Reviewing and foreseeing recent IT technology trends; Expanding the concept of Internet to IoT, AI, and blockchain.

Since 1990s, the speaker has been involved in introducing advanced IT technologies to the real use cases in the front line of business. This keynote reviews technology trends of these 20 years from Internet and IPv6 to the most recent ones such as IoT, AI and blockchain which the speaker now deals with in Intec Inc., and tries to forecast the future deployment of these technologies. He started up an Internet service in a Japanese telecom carrier, NTT, as a chief network engineer, which is now the biggest Internet service provider in Japan. Different from traditional telecom services, the Internet is open in terms of technology, business and community. Thanks to openness, the Internet has been a platform to make and accelerate a lot of innovations. Technology openness leads to easier connections within contents, software and people as well as less costly services. Community openness helps more collaboration of stakeholders. Business openness invites thousands-times more people to "innovation games". The speaker believes recent IT technologies stated above are just on the same path the Internet has evolved and will accelerate much more innovations than the Internet did.

S1: Sensing

Approaching Vehicle Detection Method with Acoustic Analysis using Smartphone for Elderly Bicycle Driver
Shogo Kawanaka and Yukitoshi Kashimoto (Nara Institute of Science and Technology, Japan); Aryan Firouzian (University of Oulu, Finland); Yutaka Arakawa (Nara Institute of Science and Technology & NAIST, Japan); Keiichi Yasumoto (Nara Institute of Science and Technology, Japan); Petri Pulli (University of Oulu, Finland)

Implementation and Evaluation of Child’s Location History Transportation Device for Potentially Dangerous Area Detection
Kazunori Omura, Hiroyuki Nonomura, Katsuhito Naito, Tadanori Mizuno and Katsuhiko Kaji (Aichi Institute of Technology, Japan)

Evaluating the Spatio-temporal Coverage of Automotive Sensing for Smart Cities
Yin Chen, Takuro Yonezawa, Jin Nakazawa and Hideyuki Tokuda (Keio University, Japan)

Urban Dust Monitoring From Ground Level to Last Floor
Renato Ferrero, Filippo Gandino, Masoud Hemmatpour, Bartolomeo Montrucchio and Maurizio Rebudengo (Politecnico di Torino, Italy)

Discussions on Congestion Control with Network Coding for Switches in Campus Networks
Satoru Ono (Shizuoka University, Japan); Masaki Bandai (Sophia University, Japan); Takashi Watanabe (Osaka University, Japan)

S2: Location

Accuracy Improvement in Sensor Localization System utilizing Heterogeneous Wireless Technologies
Takahiro Yamamoto, Shigemi Ishida and Kousaku Izumi (Kyushu University, Japan); Shigeaki Tagashira (Kansai University, Japan); Akira Fukuda (Kyushu University, Japan)

Analysis of Random Geometric Graph for Wireless Network Configuration
Renato Ferrero and Filippo Gandino (Politecnico di Torino, Italy)

A Three-Dimensional Smartphone Positioning Method using a Spinning Magnet Marker
Kosuke Watanabe and Kei Hiroi (Nagoya University, Japan); Takeshi Kiamiya, Sano Hiroyuki and Masakatsu Tsukamoto (NTT DOCOMO, Inc., Japan); Masaji Katagiri (NTT DOCOMO, INC., Japan); Daizo Ikeda (NTT DOCOMO, INC., Urban Sensing Research Group, Research Laboratories, Japan); Katsuhiko Kaji (Aichi Institute of Technology, Japan); Nobuo Kawaguchi (Nagoya University, Japan)

A Notification Environment Using User-Installed Beacons
Shuhei Hashimoto (Ritsumeikan University & Graduate School of Information Science and
Poster and Demo

**CICS/PUI: Color-lighting and Illuminance Control System using Paper UI**  
Tomoki Okuro, Hiroto Aida, Daisuke Yamashita, Shuhei Morimura and Mitunori Miki (Doshisha University, Japan)

**Recording Daily Life Food Intake Using Intra-body Communication Technology**  
Yuichi Mitsudo (Institute of Systems, Information Technologies and Nanotechnologies, Japan)

**An automatic training system against Advanced Persistent Threat**  
Kazuki Iwata (Graduate School of Future University Hakodate, Japan); Yoshitaka Nakamura, Hiroshi Inamura and Osamu Takahashi (Future University Hakodate, Japan)

**An indoor location estimation using BLE beacons considering movable obstructions**  
Hisashi Hoshi (KDDI Research, Inc., Japan); Hiroki Ishizuka (KDDI Labs, Japan); Arei Kobayashi (KDDI R&D Laboratories Inc., Japan); Atsunori Minamikawa (KDDI R&D Laboratories, Inc., Japan)

