# The First International Conference on Universal Village (UV2013)

January 16-17, 2013

Beijing, China



## UV2013, Beijing, China

Humankind in harmony with nature through wise use of technology

**Founding Organizer:** Universal Village Program @ MIT ITRC **Co-organizer:** Tsinghua University (host), Fujitsu R&D Center, Neusoft **Technical sponsor:** IEEE Intelligent Transportation Systems Society (IEEE ITSS)

Sponsor of this program book: Fujitsu(FRDC)

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## Greetings from Founder, General Chair and Program Chair

From Founder, Dr. Ichiro Masaki:



Welcome to the First Universal Village Conference. I am the founder of the conference. My name is Ichiro Masaki. I am the Director of the Intelligent Transportation Research Center at MIT (Massachusetts Institute of Technology).

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, system-oriented 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 lower-level 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. If you have any suggestions to make the conference more useful, please send me an email at <u>masaki@mit.edu</u>.

Please enjoy the conference. Thank you very much!

From General Chair, Professor Berthold K. P. Horn:



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

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.

From Program Chair, Dr. Yajun Fang:



I would like to express my warmest welcome to all attendees to the First International Universal Village Conference, UV2013. I would also extend my sincere thanks to our host, Tsinghua University and all supporters of UV2013 during the conference preparation in the past year.

As you all have known, human being has been making great stride in modern technology. Today it is very common to see "smart" or "intelligent" word added to household items to infrastructure, which reflects people's desire for smartness or intelligence. 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. This new concept is need-based, human-oriented and nature-oriented. A systematic top-down design approach is necessary to in this new paradigm. Modern technology will be wisely used to satisfy the needs from human and nature. It is essential to investigate the integration and dynamic interactions among different components of future development and the dynamic impact of sub-components on the system as a whole. During the process, there will be the development of key intelligent technologies that may bring true intelligence to the future urbanization and the development of UV.

This conference has experts from different fields. Through the conference, new ideas for UV may be born through the interaction among the experts. I hope everyone will enjoy UV2013 and have a good time in Beijing, China.

## Vision, Mission, & Actions of UV Program @ MIT ITRC

**Vision:** human-oriented sustainable community and new life style incorporating the ideal mixture of city and suburban.

**Mission:** use a systematic top-down design approach to improve quality of life and environment.

#### Actions

- Promote a systematic top-down design approach to develop sustainable and harmonious communities between human and nature;
- Explore the key technologies that may bring true intelligence to the future UV and the impact of the new vision on life style, economics, and future society;
- Investigate the integration and dynamic interactions among different subsystems of communities and their dynamic impacts on the whole system;
- Embrace the regional/culture factors and their impacts on regional development paths and key technologies appropriate for different countries/regions.

Intelligent Energy Management	Applications Regional Fa	s & ctors	
Intelligent Healthcare			
Intelligent Transportation Systems			
Intelligent Environment	Infra-structure	Informational Network	New material, device & components
System Integration Da Multi-pla Cross-function Inter-section collabo	ata fusion atform integration a integration ration		System Component

### **Open invitation letter**

This is the call-for-paper to cordially invite you to participate in the first International Conference on Universal Village (UV2013) to be held on January 16-17, 2013 in Beijing. MIT Universal Village Program at Intelligent Transportation Research Center (MIT ITRC) is the founding organizer of the conference. We are collaborating with Tsinghua University and Fujitsu Research Center in China to co-host the conference at Tsinghua University in Beijing. IEEE Intelligent Transportation Systems Society (IEEE ITSS) is the technical co-sponsor of the conference. Details of the conference are available at <u>www.universal-village.org</u>.

The "Universal Village" represents our vision for the future society, and comprises the following aspects: multi-functional multi-format communities and a new life style incorporating the ideal mixture of city and suburban areas. The new vision demands a systematic top-down design approach to provide practical solutions to challenges arising from current urbanization trends and to improve the quality of life using modern technologies.

The conference will explore technologies that may bring true intelligence to the Universal Village as well as its major subsystems, including intelligent health care, intelligent transportation, intelligent environment, intelligent energy management and protection of the environment. The conference will address not only the design, development, implementation and engineering of the whole system and its intelligent subsystems, but also the technical details on infrastructure layer, informational layer and new materials, etc. The conference will focus on promoting the research on the integration and dynamic interactions among different components of urbanization and the dynamic impact of subcomponents on the system as a whole. Furthermore, the conference will discuss how to effectively collaborate among different research fields and among different organizations including government, academic and industries. The conference will elaborate the regional and culture factors as well as their impacts on the choices of regional development paths and the key technologies appropriate for different countries and regions, and venues of potential international collaboration. Besides these technical aspects, the conference covers the human and social aspects of the Universal Village, the impact of the new vision on life style, economics, and future society.

Please submit your paper to universal.village.submit@gmail.com. Should you be interested in organizing a Special Session UV2013 in Beijing, please contact us at universal.village.conf@gmail.com. Please kindly be aware that there is no financial support provided for our invitees. All participants are required to register for the conference.

We very much look forward to seeing you in Beijing, 2013!

