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Message from editor

Dear ECTI Association members

In the end of the year, many members might be busy in processing of this year tasks. People normally try to learn faults in this year, and expect to improve them in the New Year. The e-magazine also has to be improved, and we are going to absolutely change to the international e-magazine in the next year.

In the ECTI e-magazine issue of volume 7, number 4, you may read an article entitled "Human-Machine Communication: State-of-the-Art Technologies" written by Dr.Montri Pothisonothai and Prof. Katsumi Watanabe (University of Tokyo), enjoy reports from APSIPA 2013 and ISPACS 2013, check paper list of ECTI-CIT Trans, Vol. 7, No. 2, and set up plans to submit papers by call-for-papers of APSIPA 2014 and ITC-CSCC 2014.

The cold season of winter approaches now. Please take care your health, and hope to see you again in the next issues.

ECTI E-Magazine Editor

Kosin Chamnongthai (King Mongkut's University of Technology Thonburi: KMUTT, Thailand)

In this issue:

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ECTI President Message:

The last issue of the year always has a special meaning for me. Mostly, it signifies the job well done for another year, and indeed this is a hard work. I would like to congratulate editorial boards who put tremendous effort into getting newsletter to us. I also must thank all our members in supporting our association, without all of you we cannot progress.

The end of year also gives us festive mood. It is the time of the year that we feel wanting to celebrate. Our King Birthday is coming and we are going through another happy year. With respect to technology advancement, Thailand did get to 3G this year and also the world has changed to post PC era where mobile and wireless computer sale has surpass traditional PC sale and number of smartphone has reached a tipping point to overtook ordinary cellphone. So, we live in a great technological revolution but at the same time the world has changed into great conflict politically. In this complex world, we need to be aware of our bias and we should be careful to exercise judgment over different people, different cultures.

I hope humanity will move forward, live happily and work hard make peace.

Prabhas Chongstitvatana (Chulalongkorn University)

ECTI Transactions on Communication Engineering, Vol. 7, No. 4, October-December 2013

In Human-Machine Communication*: State-of-the-Art Technologies

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Research Center for Advanced Science and Technology (RCAST),

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Abstract

Due to the recent progress towards development of communication technology, the state-of-the-art technologies of digital communication age, information/multimedia age, and human-machine communication age were presented. Based on today's communication technology, we effectively utilize physiological signal transmission as a real-time monitoring via wireless network and the Internet, e.g., the use of real-time physiologically based analysis, human-machine interaction, body area network, and telemedicine. Moreover, we provided an overview of the interdisciplinary scientific study to investigate human brain, i.e., cognitive science, and related research literatures.

Keywords: human-machine communication, information processing, physiological signal processing, body area network, telemedicine, cognitive science

1. Digital Communication Age

After the publication of the paper in 1948 "A Mathematical Theory of Communication" by C.E. Shannon [1], his contribution showed how information could be quantified with absolute precision, demonstrated the essential unity of all information media, and proved that every mode of communication could be encoded in bits. This paper provided a "blueprint for the digital age" for the modern digital communication technology. There were two major contributions from his paper [2], i.e., the first one is the development of the fundamental theoretical limits on the achievable performance that we still use it as ideal when communicating given information source over a given communication channel using coding schemes. The second object is the development of coding schemes providing reasonably good performance to keep information and to achieve reliable information transfer ideally while sending through noisy channel. The following advances, in coding theory, are a low-density parity-check (LDPC) codes [3], turbo codes [4], and polar codes [5].

* In the context of this paper, "Human-Machine Communication" is the system, methodology, or use of a variety of other methods to process and/or record from the human physiological signals.

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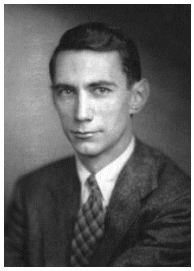

Figure 1 Claude Elwood Shannon (1916 – 2001) known as “the father of information theory”.

The channel access methods of modern digital communication have been developed consecutively since in the middle 90s, i.e., time division multiple access (TDMA), code division multiple access (CDMA), and high speed package access (HSPA). Nowadays, cellular communication systems are now evolving to 4G technology based on orthogonal frequency-division multiple access (OFDMA) and multiple-input multiple-output (MIMO), with the goal of achieving data rates beyond 100 Mbps as shown in Fig. 2. The latest technology migration is an upgrade from 3G to 3.5G networks based on HSDPA and high-speed uplink packet access (HSUPA) [6]. Based on the current data speed rate, it allows us sending and receiving a set of digital formats over bandwidth- or latency-constrained communication.

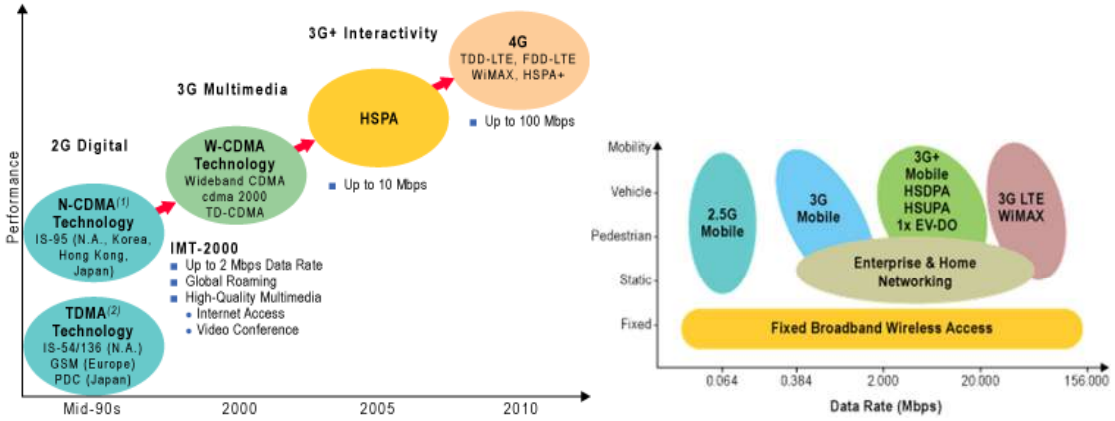

Figure 2 Evolution of digital communication. [6]

