THE 3rd INTERNATIONAL CONFERENCE ON UNIVERSAL VILLAGE (UV2016) OCTOBER 6-8, 2016, NAGOYA, JAPAN

Expand our horizon: UV for regions at different developing phases, and for people at different ages, with various technology & culture backgrounds.

R.S



UV2016, Nagoya, Japan

LEAGE

HUMANKIND IN HARMONY WITH NATURE THROUGH WISE USE OF TECHNOLOGY

Contents

Greetings From Conference Chairs	1
Keynote Speech	7
Special Session: Future Talk	11
Special Session: Executive Session	13
Special Session: Mayors' Forum	15
Special Session: Students' Forum	17
Program at a glance	19
Program Details	23
Committees	37
Sponsors & Exhibitors	43
Useful Information	45

Greetings From Conference Chairs

General Chair, Professor Berthold K. P. Horn:



It is great to see all of you here at the International Conference on Universal Village.

We live at a unique time in history where, on the one hand, marvelous new technology is available, and on the other hand, great societal needs have arisen. The new technology comes in part from the maturation of computer hardware and software and in part from better understanding and modeling of the physical processes underlying systems interactions particularly those of a living community.

In some cases, we even have the unique opportunity to "start from scratch" in that, with rapid growth in some of the developing

world, it is possible to actually design communities and the underlying infra-structure to better suit the modern world.

At MIT, we have a diverse set of efforts addressing different aspects relevant here today, including intelligent traffic research and work on machine vision, my own specialty. But there is much more to this topic and we will hear about that in the next two days.

But I won't take any more of your time since I am sure you are eager to hear the technical presentations, as I am, since that, after all, is why we are all here.

General Chair, Professor Kazuya Takeda:



Dear Friends and Colleagues,

It is a great pleasure and an honor to welcome you to the third Conference of Universal Village, UV2016 and to Nagoya University! On behalf of the organizing committee, I would like to extend my appreciation to all participants of the conference.

Thanks to the hard work of the organizing committee, I am proud of attractive events as well as technical sessions hosted by the UV2016. The first day begins with a keynote speech by Professor Yasura, vice president of the Kyushu University.

Thereafter, in the special executive session to be held in the afternoon, two advisors to senior government officials of Japan and USA will give lectures on what academia can

do for the future of our society. In that session, vice presidents of Japan's major national universities will join in the discussion.

On the second day, two crucially important forums, the mayor's forum and the student's forum are scheduled. Those two forums will discuss universal village in terms of current and future issues and technologies. I also believe that the excursion to Asuke Village, on the third day, will be a perfect opportunity of us to practically consider some specific problems in the discussions during the sessions.

I hope all participants will enjoy technical presentations and joining discussions throughout the conference.

Again, thank you very much for your participation in the UV2016.

General Chair, Dr. Ichiro Masaki:



Welcome to the International Conference on Universal Village. Universal Village (UV) is a desired future society which provides their residents with sustainable happiness. In order to develop UV, we take a top-down or, in other words, systemoriented approach instead of a bottom-up or element-oriented approach. In the development process, a higher-level objective such as sustainable happiness of the residents defines lowerlevel objectives including environment protection, energy management, communication, healthcare, transportation, and other related systems. Feedback from the bottom to the top is also important in this integration and collaboration. I hope this conference stimulates various kinds of collaborations.

At the end of my greeting, I would like to say "Congratulations!" to everyone who contributed to starting up this conference. Please enjoy the conference. Thank you very much!

General Chair, Professor Zhang Xiong:



higher-level objective.

Dear Friends and Colleagues,

It is our greatest pleasure to welcome you to the 3rd International Conference on Universal Village (UV2016) at Nagoya, Japan. As one of the collaborations, Beihang University has been working on the creating "smart city" in China for a long time, in which we pay more attention to the technical level and the city part. Here, in the UV conference, we would like to pursue human-nature harmony through wise application of technologies for a

When I attended the UV conference in Beijing in 2013, I found that UV conference is unique and special. Since its first edition, UV has attracted rich diversity of authors and speakers from universities, industries, government and public sectors, etc., around the world to share their ideas and advances in overcoming the challenges during the urban development. I am also pleased to note that the UV conference has grown gradually in scale, depth and also influence.

A lot of information from multi-disciplinary fields will be presented in the three-day conference, so that researchers with different background can collaborate beyond the traditional boundaries of their individual research fields. I hope you can find a systematic, coordinated, long-term solution for the future of human kind and nature at the end of this conference. As the theme for UV2016, we would like to expand our horizon: UV for regions at different developing phases, and for people of different ages, with various technology & culture backgrounds.

Finally I want to extend my thanks to those who are truly responsible for making UV 2016 a successful event by devoting their time and energy.

Thank you very much for attending UV2016!

Technology Chairs: Dr. Xiaoman Duan, Professor Yasha Yi, Professor Juejun Hu



On behalf of the Universal Village International Conference Technology committee, we warmly welcome you to the 3rd semi-annual Universal Village International Conference in Japan! We have gathered here from around the world with a common purpose: to make this world

a better place, a Universal Village that we can all call home. We are here to challenge environmental problems that threaten the quality of our lives; we are here to share our advanced research results and experiences working with the concept of a Universal Village; we are here to discuss the issues we have come across in our research efforts and to collectively find potential solutions as well as pose new questions; and lastly, we are here to discuss how we can create milestones for the Universal Village through innovation, technology, and the endless human capacity for learning and discovery.

We are exceedingly grateful for your great contribution to UV2016! Without you UV2016would not be happening today! And it is you who will make UV2016 successful! It is you who will give our "Universal Village" a brighter future! Please accept the deepest appreciation from our UV Technology Committee.

Conference Chairs: Dr. Yajun Fang, Professor Yoshiki Ninomiya:



We would like to express our warmest welcome to all attendees to the third International Universal Village Conference, UV2016. We would also extend sincere thanks to the local host, Nagoya University and all supporters of UV2016 during the conference preparation in the past. As you all have known, human being has been making great stride in modern technology. In the meantime, Mother Nature has been enduring the footprint left by the evolution of human society. The challenge is how to achieve harmony between human and nature so that sustainable happiness may be realized for all community members.