**Detection of Half-turn Stairs from Walking Trajectories Estimated by Pedestrian Dead Reckoning**  
Kosuke Yotsuya and Haruka Iwase (Aichi Institute of Technology, Japan); Nobuyuki Ito (Mitsubishi Electronic Engineering Co. Ltd., Japan); Katsuhiko Naito, Naoya Chujo, Tadanori Mizuno and Katsuhiko Kaji (Aichi Institute of Technology, Japan)

**Cloud-based UAV Data Delivery over 4G Network**  
Yujie Zhang and Zhenhui Yuan (Hangzhou Dianzi University, P.R. China)

**A Japanese Input Method Using Leap Motion in Virtual Reality**  
Kosuke Komiya and Tatsuo Nakajima (Waseda University, Japan)

**Development of an End-to-End Communication Adapter and Implementation**  
Fumiya Ogry and Hidekazu Suzuki (Meijo University, Japan); Katsuhiro Naito (Aichi Institute of Technology, Japan); Akira Watanabe (Meijo University, Japan)

**Realization and Evaluation of Java Wrapper That Calls the End-to-End Communication Library**  
Kazuki Shimizu and Hidekazu Suzuki (Meijo University, Japan); Katsuhiro Naito (Aichi Institute of Technology, Japan); Akira Watanabe (Meijo University, Japan)

**Recognizing Whether a Person is Eating Alone or Has Company by Using Wearable Devices**  
Kazuki Kiriu (University of Tokyo, Japan); Keiichi Ochiai, Aiki Inagaki and Naoki Yamamoto (NTT DOCOMO, Japan); Yusuke Fukazawa (NTT DOCOMO, Inc., Japan); Masatoshi Kimoto (NTT DOCOMO, Japan); Tsukasa Okimura, Yuri Terasawa and Takaki Maeda (Keio University, Japan); Jun Ota (The University of Tokyo, Japan)

**The Effectiveness of Virtual Learning Environment for Higher Education Learners in ASEAN Community**  
Nutthakorn Songkram (King Mongkut's Institute of Technology Ladkrabang, Thailand); Noawanit Songkram (Chulalongkorn University, Thailand)

**Children's Observation System Using Information Terminal Bus Stop**  
Taku Kurbayashi (Kanazawa Institute of Technology, Japan); Ryotaro Hirazakura (KIT, Japan); Mikiko Sode Tanaka (Kanazawa technical collage, Japan); Yosuke Miyahishi Miyanishi (KIT, Japan); Shoki Tomizawa and Masashi Saito (Kanazawa Institute of Technology, Japan)

**Play Recognition Using Spatio-Temporal Relationship of Football Tracking Data**  
Tomoki Imai and Akira Uchiyama (Graduate School of Information Science and Technology, Osaka University); Takuya Magome (Graduate School of Medicine, Osaka University, Japan); Teruo Higashino (Graduate School of Information Science and Technology, Osaka University)

**Proposal on Application Layer Multicast, Based on a Ring Shaped Route**  
Ryoichi Suganuma and Hidekazu Suzuki (Meijo University, Japan); Katsuhiro Naito (Aichi Institute of Technology, Japan); Akira Watanabe (Meijo University, Japan)
**Keynote 2**

Cyber-Physical-Social Convergence in Smart Living: Challenges and Opportunities

We live in an era in which our physical and personal environments are becoming increasingly intertwined and smarter due to the advent of pervasive sensing, wireless communications, computing, and actuation capabilities. Indeed, our daily lives in smart cities and connected communities depend upon a wide variety of smart service systems and cyber-physical infrastructures, such as smart energy, transportation, healthcare, supply-chain, etc. Alongside, the availability of low-cost wireless sensor networks (WSNs), Internet of Things (IoTs), and rich mobile devices (e.g., smartphones) are also empowering humans with fine-grained information and opinion collection through crowdsensing about events of interest, thus resulting in actionable inferences and decisions. This synergy has led to cyber-physical-social convergence with human in the loop that exhibits complex interactions, inter-dependencies and adaptations between engineered/natural systems and users with a goal to improve quality of life experience what we call smart living. However, the main challenges are posed by the scale, heterogeneity, big data, and resource limitations (e.g., energy) in context recognition and situation awareness using sensors, IoTs and CPS networks. This talk will highlight unique research issues and challenges in smart living and CPS systems, followed by novel solutions for energy-efficient data gathering and fusion, lifetime optimization and security in WSNs, and trade-off between energy and information quality in multi-modal context recognition. Our research is based on online and randomized algorithms, graph theory, game theory, trust model, and information theory. Case studies and experimental results will be presented for energy efficient homes and smart healthcare applications. The talk will be concluded with directions for future research.