2. Information/Multimedia Age

We are currently now in the age of information technology in which many applications become applicable together with the advancement in semiconductor and computer software design,

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e.g., applications on smartphone, tablet, and other smart electronic devices. There has been linking such devices as an embedded network via wireless-based communication where provides more intelligent interaction. In Fig. 3 shows an essential key "information processing" which is the same as human perceptions performed outer information, e.g., speech, image, and video.

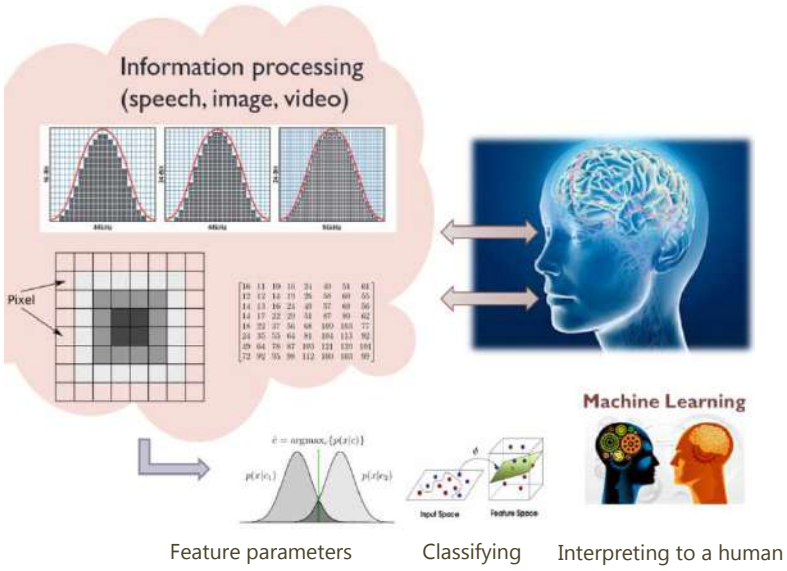

Figure 3 Human perception based information processing as machine learning.

In particular, all information must be transformed into a digital domain by using analog-to-digital conversion. The information processing can be realized in terms of mathematical model from basic to advanced theory. Basic principle consists of feature extraction and classification in interpreting results to a human. Up to date, the example of commercial products in the information/multimedia age that we can use as follows:

- *Google Translate*: this online service supports more than 70 languages worldwide. In Fig. 4, there are three optional ways for entering text on Google's Android operating system are that: 1) voice recognition via microphone based on automatic speech recognition (ASR) and speech-to-text technology, 2) image capturing via camera based on optical character recognition (or called OCR engine), and 3) online handwriting via touchscreen which is very useful for writing Chinese, Japanese or Korean characters.

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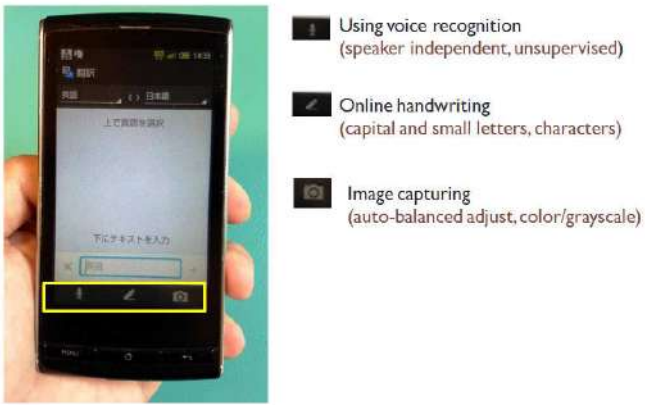

Figure 4 Three optional ways for entering text on Google's Android operating system.

- *YouTube Auto-Captions*: automatic caption mode is ready to launch in which we can watch video in over 12 different languages. This uses ASR software to generate captions automatically for certain YouTube videos. For the results, it is inaccuracy due to the feature is a beta version (in 2013). However, this feature allows user to edit auto-captions after they have been created. Moreover, deaf or hearing-impaired viewers can follow what is going on [7].

- *Apple Siri*: a voice-driven personal assistant application for the operating system iOS. The application uses natural language processing (NLP) to answer questions and make recommendations which is focused on artificial intelligence (AI) applications using voice to send messages, make calls, set reminders, and more. Siri has been an integral part of iOS since iOS 5. The latest iOS 6 supported the following languages: English, French, German, Japanese, Spanish, Italian, Korean, Mandarin, and Cantonese [8].

- *Facebook*: online social networking service introduced a semi-automating the user photo-tagging process based on facial recognition and detection technology when uploading photo.