The concept of "Universal Village (UV)" is proposed as a possible solution to the challenge. UV comprises the following aspects: multi-functional multi-format communities and a new life style incorporating the ideal mixture of city and suburban areas. A systematic design approach will be wisely used to satisfy the needs from human and nature. The theme for UV2016 is "Expand our horizon: UV for regions at different developing phases, and for people of different ages, with various technology & culture backgrounds." It is expected to pursue how the regional/cultural/technical factors would have impact on future UV development in different regions. We sincerely wish innovative ideas for UV may be born through the interaction among the experts from different fields. We hope everyone will enjoy UV2016 and have a good time in Nagoya, Japan.

Program Chairs: Professor Hao Sheng, Professor Jing Ma, Professor Takayuki Morikawa, Dr. Chendi Li, Dr. Ruitao Wen



We are very glad to see you in Nagoya for this special occasion of UV2016.

Nagoya, the 3rd largest metropolitan area in Japan, is famous for mobility industries such as cars, trains, aircrafts, and space rockets. In this conference we would like to demonstrate some of the mobility related researches and practices. We believe mobility is one of the key factors for sustainable happiness especially in the aged society that Japan is facing. Advanced driver assistance system, automated driving, ride sharing, car sharing and demand response public transportation are some of the technological solutions for that. Of course UV2016 covers much wider areas of researches headed for a desired future society. We hope all the participants can exchange great knowledge and experiences and enjoy stay in Nagoya.

Keynote Speech

Room: Symposion Time : 9:15-11:00, Oct. 6th (Thu.)

Urban OS as a social ICT platform to realize sustainable city with citizen participation

Hiroto Yasuura, Vice President of Kyushu University

Recent rapid progress of information technology such as analysis of big data and open data, Internet of Things (IoT) and Artificial Intelligence (AI) will enable us to collect variety of societal data, utilize them publicly and privately, and reorganize social infrastructure. Collected big data by IoT with trillion sensors are analyzed by advanced analysis technologies including deep learning. Open data enables people to use publicly disclosed societal information in government sectors.

Upon this movement, citizens can utilize variety of societal data, use open license software and applications for analysis, and create collaborative applications. If everyone can access any information of city, citizens themselves can create solutions for their immediate problems locally and directly. A part of social services are replaced by citizen's agile activities and we can reduce local government's cost. This is one of the ways to sustainable city and society with small government.

Three social and technological trends are required to realize the sustainable society;

- 1) Everyone actively participates in social solution development.
- 2) Society allows mixed utilization of cross-domain data.
- 3) People change acceptability of sharing their data and belongs.

Analysis of cross-domain data such as people's movements and energy let us understand social activity precisely. Observation of dynamics of the real world let us understand overhead and waste of activities in the city. Using the shared data, everyone can propose solutions of common problems by sharing resources and goods.

In Kyushu University Center of Innovation (COI) program, Urban Operating System (Urban OS) as a social ICT platform is proposed. Urban OS collects and provides crossdomain data in public. In the COI project, traffic and energy domain research are in progress as examples of actual applications. Research objective is to create a convenient and smart traffic control system, and an advanced analysis system for energy prediction and high level balancing using cross-domain data. In this presentation, a concept and research activities on Urban OS are introduced and a future vision of sustainable city is proposed.

Stop wasting time and fuel in traffic jams

Berthold K. P. Horn, Professor of MIT, General Chair of UV2016

An urban commuter in the USA spends 38 hours stuck in traffic per annum on average, and wastes 72 liters of fuel, which adds 172 kgs of CO_2 to the atmosphere (according to the Texas A&M Transportation Institute). Overall, in the USA alone, the costs of congestion are estimated to be around \$121 billion per annum (\$820 per commuter), with 11 billion liters of fuel wasted, and 25.4 billion kgs of extra CO_2 emitted. Speed variability inherent in traffic flow instabilities also increases the risk of collisions.

Stop-and-go traffic is a common form of congestion (as are so-called "phantom traffic jams"). It is well known that sequences of "car following" vehicles—whether controlled by humans or some form of automation, such as adaptive cruise control—are inherently unstable. There are hundreds of papers explaining this, going back all the way to the 1930s.

Bilateral control can suppress traffic flow instabilities. Bilateral control differs from "car following" and adaptive cruise control in that, counter-intuitively, it uses information about the *following* vehicle (as well as about the *leading* vehicle). Stability can be demonstrated using simulation or mathematical analysis.

A physical analog of a sequence of vehicles using bilateral control is a chain of masses connected by springs and dampers—a system which is inherently stable, since it lacks an external energy source. To further understand bilateral control and its capacity to suppress instabilities, it is useful to move from a microscopic view (interaction of individual vehicles) to a macroscopic view (densities and flow rates). This leads to a damped non-linear wave equation that governs traffic under bilateral control. The equation allows us to determine the speed of propagation of disturbances, as well as their rate of decay, and suggests improved control strategies.

Instabilities presently occur at high traffic densities. So one attempt at improving matters in the past has been to limit density, by, for example, controlling highway entrances. But this comes at the cost of reducing the potential throughput. Bilateral control has the potential to increase throughput of highways by up to a factor of two, because it can operate stable at higher densities. Other benefits include reduced travel times and calmer nerves.

Implementation of bilateral control requires only a modest additions to existing adaptive

cruise control systems: namely adding sensors in the rear to those that already exist in front of the vehicle. The sensors can be of various types, including radar and machine vision, anything that can be used to estimate the distance and relative speed of the leading vehicle and the following vehicle.

One impediment to rapid deployment is the fact that the full benefit of the system will only be apparent when a significant fraction of vehicles use bilateral control. So it is imperative that implementations of adaptive cruise control make the small additions needed to enable bilateral control. It may also be necessary for agencies in charge of transportation to mandate its use.