**S3: Security**

*Post-Quantum Authentication in OpenSSL with Hash-Based Signatures*
Denis Butin, Julian Wälle and Johannes Buchmann (TU Darmstadt, Germany)

*Mixed Public and Secret-key Cryptography for Wireless Sensor Networks*
Mattia Gritti, Filippo Gandino and Maurizio Rebaudengo (Politecnico di Torino, Italy)

*Privacy-preserving and Fine-grained Data Aggregation Framework for Crowdsourcing*
Gaoqiang Zhuo (Binghamton University, USA)

*An Alternative Approach to Blockchain Mining Work for Making Blockchain Technologies Fit to Ubiquitous and Mobile Computing Environments*
Yuki Kano and Tatsuo Nakajima (Waseda University, Japan)

**S4: Communication**

*Design and Implementation of a Wireless Network Tap Device for IEEE 802.11 Wireless Network Emulation*
Arata Kato (Shizuoka University, Japan); Mineo Takai (University of California, Los Angeles & Osaka University, USA); Susumu Ishihara (Shizuoka University, Japan)

*Reliable Wireless Communications in Battery Management System of Electric Vehicles*
Tadahide Kunitachi (Osaka University & YAZAKI Corporation, Japan); Kazuhiko Kinoshita (Tokushima University, Japan); Takashi Watanabe (Osaka University, Japan)

*IP Mobility Enhancements for MIPv6 and PMIPv6*
Rui Meng (Huawei, P.R. China); Bin Da (Beijing Huawei Digital Technologies Co., Ltd., P.R. China); Chuang Wang (Huawei Corporation, P.R. China)

*ACRA: Adaptive Clustering Resource Allocation for Vehicle to Vehicle Communications*
Cheng-Yu Chen, Cheng-Sen Huang and Jen-Yeu Chen (National Dong Hwa University, Taiwan)

**S5: Recognition**

*Utilizing Mobile Devices for Evaluating Body Trunk Coordination: Feasibility and Preliminary Results*
Zilu Liang (The University of Tokyo & National Institute of Advanced Industrial Science and Technology, Japan); Takuichi Nishimura, Nami Iino, Satoshi Nishimura and Yasuyuki Yoshida (National Institute of Advanced Industrial Science and Technology, Japan)
**S6: Social**

**Evaluating Effects of Information Sharing Interface Utilizing Utterance on Co-located Collaborative Search**  
Takatsugu Yamamoto, Takehiro Koretsune, Jo Imamoto and Hideyuki Takada (Ritsumeikan University, Japan)

**Estimating Customer Preference through Store Check-in Histories and its Use in Visitor Promotion**  
Chiaki Doi, Masaji Katagiri and Akira Ishii (NTT DOCOMO, INC., Japan); Teppei Konishi (NTT DOCOMO, Inc., Japan); Takashi Araki and Ken Ohta (NTT DOCOMO, INC., Japan); Hiroshi Inamura (Future University Hakodate, Japan); Hiroshi Shigeno (Keio University, Japan)

**A Broadcast Distribution System for Deliver Emergency Bulletins to User Equipments of Outside eNBs Coverage**  
Yutaka Musaka, Yoshitaka Nakamura and Hiroshi Inamura (Future University Hakodate, Japan)

**Virtual Smart Classroom to Enhance 21st Century Skills in Learning and Innovation for Higher Education Learners**  
Noawanit Songkram (Chulalongkorn University, Thailand)

**A Mobile Based Emergency Reporting Application for the Philippine National Police Emergency Hotline 911: A Case for the Development of i911**  
Shallom Edillo, Pamela Judith Garrote, Lucky Celyn Domingo, Arianne Malapit and Bernie S Fabito (National University, Philippines)

**S7: Application**

**DeepRemote: A Smart Remote Controller for Intuitive Control through Home Appliances Recognition by Deep Learning**  
Yuta Takahashi, Naoki Shirakura, Kenta Toyoshima, Takuro Amako, Ryota Isobe, Jun Takamatsu and Keiichi Yasumoto (Nara Institute of Science and Technology, Japan)

**Clash Tanks: An Investigation of Virtual and Augmented Reality Gaming Experience**  
Shubhankar Ranade, Mingshu Zhang, Mohammed Al-sada, Jaryd Urbani and Tatsuo Nakajima (Waseda University, Japan)

**Compression Method for ECU Software Updates**  
Yutaka Onuma (Graduate School of Kanagawa Institute of Technology, Japan); Sumika Nakamura (Kanagawa Institute of Technology, Japan); Yoshiaki Terashima (Soka University, Japan); Ryozo Kiyohara (Kanagawa Institute of Technology, Japan)