- *Microsoft's Kinect*: Microsoft introduced a whole new way to play games without a controller when it launched Kinect a motion sensing input device. The device features an RGB camera, depth sensor and multi-array microphone, which provide full-body 3D motion capture, facial recognition and voice recognition capabilities. By using OpenNI an open source software development kit (SDK), the Artec Welcome app [9] introduces a revolutionary 3D face recognition technology as a password that protects computer from unauthorized access and turns it into a highly secured device as shown in Fig. 5.

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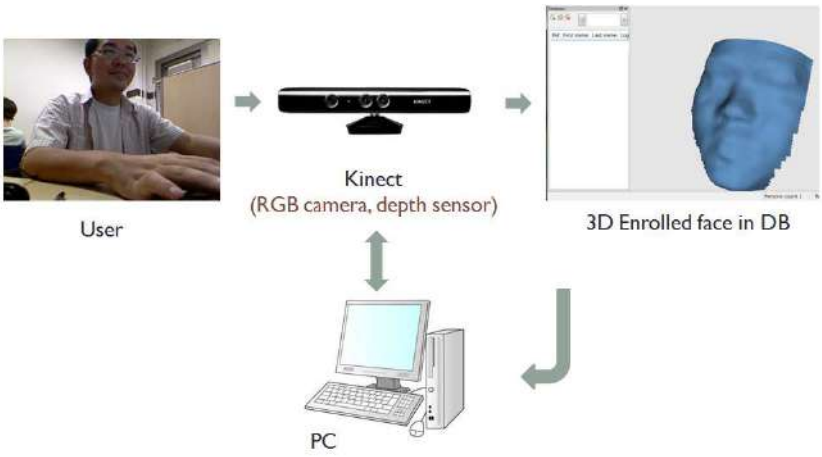

Figure 5 3D face recognition as password by using Kinect.

3. Human-Machine Communication Age

The future age, human-machine communication, all secrete things are created by the center of the nervous system called “brain” how this enormous neural edifice gives rise to subjective feelings is one of the greatest mysteries of science and philosophy [10]. This inspires an imitation of human mind by human cognitive-like robot that could express cognitive skill, emotion, feeling, or consciousness without being explicitly programmed.

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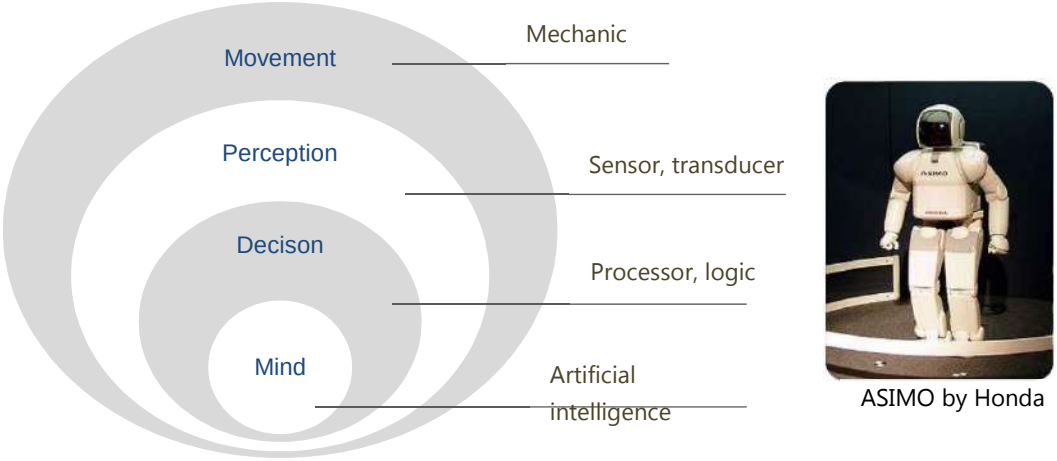

Figure 6 Human mechanism inspired the preliminary research in humanoid robot.

3.1 Brain-based cognitive science research

In order to understand human mind and its process in terms scientific study, “cognitive science” is the interdisciplinary based on the following major fields: psychology, computer science (AI), neuroscience, anthropology, philosophy, and linguistics, which contributed to the basic research and applied research. It includes research on intelligence and behavior, especially focusing on how information is represented, processed, and transformed (in faculties such as perception, language, memory, reasoning, and emotion) within nervous systems (human or other animal) and machines (e.g. computers) [11]. Economist Herbert Simon and Allen Newell studied human problem-solving skills and attempted to formalize them, and their work laid the foundations of the field of artificial intelligence, as well as cognitive science, operations research and management science. Their research team used the results of psychological experiments to develop programs that simulate the techniques that people used to solve problems [12]. At the Research Center for Advanced Science and Technology (RCAST), the University of Tokyo, Japan, cognitive science laboratory focuses on perception, cognition, and action. The main themes include: (1) scientific investigations on explicit and implicit processes in human perception, cognition and action, (2) interdisciplinary approaches to cognitive science, and (3) real-life applications of knowledge of cognitive science. [13]

3.2 Interfacing through Physiological Signal

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The physiological signals are becoming one of the most important information in various fields, e.g., biomedical engineering, computer science, telecommunication, psychology, education, mathematics, physics, and neuroscience; these fields require an interdisciplinary research which could provide us the novel knowledge to understand human in terms of "biomarker". There are different approaches, feasibility, sensing the physiological signal, and its applications such as:

- Electromyography (EMG): electrical impulses of the muscles
- Electroencephalography (EEG): electrical activities of the brain
- Magnetoencephalography (MEG): magnetic field of the brain
- EMG-based Human-Machine Interface System
- Bicep Muscle in Rehabilitation
- Artificial/Bionic limbs
- Brain-Machine/Computer Interface (BMI, BCI)
- Biofeedback
- Child Mental Development
- Brain Connectivity Analysis in Patients

Figure 7 Electrical impulses from the brain to a motor nerve control bionic limbs. [14][15]

Figure 8 Brain activity monitoring techniques for BCI. [16]

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3.3 Telemedicine platform

Body area network (BAN), is a wireless network of wearable computing devices. Initial applications of BANs are expected to appear primarily in the healthcare domain, especially for continuous monitoring and logging vital parameters of patients suffering from chronic diseases such as diabetes, asthma and heart attacks. A BAN network on a diabetic patient could auto injects insulin through a pump, as soon as their insulin level declines. Other applications of this technology include sports, military, or security. Extending the technology to new areas could also assist communication by seamless exchanges of information between individuals, or between individual and machines [17]. This relies on the feasibility of implanting very small biosensors inside the human body, e.g., bainwave, vision, hearing, heart signal, blood pressure, glucose, DNA protein, toxins, implants, and positioning, that are comfortable to collect various physiological changes as shown in Figs. 9 to 11. The information will be transmitted wirelessly to an external processing unit. The final goal of BAN is to improve quality of life as “anytime, anywhere” individual’s health and wellness monitoring.

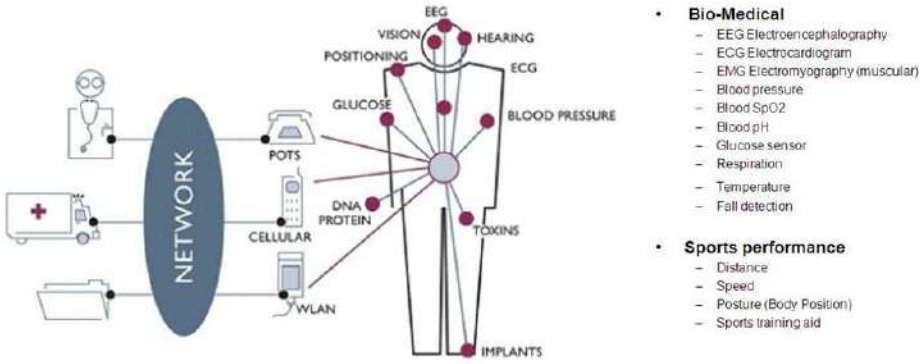

Fig.9 Basic structure for BAN. [18]

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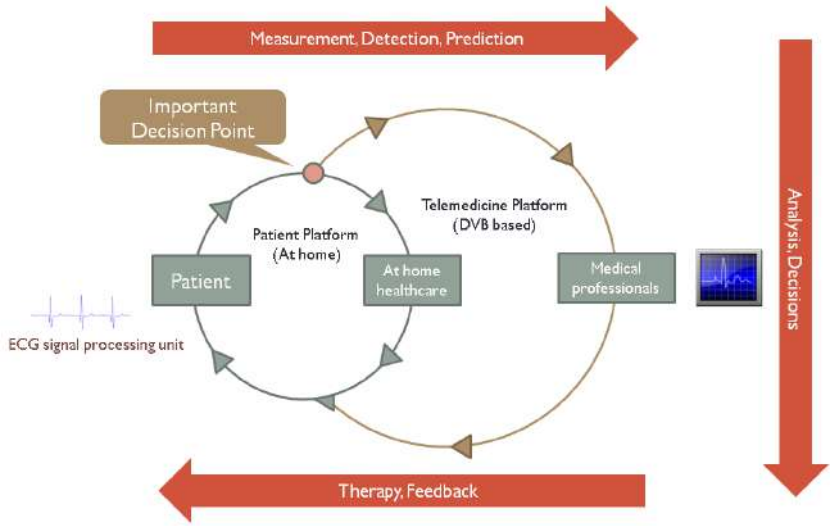

Figure 10 Closed-loop management approaches for wireless BAN (WBAN) in medical application. [19]

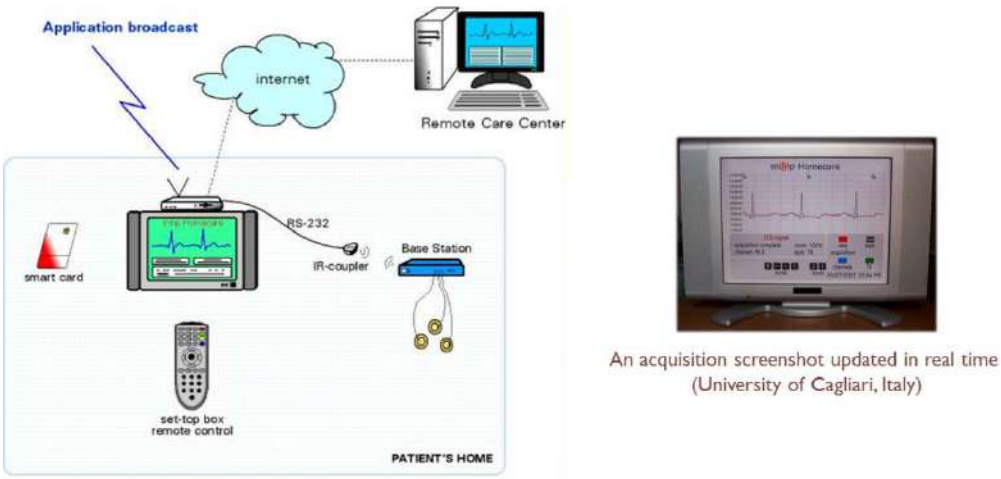

Figure 11 Development of a DVB-T based telemedicine platform. [20]

Conclusions and Future Directions

Digital communication technology has been introduced by major contribution from Shannon, also the channel capacity and possible coding scheme over noisy channel. Based on the current generation of mobile telecommunications technology, we are in the age of information/multimedia while trying to improve data speed rates beyond 100 Mbps. For the future prospects, we are moving to the age of human-machine communication technology and related to the interdisciplinary scientific

study to investigate human brain and physiological signal based applications, e.g., human-machine interaction, body area network, and telemedicine.