Smart City Standardization Progress in China

LV Weifeng, Dean of Beihang University

A smart city comprises a huge number of information systems deployed across the city. Different systems have different stakeholders, domains and usage contexts. As such to have a standard system for smart city is essential to maintain interoperability among different information systems to ensure event awareness. This talk will present China's strategy and current progress in smart city standardization.

Special Session: Future Talk

Backcasting from Future Society

Room: Symposion Time: 11:20-12:20, Oct. 6th (Thu.)

Brain Network Analysis for Revealing Neural Circuits that Govern Human Cognitive Process from MRI Datasets: Background, Methods & Applications

Zhishun Wang (Professor of Columbia University)

Nagoya COI (COI: Center of Innovation Program)

Takayuki Morikawa (Professor of Nagoya University, Japan), Hiroko Kamide (Associate Professor of Nagoya University, Japan)

Special Session: Executive Session

Chair: Shuzaburo Takeda (Advisor to Ministry of Education, Culture, Sports, Science and Technology) Room: Symposion Time: 15:30-17:00, Oct. 6th (Thu.)

Key science and stem technologies for SDGs and Universal Village

Speaker: William Colglazier (Former Science and Technology Adviser to the U.S. Secretary of State Discussant: Sei'ichi Matsuo (President of Nagoya University) Hiroto Yasuura (Vice President of Kyushu University) Hiroshi Kanai (Vice President of Tohoku University) Miki Haseyama (Advisor to the President of Hokkaido University)

In this executive session, the role of Science and Technology for the Universal Village will be discussed by policymakers and university presidents.

Dr. E. William Colglazier is Editor-in-Chief of Science & Diplomacy and Senior Scholar in the Center for Science Diplomacy at the American Association for the Advancement of Science (AAAS). He served as the Science and Technology Adviser to the U.S. Secretary of State from 2011 to 2014. From 1994 to 2011, he was Executive Officer of the U.S. National Academy of Sciences and the National Research Council where he helped to oversee the studies that provide independent, objective scientific advice on domestic and international public policy issues. He received his Ph.D. in theoretical physics from the California Institute of Technology in 1971, and prior to 1994 worked at the Stanford Linear Accelerator Center, the Institute for Advanced Study in Princeton, the Center for Science and International Affairs at Harvard's Kennedy School of Government, and the University of Tennessee. He is past chair of the Forum on Physics and Society of the American Physical Society (APS) and a Fellow of the AAAS and APS. In 2015 he received from the APS the Joseph A. Burton Forum Award for "outstanding contributions to the public understanding or resolution of issues involving the interface of physics and society" and from the Japanese Government the Order of the Rising Sun, Gold Rays with Neck Ribbon, for "contributing to science and technology exchange and mutual understanding between Japan and the United States." He co-chairs the 10-Member Group appointed by the U.N. Secretary General to advise on science, technology, and innovation for achieving the Sustainable Development Goals.

Special Session: Mayors' Forum

Chair: Takayuki Morikawa (Professor of Nagoya University, Japan) Guoping Zhang (Professor of Harvard University & Nankai University, CEO of China Association of Corporate Governance) Francisco Bozzano-Barnes (Spain) Room: Symposion Time: 9:00-10:30, Oct. 7th (Fri.)

Aiming for an Environmentally Advanced City: City of Toyota

Toshihiko Ota (Mayor of Toyota city, Japan)

A New Digital Democracy for Smart Cities

Miguel Arana Catania (Director for Participation of the City of Madrid, Spain)

International Universal Village Proposal (IUVP)

Guoping Zhang (Professor of Harvard University & Nankai University, CEO of China Association of Corporate Governance)

Special Session: Students' Forum

Room: Conference Room E and Symposion Time: 10:30-18:00, Oct. 7th (Fri.)

Student participants: Esra Ahunbay (Swiss Federal Institute of Technology in Lausanne) Gizem Demircioglu (New York University) Yansong Tang (University of California, Los Angeles & TSinghua University) Michael James Ragone (University of Arizona) Huaguo Liu (Sichuan University) Sijian Lin (Sichuan University) Shuo Zhang (Beihang University) Yang Zhang (Beihang University) Takumi Ban (Nagoya University) Hyuntai Chin (Nagoya University) Miho Toyama (Nagoya University) Dongjin Lee (Nagoya University) Shogo Seki (Nagoya University) Ruotian Tang (Nagoya University) *Isis Amorim de Oliveira (Nagoya University)*

This session is support by graduate program for Real World Data Circulation Leaders at Nagoya University.

Program at a glance

2016 3rd International Conference on University Village (UV2016) Program																					
	Wed,	5-Oct	Thur	Thursday, 6-Oct Sat, 8-Oct Sat, 8-Oct																	
			тоуос	Toyoda Auditorium Toyoda Auditorium						EXCL	Irsion										
			S	ymposion	Room	E	Symposion Room A		Room B		Room C										
8:30				I													8:30				
8:45			8	:45-9:15											Move	by bus	8:45				
9.00			Openi	ing Ceremony											Kanay	ama to	9.00				
9:20																10	9:20				
9:30							9:00-	10:30									9:30				
9:40			9:15-11:00 Keynote Speech								ма	yors									9:40
9:50							FOI	um							Move	by bus	9:50				
10:00															NU to	Asuke	10:00				
10:10]		10:10				
10:20																	10:20				
10:30							ļ										10:30				
10:40																	10:40				
10:50													10:40	-11:40	Introd	luction	10:50				
11:10			Co	ffee Break			10:40	-12:00	10:40	12:00	10:40	12:00	Ses	sion	Bro	viect	11:10				
11:20							Ses	sion	Ses	sion	Ses	sion	11	-3	@A	suke	11:20				
11:30							I-	1A	V	n	1	/			Hospital		11:30				
11:40			11	:20-12:20													11:40				
11:50			Fu	uture Talk										1			11:50				
12:00									••••••		••••••		1		1		12:00				
12:10																	12:10				
12:20										Lur	nch				1.00	nch	12:20				
12:30																	12:30				
12:40																			12:40		
12:50				Lunch							r					12:50					
13:00								13:00	13:40						13:00						
13:10						Ses	sion						13:10								
12:20					10:40-17:00		13:00-14:20	VI	I-1						13:20						
13:40					Students'		Ses	sion			13:00-14:50					13:40					
13:50					Forum		Forum I-1B			Session		1			13:50						
14:00					Discussi	ion			13:50	·14:30	IV-1		13:00-15:20			14:00					
14:10			13	:40-15:10				Ses	sion		Session		ision	Tour of Traditional	14:10						
14:20			C	onference			-	2			11-1		14:20								
14:30			Overview											and Acuke	14:30						
14:40							14:30-15:30							Fes	tival	14:40					
14:50							Ses	sion	14:40	15:40						14:50					
15:00								ŀ	· 2	Ses	sion							15:00			
15:10			Coffee Break						VI	1-2	15:00-	-15:50		·	-		15:10				
15.20											TV	- 7					15.20				
15:40											10	-					15:40				
15:50			15:30-17:00 Executive Session Sessio														15:50				
16:00										15:30	-17:10			16:00							
16:10						15:40	-17:15	15:50	-16:50	16.00	17:00	Ses	sion			16:10					
16:20							Ses	sion	VT	I-3	10.00- Cen	sion	п	-2	Mour	by bur	16:20				
16:30							I	п			IV	-3			Acu	ke to	16:30				
16:40															Kana	yama	16:40				
16:50															and	1 NU	16:50				
17:00																	17:00				
17:10							17:15	-18:00						<u> </u>			17:10				
17:20			Move	e by Subway			Stud For	um									17:20				
17:40							Wra	p-up									17:40				
17:50							Ses	sion							-		17:50				
18:00							18:00	-18:30						1	t		18:00				
18:10	18:00-	20:00	10:00 20:00				Clo	sing						1			18:10				
18:20	Rece	ntion	18	Banquet			Cere	mony									18:20				
18:30	@To	yoda	@ANA	A Crown Hotel											ļ		18:30				
19:00	Aud it	orium															19:00				
19:30				······										<u> </u>	L		19:30				
20:00														1	1	1	20:00				

Venue Map





23

Program Details

Day 1, Oct. 6th (Thu.)

Opening Remarks

8:45-9:15 Welcome Speech by General Chair of UV2016 *Kazuya Takeda (Professor of Nagoya University)* Welcome Speech by Nagoya University *Sei'ichi Matsuo (President of Nagoya University)* Welcome Speech by Founder of Universal Village, *Ichiro Masaki (Professor of MIT)*

Keynote Speech

9:15-9:50 Urban OS as a social ICT platform to realize sustainable city with citizen participation *Hiroto Yasuura (Vice President of Kyushu University)*9:50-10:25 Stop wasting time and fuel in traffic jams *Berthold K. P. Horn (Professor of MIT, General Chair of UV2016)*10:25-11:00 Smart City Standardization Progress in China *LV Weifeng (Dean of Beihang University)*

Coffee Break

11:00-11:20 Coffee Break

Symposion

Symposion

Symposion

Backcasting from Future Society

11:20-12:20 Brain Network Analysis for Revealing Neural Circuits that Govern Human Cognitive Process from MRI Datasets: Background, Methods & Applications *Zhishun Wang (Professor of Columbia University)* Nagoya COI (COI: Center of Innovation Program) *Takayuki Morikawa (Professor of Nagoya University, Japan), Hiroko Kamide (Associate Professor of Nagoya University, Japan)*

Conference Overview

Symposion

Chair: Kazuya Takeda

13:40-15:10	Introduction of Sessions
	Session I -1A [Intelligent Transportation (1)]
	Session I -1B [Intelligent Transportation (2)]
	Session I -2 [Urban Management]
	Session I -3 [Smart Land Use]
	Session II -1 [Intelligent Healthcare]
	Session II -2 [Intelligent Life Support]
	Session II -3 [Human Robot Interaction]
	Session III [Intelligent City]
	Session IV -1 [Microbial Technology & Environmental Protection]
	Session IV-2 [Smart-City Trash Management and Treatment for Zero-
	Emission]
	Session IV-3 [Climate Changes & Future Life Styles]
	Session V [Data Management & Visualization]
	Session VI [Intelligent Materials]
	Session VII -1[Lighting, Healthcare and Future Life Styles]
	Session VII -2 [Human Factors]
	Session VII -3 [Special Session - Persuasive City]
	Mayors' Forum
	Students' Forum

Executive Session

Chair: Shuzaburo Takeda (Advisor to Ministry of Education, Culture, Sports, Science and Technolog)

15:30-17:00 Key science and stem technologies for SDGs and Universal Village Speaker: William Colglazier (Former Science and Technology Adviser to the U.S. Secretary of State) Discussant: Sei'ichi matsuo (President of Nagoya University) Hiroto Yasuura (Vice President of Kyushu University) Hiroshi Kanai(Vice President of Tohoku University) Miki Haseyama (Advisor to the President of Hokkaido University)

Banquet

18:00-20:00 ANA CROWNE PLAZA Hotel Grand Court NAGOYA

Day 2

Mayors' Forum

Symposion

Chair: Takayuki Morikawa (Professor of Nagoya University, Japan) Guoping Zhang (Professor of Harvard University & Nankai University, CEO of China Association of Corporate Governance) Francisco Bozzano-Barnes (Spain)

9:00-10:30 Aiming for an Environmentally Advanced City: City of Toyota Toshihiko Ota (Mayor of Toyota city, Japan)

> A new digital democracy for smart cities Miguel Arana Catania (Director for Participation of the City of Madrid, Spain) International Universal Village Proposal (IUVP) Guoping Zhang (Professor of Harvard University & Nankai University, CEO of China Association of Corporate Governance)

Students' Forum

Conference Room E and Symposion

10:40-17:15Discussion in Conference Room E17:15-18:00Presentation in Symposion

Session

Category I. Intelligent Transportation and Urban Planning

- Intelligent transportation systems & intelligent vehicles
- Human-centered transportation
- Urban planning