Take a map of any major university and interdisciplinary from research labs and medical centers into schools of law and business and departments of economics and philosophy. This conducts research and education in a variety of advanced science and technology. In recent years, neuroscience has merged with a host of other new areas in exploring neural pathways that underlie brain function and behavior, e.g., "neuroeducation, neurolaw, neuroeconomics, neurophilosophy, neuromarketing and neurofinance" [10].

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Montri Phothisonothai received his Ph.D. in Information Science and Control Engineering, Nagaoka University of Technology (Japan), in 2008, for his work in brain-computer interface. During 2008-2011, he was a lecturer at the Electrical Engineering Department and College of Cognitive Science, Burapha University, Thailand, where he designed an Event-Related Potential (ERP) the first and only experimental room in Thailand. Currently, he has been working as research fellow supported by the Japan Society for the Promotion of Science (JSPS) at the University of Tokyo, Japan. His research interests include: physiological signal processing (e.g. ERP, EEG, MEG, fMRI), speech and image processing, information processing, chaos and fractals in engineering, and computational neuroscience.

Kastumi Watanabe is Associate Professor of Cognitive Science at the University of Tokyo. He received his Ph.D. in Computation and Neural Systems, California Institute of Technology (USA), in 2001, for his work in cross-modal interaction in humans. He was a research fellow at the National Institute of Health (USA) and a researcher at the National Institute of Advanced Science and Technology (Japan). His research interests include: scientific investigations of explicit and implicit processes, interdisciplinary approaches to cognitive science, and real-life applications of cognitive science.

Paper List of ECTI-CIT Trans., Vol. 7, No. 2, Nov-2013 issue

(ttp://www.ecti-thailand.org/paper/journal_viewlist/56)

1. Darun Kesrarat, Vorapoj Patanavijit, “Experimental Analysis of Performance Comparison on Both Linear Filter and Bidirectional Confidential Technique for Spatial Domain Optical Flow Algorithm”
2. Meghna Pandharipande, Sunil Kumar Kopparapu, “A Language Independent Approach to Identify Problematic Conversations in Call Centers”
3. Takuya Matsuo, Naoki Kodera, Norishige Fukushima, and Yutaka Ishibashi, “Depth Map Refinement Using Reliability Based Joint Trilateral Filter”
4. Wisarn Patchoo, Thomas R. Fischer, “Block-Adaptive Lattice Vector Quantization in Image Coding”
5. Maulahikmah Galinium, Negar Shahbaz, “Case Studies: Business and Technical Perspectives in Migration of Legacy Systems to Service Oriented Architecture”
6. Kanabadee Srisomboon, Supap Srisaiprai, Preecha Thongdit, Wilaiporn Lee, Vorapoj Pattanavijit, “A performance comparison of two PWS filters in different domain for image reconstruction technique under different image types”
7. Masaaki FUJIYOSHI, “Blind Scheme with Histogram Peak Estimation for Histogram Modification-Based Lossless Information Embedding”
8. Gemalyn Dacillo Abrajano, Minoru Okada, “Rainfall field reconstruction using rain attenuation of microwave mesh networks”
9. Gemalyn Dacillo Abrajano, Minoru Okada, “A Novel Application to Image Restoration Based on Regularized SL0 Algorithm in Frequency Domain”
10. Krittameth Teachasrisaksakul, Surapa Thiemjarus, Chantri Polprasert, “A Bayesian Approach for Sound Source Estimation”

Kosin Chamnongthai (King Mongkut’s University of Technology Thonburi: KMUTT)

Assoc editor of ECTI-CIT Trans

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Asia-Pacific Signal and Information Processing Association

Annual Summit and Conference 2013

APSIPA ASC 2013, the 5th annual conference organized by Asia-Pacific Signal and Information Processing Association (APSIPA) was held in 85 Sky Tower Hotel, Kaohsiung, Taiwan, from October 29 - November 1, 2013. The conference aims to promote research and education on all aspects of signals and information including Biomedical Signal Processing and Systems (BioSiPS), Signal Processing Systems: Design and Implementation (SPS), Image, Video, and Multimedia (IVM), Speech, Language, and Audio (SLA), Signal and Information Processing Theory and Methods (SIPTM), and Wireless Communications and Networking (WCN). The conference proceedings are published and accessible via IEEE Xplore and APSIPA website, http://www.apsipa.org/. The technical program included 8 tutorial sessions, 3 keynote speeches, 2 plenary sessions, 1 forum discussion session on the interaction of academia and industry, together with 48 oral sessions. Three best awards were announced in the conference banquet.