Session I -1A:	Intelligent Transportation (1)	Symposion
	Chair: Toshiyuki YAMAMOTO (Nagoya University,	
	Japan)	

10:40-12:00 Sensor Network System for the Infrastructure Asset Management Koichiro Yamashita, Koji Kurihara, Huangchun LI, Chen AO, Yi XU, Jun TIAN, Keiji Kimura, Hironori Kasahara Stated Preference Analysis on Egress Behavior after Large-scale Event in Singapore Takuro Ikeda, Vishal Sharma, Eiji Kitagawa, Taizo Anan [Invited Talk] Traffic Management and Automated Driving Utilizing Dynamic Maps Takayuki Morikawa, Hiroaki Takada

Session I -1B: Intelligent Transportation (2) Symposion Chair: Yoshiki NINOMIYA (Nagoya University, Japan)

13:00-14:20 [Invited Talk] Design and Analysis of Cooperative Adaptive Cruise Control Including Human-Driven Car based on Model Predictive Control Framework
Hyuntai CHIN, Hiroyuki OKUDA, Tatsuya SUZUKI
[Invited Talk] Fundamental Investigation on Pro-beam Road Lighting System
Toru Hagiwara, Shunsuke Kohko, Shouji Kobayashi
Spatio-Temporal Appearance Model via Saliency Analysis for Multi-Target Tracking
Yang Zhang, Hao Sheng, Jiahui Chen, Zhang Xiong
Automatic Analysis of Traffic Behavior from Visual Surveillance of Intersection
Shuo Zhang, Yajun Fang, Hao Sheng, Ichiro Masaki, Berthold Horn, Zhang Xiong

Session I -2: Urban Management Symposion Chair: Takayuki MORIKAWA (Nagoya University, Japan)

 14:30-15:30 Flood Prevention Strategy to Reserve Quality Ground Water for Kabul Future Development
 Said Moqeem Sadat, Ikuo Sugiyama, Takahiro Saito, Norikazu Inuzuka
 Rapid Strategic Consensus Building in Land Readjustment in Kabul Nangialai Yousufzai, Eyosiyas Etana, Ahmad Javid Habib, Ikuo Sugiyama A Study on Growth Control Strategy Applying Urban-Agriculture Concept in Kabul City Faridoon AFSHAR, AGA Eyosiyas ETANA, Ikuo Sugiyama

- Session I -3: Smart Land Use Conference Room A Chair: Victor Muhandiki (Nagoya University, Japan)
- 13:50-14:30 Spatial distributions of soil moisture analysis in urban-rural integrated cities: A case study in Wuhan City Nengcheng Chen, Jizhen Lia, Xiang Zhanga, Zeqiang Chen
 A Web-Based Real Property Updating System for Efficient and Sustainable Urban Development: A Case Study in Ethiopia Eyosiyas Etana, Teruaki Yokoyama, Ikuo Sugiyama

Category II. Healthcare and Well-being

- Pervasive & non-invasive health-monitoring
- Personalized healthcare
- Intelligent nursery
- Senior care and assistive technology for mobility-challenged residents
- Public health: the changing trends and emerging new technologies

Session II -1:	: Intelligent Healthcare	Conference Room C
	Chair: Masaru HORI (Nagoya University,	
	Japan)	
13:00-15:20	[Invited Talk] Advanced Surface Modifications vices by Biocompatible Polymer	s of Blood Analysis De-

Madoka Takai [Invited Talk] Integration of Chemistry on a LSI Kazuo Nakazato [Invited Talk] Placing Biomolecules/Cells on a Chip Opens up Fields of Healthcare Applications
Shinya Kumagai
[Invited Talk] Research Platform For Overcoming Stress And Fatigue
Yosky Kataoka
[Invited Talk] The Future of Intelligent Healthcare
Dr Dhesi Baha Raja & Rainier Mallol

Session II -2: Intelligent Life Support Conference Room C Chair: Kenji MASE (Nagoya University, Japan)

15:30-17:10 Unobtrusively Medical and Health Monitoring of Older Adults in Everyday Life Mobility with a Vehicle Kenji Ishikawa, Daisuke Onoshima, Hiroshi Yukawa, Hiromasa Tanaka, Hiroshi Hashizume, Yoshinobu Baba, Masaru Hori, Tersunari Hase, Masashi Kondo, Yoshinori Hasegawa, Masaaki Mizuno, Naoto Kihara, Kihara Tatsukoshi, Hidefumi Odaka Quantified Function Profile Approach for Mobility Impairment People Yusuke Komaba, Brenda M. B. Reginatto, Kenneth Taylor, Cailbhe Doherty, Liang Zhao, Akihiro Inomata, Brian Caulfield Investigation on Recurrent Neural Network Architectures for Daily Activity Recognition Akira Tamamori, Tomoki Hayashi, Tomoki Toda, Kazuya Takeda EEG Features Representing Cognitive and Emotional States Evoked by **Personal Pictures** Shintarou Hayamizu, Junya Morita, Takatugu Hirayama, Kenji Mase, Kazunori Yamada Integrating Auditory Space for Multiple People in Real World Using Their Personal Devices Tomoko Yonezawa, Yosuke Ino, Yuki Ishikawa Can the Backside Third Eye Beat Back Thieves? A Preliminary Experiment to Implement a Wearable Thief Diffence System Yu Enokibori, Taiga Hayashi, Kenji Mase

Session II -3:	Human Robot Interaction
	Chair: Takahiro TANAKA (Nagoya Univer-
	sity, Japan)

Conference Room C

10:40-11:40 Human Robot Interaction for Health Promotion in Informationally Structured Space
Siqi Sun, Takenori Obo, Naoyuki Kubota
A study on Rehabilitating Behavioral Disorders through Seal Robot Paro Suto Noriko
Ready for the "Robot Revolution" ? – Japan's Attempts to Solve Societal Issues by the Implementation of Advanced Robotics
Benjamin Rabe, Martin Rathmann

Category III. Intelligent Communities

- Social media, education and communication
- Security, safety, and privacy protection
- Integrated energy management
- Treatment for zero-emission
- Response to emergency and global climate change
- Intelligent monitoring & sensing
- Seamless wireless network, mobile computing, cloud storage
- Robotics for dynamic applications

Session III:	Intelligent City	Symposion
	Chair: Hiroto YASUURA (Kyushu University, Japan)	

15:40-17:15 Local Energy Management Systems (LEMS) for Local Consumption of Renewable Energy with the Cooperation of Public Facilities *Tatsuro Harada* Establishment of a Novel Power System to Enable Mass Introduction of Photovoltaic Systems with Maintaining its Stability *Ryuji Matsuhashi* Energy Management Systems and their Element Design Example: a General Overview and a Demand Response Program Design *Junichi Murata, Masaru Murakami, Ryohei Funaki* Multi-Layer Energy Management System for High-Level Equalization of Power Supply and Demand *Hisato Matsuo, Maiya Hori* [Invited Talk] Smart City - A Foreseeable Future of Macau *Wei Ke*

Category IV. Ecological System

- Green agriculture
- Ecological economy and strategy
- Integrated solutions to eliminate waste & pollution
- Environmental protection and trash management
- Effective microorganism technology

Session IV -1: Microbial Technology & Environmental Conference Room B Protection Chair: Masaki SHINTANI (Tokyo Women's Medical University, Japan), Toru HI-GASHINAKAGAWA (Waseda University, Japan)

13:00-14:50 Tanah Sutera Development, an eco-city development project in Malaysia: two years on *Hia Hui Ching, Lim Kai Ying, Teh Hui Theng, Ho Siew Chin, Yoshitaka Fukugauchi, Teruo Higa and Steven Shum* Use of EM Technology for controlling foul odors and sanitation concerns caused by massive flood in Thailand in 2011 *Jethamstapong Voranuj, Toru Koshoji, Gen. Satian Pirmthongin* [Invited Talk]Jethamstapong Voranuj, Toru Koshoji, Gen. Satian Pirmthongin *Gede Ngurah Wididana* Effective Microorganisms (EM1) Technology for Sustainable Large Scale Grain Agriculture *Cid Simões* Establishment of human and environmentally friendly hospital with consideration for human and environmental microbiome *Isa Saito, Masaki Shintani, Nami Murakami, Yutaro Aoki and Teruo Higa*

Microbial contribution as countermeasures against radioactive contamination Shuichi Okumoto, Masaki Shintani, Teruo Higa [Invited Talk] A route to co-existence and co-prosperity with microbial power Teruo Higa [Invited Talk] Attempt to create a Universal Village in Amami Oshima, Island, Japan" Yoshihiro Takano, Keigo Nakatani

Session IV -2: Smart-City Trash Management and Conference Room B Treatment for Zero-Emission

> Chair: Gene Fry (USA), Tingying Zeng (Academy for Advanced Research Institute, USA)

15:00-15:50 Study on hydrogen production as a bioenergy with garbage *Matsunori Nara*Effective Microorganisms Technology as an ecological solution for infiertile river bank - Sorek River, Israel *Ori Moran, Sher Maimon, Amir Elron*Developing a municipal solid waste management model for developing cities: the LIMES model (Case studies on Nagoya and Fortaleza) *I.A. de Oliveira*A Real-time, Low-maintenance Sewer Monitering System using Thermoelectric Generators and Adaptive Sensing Technology *N. Kouma, K. Nakagawa, J. Kakuta, K. Kawakami, Y. Kikuchi, Y. Hida, T. Suzuki, H. Chiba, T. Uzumaki*

Session IV -3: Climate Changes & Future Life Styles Conference Room B Chair: Gene R. H. Fry (USA)

16:00-17:00 [Talk + Round table discussion]3.7 to 6.5°C Global Surface Warming from 2016's CO2 and CH4 Levels *Gene R. H. Fry*

Category V. Data Management

- Big data: data storage, vitalization, visualization, integration and mining
- Deep learning
- Planning & decision systems
- Human-centered computing

Session V:	Data Management & Visualization	Conference Room B
	Chair: Guangtao Xue (Shanghai Jiao Tong	
	Univ., P.R.China), Nengcheng Chen (Wuhan	
	University, P.R.China)	

10:40-12:00 A Web-Based Real Property Updating System for Efficient and Sustainable Urban Development: A Case Study in Ethiopia *Eyosiyas Etana, Teruaki Yokoyama, Ikuo Sugiyama* Large-scale Analysis and Diagnosis of Urban Cellular Networks *Zhenxian Hu, Guangtao Xue, Rui Xie, Nicholas Zhang* Spatial-Temporal based Integrated Management for Smart City: Framework, Key techniques and Implementation *Nengcheng Chen* Smart Community By Way of Social Media - A Case of Community on the Palm in Tangshan *LI, Dongquan, Lan, G.Zhiyong Lan, Wei, Ming* [Invited Talk] Medical Big Data: Medical Data Mining and Innovative Applications with Patient Monitoring and Aging Care *Yanchun Zhang*

Category VI. Green Energy and Materials

- Renewable energy: solar, wind, biomass, hydro and their applications
- Energy storage, conversion and transmission
- Smart materials for ecological systems

Session VI: **Intelligent Materials** Chair: Toru UJIHARA (Nagoya University, Japan)

[Invited Talk] Trial of Process Informatics in SiC Solution Growth 10:40-12:00 Toru Ujihara, Shunta Harada, Yosuke Tsunooka, Nobuhiko Kokubo, Kenta Murayama, Ryota Murai, Miho Tagawa [Invited Talk] Electrically Conductive Papers Prepared from Banana **Cellulose Fibers** Phanthitra Anantasattakul, Nagahiro Saito, Ratana Rujiravanit [Invited Talk] Reactive Powder Processing for Porous Al-Ti alloys Makoto Kobashi [Invited Talk] Barium disilicide: earth abundant material for solar cells Noritaka Usami [Invited Talk] Solar Photovoltaics via Photoelectric Conversion of a Monochromatic Light from Solar-Pumped Lasers T. Motohiro, A. Ikesue, A. Ichiki, T. Ichikawa, H. Ito, K. Hasegawa, S. Mizuno, T. Ito, N. Yamada, D. Kano, N. Hara, H. Terazawa, S. Takimoto, K. Watanabe, H. N. Luitel, T. Kajino, Y. Takeda, and K. Higuchi