The Best Paper Award in IVM Track

"3D Shape Retrieval focused on Holes and Surface Roughness"

Masaki Aono, Hitoshi Koyanagi and Atsushi Tatsum

The Best Paper Award in SLA Track

"Toward Musical-Noise-Free Blind Speech Extraction: Concept and Its Applications"

Ryoichi Miyazaki, Hiroshi Saruwatari, Satoshi Nakamura, Kiyohiro Shikano, Kazunobu Kondo, Jonathan Blanchette and Martin Bouchard

The Best Paper Award in WCN+SIPTM Track

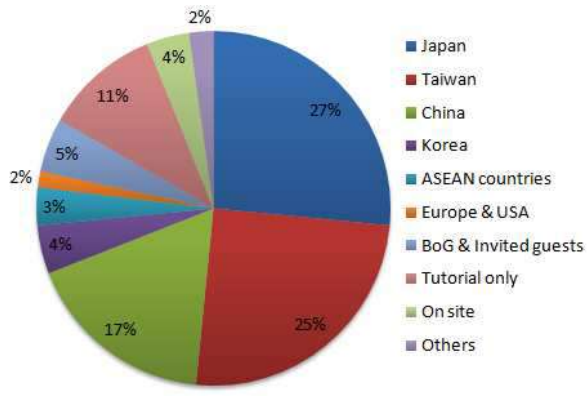
"Sum-Rate Maximization and Energy-Cost Minimization for Renewable Energy Empowered Base-Stations using Zero-Forcing Beamforming"

Yung-Shun Wang, Y.-W. Peter Hong and Wen-Tsuen Chen

Statistics & Facts about APSIPA ASC 2013

- 114 regular papers are accepted out of 157 papers.
- 172 papers in 32 special sessions.
- Totally 407 papers presented from 21 nations.

Participants in APSIPA ASC 2013



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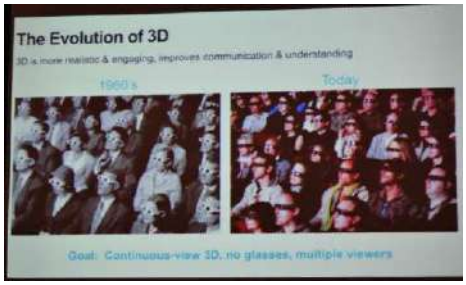
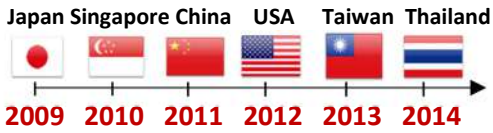
Activities in APSIPA ASC 2013



APSIPA ASC 2013 prepared a series of social program, including a welcome reception, a conference banquet with wonderful musical numbers as well as the stunning and inspiring drum dancing arts for all registrants. There were also buffet banquet and a cruise banquet touring around Kaohsiung harbor, which is the largest international commercial port in Taiwan and is one of the leading Container ports in the world.

The next ASIPA ASC 2014 will be held in Chiang Mai, Thailand, from December 9 - 12, 2014. For more information, please go to the website http://www.apsipa2014.org/.

Previous & Next APSIPA ASC



Reported by Werapon Chiracharit (King Mongkut's University of Technology Thonburi; KMUTT)

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Written by:
Asst.Prof.Chiranut Sa-ngiamsak
KKU

Inside this issue:

ISPACS 2013

International Symposium on Intelligent Signal Processing and Communication Systems (ISPACS) as the well-known international conference focusing on intelligent signal processing and communication systems was launched in Taipei, Taiwan in 1992, and then continued to be annually organized in many prominent cities in Asia-Pacific region such as Sendai Japan (1993), Seoul Korea (1994), Singapore (1995), Kuala Lumpur, Malaysia (1996), Melbourne Australia (1997), Phuket Thailand (1998), Honolulu USA (1999), Nashville USA (2001), Kaohsiung Taiwan (2002), Awaji Island Japan (2003), Seoul Korea (2004), Hong Kong China (2005), Yonago Japan (2006), Xiamen China (2007), Bangkok Thailand (2008), Kanazawa

Hawk Eye View of Naha Okinawa from a World Heritage site, Shurijo Castle.

Japan (2009), Chengdu China (2010), Chiangmai Thailand (2011), and Taipei Taiwan (2012). This is the fifth time for Japan to host the ISPACS, and the first time for Okinawa Island [Int.Steering Chair Message]

Welcome Reception on the 12 November 2013 at Okinawa Jichi-Kaikan(Okinawa Pref. Municipal Center)

General Chair, Prof. Akira Taguchi, Tokyo City University, Japan during the Opening Ceremony

Keynote Speakers

Prof. Hiroyuki Morikawa
The University of Tokyo
Japan

Topic: *"M2M for Driving Social Innovation"*

Prof. Byeong Gi Lee
Seoul National University
Korea (Fellow of the IEEE)

Topic: *"ICT for Knowledge-Creative Society"*

Masaki Fujimoto
SVP, Engineering and CTO,
GREE, Inc., Japan

Topic:*"Managing and Extending Global Internet Services"*

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Technical Program

The Opening Speech given by Honorary Chair Prof. Kaoru Arakawa; while ISPACS founders, Prof.Byeong Gi Lee and Prof.Tomonori Aoyama also attended the conference.