Category VII. Special Sessions

- System integration, implementation and evaluation
- Privacy & culture concern: the changing trends and relevant technologies
- Persuasive city
- Urbanization: impact and challenges
- Collaboration across companies, governments, universities and different countries
- Entrepreneurship and new investment for new UV technologies

Session VII -1: Lighting, Healthcare and Future Life Conference Room A **Styles**

Chair: Yong Xu (Fujian Agriculture and *Forestry University, China)*

13:00-13:40 Optoelectronic Agriculture - An Innovative Solution to Facility Agriculture Lighting
 Yong Xu, Kaibin Ruan The Trend of Lighting in Future Cities
 Yanyan Peng

Session VII -2: Human Factors Conference Room A Chair: Hirofumi AOKI and Satoshi KI-TAZAKI (Nagoya University, Japan)

14:40-15:40 Estimating Cuffless Blood Pressure using Standardized Features by Pulse Wave Interval under Various Measuring Positions *Hiroki Nishio, Md. Shoaib Bhuiyan, Haruki Kawanaka, Koji Oguri* Effect of a Yellow Filter on Contrast Sensitivity in Elderly Drivers *Makoto Inagami, Hirofumi Aoki, Yasuki Ito, Aiko Iwase, Misako Yamagishi, Takahiro Tanaka, Hiroko Terasaki* Driver's internal state estimation based on the eye movement *Le Anh Son, Hirofumi Aoki, Tatsuya Suzuki, and Goro Obinata*

Session VII -3: Special Session - Persuasive City

Conference Room A

15:50-16:50 Interactive Workshop Chair: Agnis Stibe (MIT, USA)

Presentation of Student Forum

17:15-18:00

Symposion

Closing Ceremony 18:00-18:30

Symposion

Day 3

Technical Tour:	Asuke-district, Toyota-city, Aichi	9:00 - 17:30
Iccnnical Ical.	Asuke-district, Toyota-City, Alem	7.00 - 17.50

Venue: Asuke-district, Toyota-city, Aichi Date & Time: October 8th, 9:00 - 17:30 Start and Finish: ANA Crown Hotel (Kanayama subway station) / Nagoya University

Asuke is famous for the historical townscape built in the latter half of the Edo period (from 1776 to 1830) and natural sights. Nagoya COI and Asuke-district have been working on the project "Building a role-model of exploring mobility for semi-mountainous communities" that aims to build a sustainable society where the elderly spend a vibrant life in semi-mountainous areas without being forced to move to urban areas.

We will visit the implementation site to see "Community Support System" that is an integrated computer/human system to manage the solution set that includes "Mobility Blend" system, information provision for stimulating outings, health condition monitoring and "Mutual Support Promotion Point".

After the project visit, we will join the Asuke festival which is held on the day and experience the traditional hand works, demonstration of matchlock and parades of floats in the town.

(Center of Innovation Program by Ministry of Education, Culture, Sports, Science and Technology)



Committees

General Chairs

Berthold K.P. Horn, MIT, USA Ichiro Masaki, MIT, USA Kazuya Takeda, Nagoya Univ., Japan Zhang Xiong, Beihang Univ., P.R.China

Conference Chairs

Yajun Fang, MIT, USA Yoshiki Ninomiya, Nagoya Univ., Japan

Technology Chairs

Xiaoman Duan, MIT, USA Yasha Yi, Univ. of Michigan, USA Juejun Hu, MIT, USA

Program Chairs

Hao Sheng, Beihang Univ., P.R.China Jing Ma, Harvard Univ., USA Takayuki Morikawa, Nagoya Univ., Japan Chendi Li, Boston Univ., USA Ruitao Wen, MIT, USA Catogory Program Chairs Yousuke Watanabe, Nagoya University, Japan Keigo Takeda, Nagoya University, Japan Akihisa Ichiki, Nagoya University, Japan

Local Chairs

Kenji Mase, Nagoya Univ., Japan Chunzhao Guo, Toyota Central R&D Labs, Japan Victor Muhandiki, Nagoya Univ., Japan

Public Relation Chairs

Sherene M. Aram, MIT, USA Debroah Hodges-Pabon, MIT, USA

Financial Chair

Hiro Aoki, Nagoya Univ., Japan

International Coordination Chairs

Javier Sanchez-Medina, University of Las Palmas de Gran Canaria, Spain Mai Nomura, Central European Univ. Business School, Hungary Ratana Rujiravanit, Chulalongkorn Univ., Thailand Francisco Bozzano-Barnes, Tenure and Ecology LLC, USA

Administrative Chairs

Shigeaki Zaima, Nagoya Univ., Japan Guoping Zhang, Harvard & Nankai Univ., USA Yanyan Li, Sichuan Univ., P.R. China

Conference Secretary

Yohji Suhara, Community Technology Institute, Japan Yuumi Atobe, Nagoya Univ. Kei To, Nagoya Univ., Japan

Media Chairs

Gang Wu, Chinese National Radio, P.R. China Dongxu Shan, Verizon, USA Roger Dejean, End-Tech, USA

Marketing Chair

Benjamin Cheung, Architectural Illusions, USA

Exhibition Chairs

Eiji Ono, Nagoya Univ., Japan Rongduo Liu, China Academy of Telecommunication Research, P.R.China

Publication Chairs

Shoji Suzuki, Fujitsu, Japan Hongyan Cui, MIT, USA

UV Forum Chairs

Michael Chen, MIT, USA Lan Li, MIT, USA Lijuan Su, Harvard Medical School & MGH, USA Lingping Zeng, MIT, USA Yulin Pan, MIT, USA Liang Wang, MIT, USA