ISPACS 2013 was carried out in three days. There are 35 sessions and they were categorized into 2 plenary , 25 regular and 8 special sessions. The topic of special sessions are:

- "Speech and Acoustic Signal Processing in Noise Environment 1 and 2"
- "Recent Topics on MU/SU-MIMO Communication Systems 1 and 2"
- "Biosignal Processing and Image Signal Processing 1 and 2"
- "Interference Coordination, Mitigation, and Cancellation for Future Radio Access"

Oral Presentation

Message from International Steering Committee Chair,Kosin Chamnongthai from King Mongkut's University of Technology Thonburi, Bangkok, Thailand

"Big Data and M2M (Machine-to -machine) will be the key for realizing designing a future"

[Prof. Hiroyuki Morikawa]

Statistical Data: Submission

217 manuscripts from 21 countries were submitted to ISPACS 2013. Those manuscripts are from:

- Belgium 4
- China 12
- Egypt 2
- Germany 2
- Indonesia 4
- Japan 97
- Malaysia 6
- Pakistan 7
- Singapore 2
- Taiwan 30
- USA 6
- Brazil 1
- Denmark 1
- Finland 1
- India 6
- Iran 2
- Korea 8
- Mexico 1
- Saudi Arabia 2
- Spain 1
- Thailand 22

Statistical Data: Acceptance and Awards

Out of 217 submission, 164 manuscripts (75.6%) were accepted. Those accepted manuscripts are from 19 countries. 130 were presented in regular sessions while 33 manuscripts were in special sessions.

Paper Award Selection:

1. Best Paper Award

"Interference Migigation Technique for Femtocell Networks"

by J.Bak, W.Lee, H.Park, and I.Lee from Korea University

2. Outstanding Student Paper Award

"High-Speed NB-LDPC Decoder for Wireless Applications"

by F.G.Herrero, M.J.Canet, and J.Valls from Universitat Politècnica De València

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WELCOME TO ISPACS2014

The International Symposium on Intelligent Signal Processing and Communication Systems (ISPACS) is the premier networking forum of leading researchers especially from Asia-Pacific basin in the highly active fields of theory, design and implementation of intelligent signal processing and communication systems.

ISPACS 2014 will be held in Kuching, Sarawak, Malaysia from 1st to 4th December 2014.

Important Dates:

9 June 2014 : Deadline for Special Session Proposal

14 July 2014 : Deadline for Submission of Full Paper

15 Sept. 2014 : Notification of Acceptance

13 Oct. 2014 : Deadline for Submission of Camera Ready Paper

"ISPACS is a premier networking forum of leading researchers especially from Asia-Pacific"

ISPACS 2013 Social Events

The Grand Banquet was set on Thursday, 14 November 2013. The dinner was served on Sunset Dinner Cruising along Naha Wharf.

Okinawa folk music using their *sanshin* (guitar) and EISA (a folk dance) with a set of *shima-daiko* (Okinawan drums) were performed . The participants were served with a glass of *awamori*, the signature liquor of these islands.

ISPACS 2015

ISPACS has been run by three groups of committees: organizing, international steering, and international advisory. Those 3 set of committees has an annual meeting. Assc.Prof.Kosin Chamnongthai has been the chair for two years and the next year Prof.Kaoru Arakawa will take the position. The destination of ISPACS 2014 and 2015 will be in Sarawak, Malaysia and Bali Indonesia, respectively

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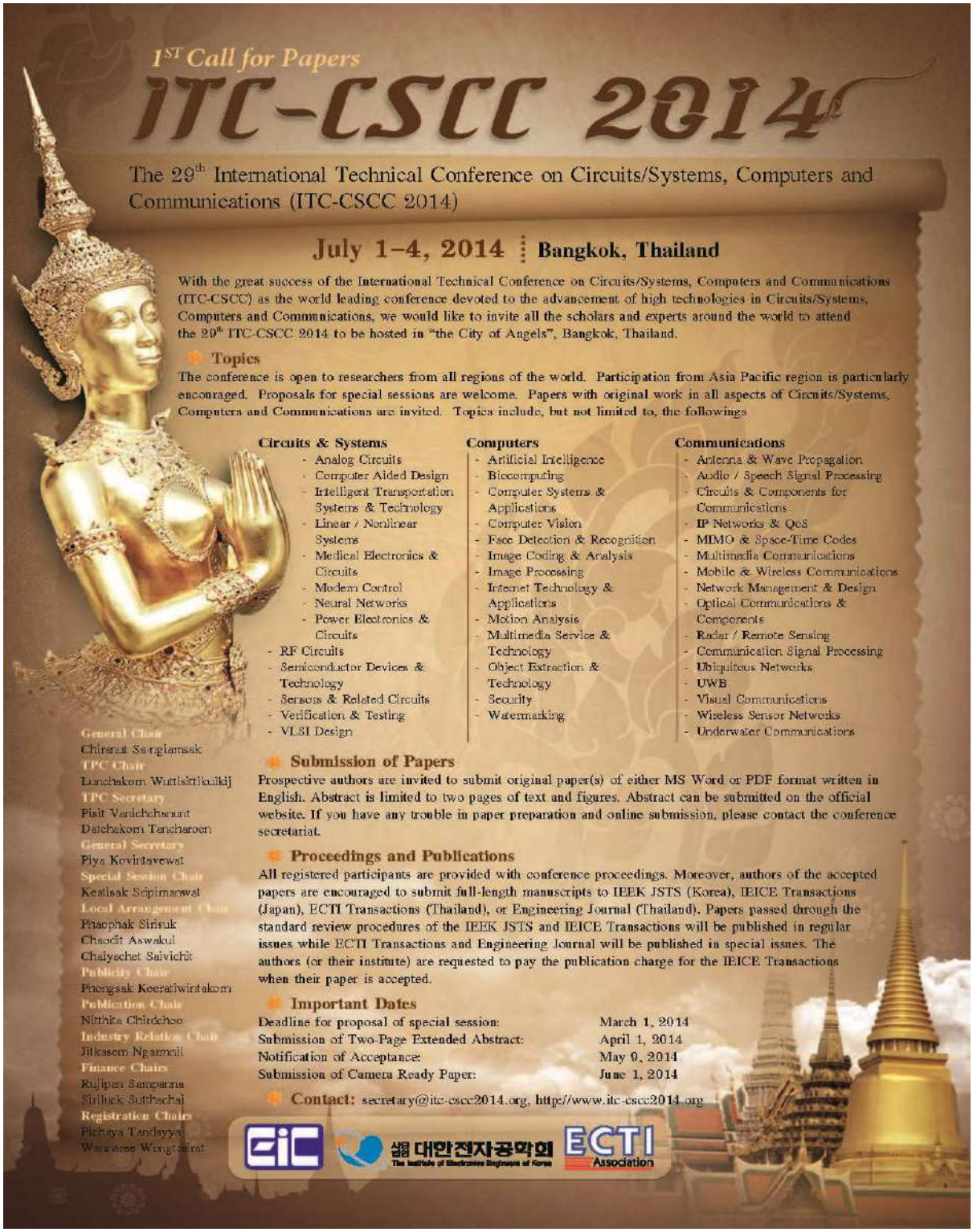

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ECTI-CON 2014

Nakhon Ratchasima, Thailand May 14-17, 2014

ECTI-CON 2014 is the eleventh annual international conference organized by Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI) Association, Thailand. The conference aims to provide an international platform to present technological advances, launch new ideas and showcase research work in the field of electrical engineering, electronics, computer, telecommunications and information technology. Accepted papers will be published in the Proceedings of ECTI-CON 2014 and will be available via IEEE Xplore. Acceptance will be based on quality, relevance and originality.

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Chatree Sangprachathanarak (NetApp, USA)

Call for Papers:

The program of ECTI-CON 2014 will consist of regular technical sessions and special sessions. Topics of interest for submission include, but are not restricted to:

Area 1) Device, Circuits and Systems: Semiconductor Devices, Analog Circuits, Digital Circuits, Mixed Signal Circuits, Nonlinear Circuits and Systems, Sensing and Sensor Networks, Filters and Data Conversion Circuits, RF and Wireless Circuits, Photonic and Optoelectronic Circuits, Low Power Design and VLSI Physical Design, Biomedical Circuits, Assembly and Packaging Technologies, Test and Reliability, Advanced Technologies (i.e. MEMS and Nano-electronic Devices, Metamaterials), Agritronics, Embedded Systems;
Area 2) Computers: Computer Architecture, Computational Biology and Bioinformatics, Knowledge and Data Engineering, Learning Technologies, Multimedia Services and Technologies, Mobile Computing, Parallel/Distributed Computing and Grid Computing, Pattern Analysis and Machine Intelligence, Software Engineering, Visualization and Computer Graphics;
Area 3) Information Technology: IT Bio/Medical Engineering, Bioinformatics and Applications, Ontology, Business and Information Systems, Information Security and Forensics, Information Retrieval, Data Mining, Knowledge Management, Electronic Commerce, Health and Medical Informatics, Hybrid Information Technology
Area 4) Communication Systems: Communication Theory and Information Theory, Antenna and Propagation, Microwave Theory and Techniques, Modulation, Coding, Channel Analysis, Network Design, Network Protocols, Networks Management, Optical Communications, Wireless/Mobile Communications & Technologies, Green Wireless Networks, Green Radio;
Area 5) Controls: Control Theory and Applications, Adaptive and Learning Control Systems, Fuzzy and Neural Control, Mechatronics, Manufacturing Control Systems and Applications, Process Control Systems, Robotics and Automation;
Area 6) Electrical Power Systems: Power Engineering and Power Systems, Electromagnetic Compatibility, Energy Conversion, High Voltage Engineering and Insulation, Power Delivery, Illumination, Renewable/Alternative Energy, Energy Policy and Planning;
Area 7) Power Electronics: Power devices and components, Power Quality Control, Harmonic Analysis and Compensations, Switching Circuits and Power Converters, Motors and Drives, Smart Grid, Distribution Generation and Electrical Vehicles, Photovoltaic Materials and Solar Cells;
Area8) Signal Processing: Signal Processing Theory, Digital Signal Processing Algorithms, Digital Filter Design & Implementation, Array Processing, Adaptive Signal Processing, Audio, Speech and Language Processing, Image and Video Processing, Medical Signal Processing, Medical Imaging;

Paper Submission: The review process of ECTI-CON2014 is "double-blind". Therefore, papers must be submitted without author's names and affiliations appearing in the manuscripts submitted for review. Prospective authors are invited to submit original full papers without author's names and affiliations, in English, of four to six (4-6) pages in standard IEEE two-column format only, reporting their original work and results, applications and/or implementation in one or more of the listed topics. Paper format (Doc/LaTeX) can be downloaded at http://www.ecticon2014.org.

Important dates
- Full paper submission due date: January 6, 2014
- Notification of acceptance: March 6, 2014
- Camera-ready paper submission: April 1, 2014
- Authors and Early-bird registration: April 1, 2014

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ECTI Who's Who