Session Chairs

Session I -1A: Intelligent Transportation (1) Toshiyuki YAMAMOTO, Nagoya University, Japan

Session I -1B: Intelligent Transportation (2) Yoshiki NINOMIYA, Nagoya University, Japan

Session I -2: Urban Management Takayuki MORIKAWA, Nagoya University, Japan

Session I -3: Smart Land Use Victor Muhandiki, Nagoya University, Japan

Session II -1: Intelligent Healthcare Masaru HORI, Nagoya University, Japan

Session II -2: Intelligent Life Support Kenji MASE, Nagoya University, Japan Session II -3: Human Robot Interaction Takahiro TANAKA, Nagoya University, Japan

Session III: Intelligent City Hiroto YASUURA, Kyushu University, Japan

Session IV -1: Microbial Technology & Environmental Protection Masaki SHINTANI, Tokyo Women's Medical University, Japan Toru HIGASHINAKAGAWA, Waseda University, Japan

Session IV -2: Smart-City Trash Management and Treatment for Zero-Emission Gene Fry, USA Tingying Zeng, Academy for Advanced Research Institute, USA

Session IV-3: Climate Changes & Future Life Styles Gene R. H. Fry, USA

Session V: Data Management & Visualization Guangtao Xue, Shanghai Jiao Tong University, P.R.China Nengcheng Chen, Wuhan University, P.R.China

Session VI: Intelligent Materials Toru UJIHARA, Nagoya University, Japan

Session VII -1: Lighting, Healthcare and Future Life Styles Yong Xu, Fujian Agriculture and Forestry University, China

Session VII -2: Human Factors Hirofumi AOKI and Satoshi KITAZAKI, Nagoya University, Japan

Session VII -3: Special Session - Persuasive City Agnis Stibe, MIT, USA

Technical Tour Chairs (Asuke Visit)

Chiho Kenmochi, Nagoya Univ., Japan Tomihiro Hayakawa, Asuke Hospital, Japan

Art Designer

Tianli Wang, Rhode Island School of Design, USA

Advisors

Lionel C. Kimerling, MIT, USA Charles G. Sodini, MIT, USA Alberto Broggi, Università di Parma, Italy Yuanli Liu, Harvard University, USA Gang Chen, MIT, USA Theodore D. Moustakas, Boston University, USA Zongguo Xia, Univ. of Massachusetts Boston, USA Jinhua Zhao, MIT, USA Shuguang Zhang, Fei Tao, MIT, USA Ryan C. C. Chin, MIT, USA Guanghui Rong, MIT, USA Nam P. Suh, Professor Emeritus MIT, USA Toshio Fukuda, Meijo University, Japan Lumin Wang, University of Michigan, USA Mohan Trivedi, University of California at San Diego, USA Tim Tianyi Cheng, Vancouver Clean Energy and Advanced Materials Technology (VCEAMT), Canada Minghui Liang, National Institute of Hospital Administration, P.R.China Jianchao Zeng, Taiyuan University of Science and Technology, P.R.China Zhiyong Lan, Renmin University of China, P.R.China Makoto Mizukawa, Shibaura Institute of Technology, Japan Hidekazu Nishimura, Keio University, Japan Yuanchun Shi, Tsinghua University, P.R.China Fei-yue Wang, Chinese Academy of Sciences, P.R.China / IEEE Intelligent Transportation System Society Daniel Zeng, The University of Arizona, USA / IEEE Intelligent Transporation System Society

Assistant Program Chair

Shuo Zhang, MIT, USA

Organization Committee Members

Hitoshi Arima, Dspace, Japan Naohiko Kohtake, Keio Univ., Japan Toshimitsu Hamada, Tsukuba Gakuin Univ., Japan Victor Bi, Canada Shuhang Wang, Harvard Univ., USA Don Naggie, Global Education, USA Gongqin Li, MIT, USA Wei Wu, China Academy of Telecommunication Research, P.R. China Zhilu Zhang, Brandeis Univ., USA Yanyan Peng, Unihero, P.R.China Jie Zhang, San Francisco State Univ., USA

International Program Committee Members

Jaime Alvarez, Monterrey Tec Univ., Mexico Satoshi Naoi, Fujitsu China, Japan Ting Shu, National Institute of Hospital Administration, P.R. China Jingyu Yang, NeuSoft, P.R. China Adrian Ionescu, Nanoelectronic Devices Laboratory, EPFL, Switzerland Chundong Zhou, Digiascend, P.R. China Thomas O. Mensah, Georgia Aerospace Systems, USA

Sponsors & Exhibitors

ASAHI GLASS CO., LTD.

FORUM8 Co., Ltd

FUJITSU LIMITED

Tier IV, Inc.

Toyota Motor Corporation

Japan Transportation Planning Association

Useful Information

Campus Map



Venue: Toyoda Auditorium, Higashiyama campus, Nagoya University **Address:** Furo-cho, Chikusa-ku, Nagoya-shi, Aichi, 464-8601, Japan 3-minute walk from subway station '*Nagoya Daigaku*'.

Access

To Higashiyama Campus, Nagoya University

-From Centrair (Central Japan International Airport): Take the Meitetsu Line to *Kanayama Sta.* (30 min.), then transfer to the Subway Meijyo Line to *Nagoya Daigaku Sta.* (21 min.).

-From Nagoya Station: Take the Subway Higashiyama Line to *Motoyama Sta.* (15 minutes), then transfer to the Subway Meijo Line to *Nagoya Daigaku Sta.* (Higashiyama Campus is just off the subway exit.).

Transportation guide in Nagoya



Banquet

Venue: ANA CROWNE PLAZA Hotel Grand Court NAGOYA
Time: 18:00-20:00, Oct. 6th (Thu.)
Accsess: Subway Meijo Line Nagoya Daigaku Station - Kanayama Station (20mins)





UV 2013 : Humankind in harmony with nature through wise use of technology UV 2014: Innovate Future Life Style for Sustainable Happiness

UV 2016:

Expand our horizon: UV for regions at different developing phases, and for people at different ages, with various technology & culture backgrounds