With our best regards,

Professor Berthold K. P. Horn, General Chair of UV 2013 Dr. Ichiro Masaki, Founding Chair of UV 2013 Dr.Yajun Fang, Program Chair of UV 2013 <u>universal.village.conf@gmail.com</u>

## UV2013 Suggested Topics

Systems, Applications & Regional Factors	Components & System Integration
Subsystems of the Universal Village	Hierarchical Layers &
<ul> <li>Intelligent Environment</li> <li>Smart commercial and residential complexes, smart villages, smart communities, etc., focusing on:</li> <li>Intelligent security monitoring</li> <li>Intelligent information distribution &amp; services</li> </ul>	<ul> <li>Components</li> <li>➢ Infrastructure Layer         <ul> <li>○ Intelligent sensor &amp; communication network</li> <li>○ Cloud and mobile computing</li> </ul> </li> </ul>
<ul> <li>Intelligent Transportation</li> <li>Intelligent technologies to enhance safety, efficiency &amp; convenience</li> <li>Environmental friendly vehicles and other new emerging</li> </ul>	<ul> <li>Event-driven data compression &amp; storage</li> <li>New materials, devices &amp; components</li> </ul>
<ul> <li>Vehicles</li> <li>Intelligent Healthcare         <ul> <li>Intelligent &amp; distributed hospitals, recuperation centers, intelligent senior houses, focusing on:</li> <li>Intelligent hospital administration &amp; management technologies</li> <li>Intelligent healthcare monitoring &amp; prediction</li> <li>Tele-medicine &amp; assistive technologies</li> </ul> </li> </ul>	<ul> <li>Informational Layer</li> <li>Multi-platform information retrieval &amp; visualization, data sharing &amp; data integration, data fusion &amp; data mining (across TV net, mobile net, Internet)</li> <li>Smart response systems for emergency and accidents</li> </ul>
<ul> <li>Mobile-health and intelligent ambulance technologies</li> <li>Intelligent Energy Management &amp; Environment Protection</li> <li>Intelligent adaptation based on human activities, health status, and weather conditions for buildings, community, or environment</li> </ul>	<ul> <li>System Implementation</li> <li>Technical         <ul> <li>Dynamic impact of subsystem implementation</li> <li>Large complex system theories</li> </ul> </li> <li>Social</li> </ul>
<ul> <li>Interaction and Integration of Subsystems         <ul> <li>Interaction &amp; mutual impact between the whole system and its subsystems</li> <li>Interaction &amp; mutual impact among subsystems</li> <li>Integration of subsystems and the design of the whole system</li> </ul> </li> </ul>	<ul> <li>Cultural and political factors</li> <li>Impact on future life style and society</li> <li>Inter-entity &amp; international collaboration such as, collaboration among different government organizations,</li> </ul>
<ul> <li>Regional Factors and Future Directions</li> <li>Impact of regional factors on the system design</li> <li>Future research directions based on the demand of the whole system</li> </ul>	different companies, and different universities

## Program at a glance

#### Day 1: Jan.16. 2013

*Morning* 8:00 am – 12:00 pm

- On-site Registration 8:00 am 9:00 am
- Opening Ceremony 9:00 am 10:30 am
- Tea Break 10:30 am 10:45 am
- Special Session: Universal Village, What, Why, How? 10:45 am –12:00 pm

*Lunch* 12:00 pm – 12:45 am

*Afternoon* 12:45 pm – 6:00 pm

- Session A: Intelligent Healthcare 12:45 pm 2:45 pm
- Tea Break 2:45 pm 3:00 pm
- Special session: Smart City Projects in China 3:00 pm 4:00 pm
- Special session: Smart City Projects in Japan 4:00 pm 6:00 pm

Conference Dinner Banquet 7:00 pm - 10:00 pm

#### Day 2: Jan.17, 2013

*Morning* 8:15 am – 12:30 pm

- Session B: Intelligent Environment 8:15 am 11:00 am
- Tea Break 11:00 am 11:15 am
- Special session: Distributed Intelligence, Intelligent Energy Management & Environmental Protection 11:15 am 12:30 pm

*Lunch* 12:30 pm – 1:30 pm

*Afternoon* 1:30 pm – 5:30 pm

- Session C: Intelligent Transportation 1:30 pm 3:00 pm
- Tea Break 3:00 pm 3:15 pm
- Panel Discussion: The Trend of Intelligent Technology & Global Comparison of Smart City Projects 3:15 pm – 4:30 pm
- Closing Ceremony 4:30 pm 5:30 pm

## Program with paper titles

Day 1: Jan.16, 2013

*Morning* 8:00 am - 12:00 pm

- **On-site registration** 8:00 am 9:00 am
- **Opening Ceremony** 9:00 am 10:30 am
  - 1. Several short speeches from conference organizers, ITSS representative and sponsors.
  - 2. (invited talk) Zhang Xiong: Smart city projects in China.
- Tea Break 10:30 am 10:45 am
- Special session: Universal Village, What, Why, How? 10:45 am 12:00 pm
  - 3. Yajun Fang, Berthold K.P. Horn, Ichiro Masaki: *Universal Village What? Why? How?*
  - 4. Rajalakshmi Balakrishnan, Albert Braun, Ajay Chander, Shreyans Gandhi, Alex Gilman, Jawahar Jain, Yasunori Kimura, Dave Marvit, Daiki Masumoto, Stergios Stergiou: *A Day in the Life in the Universal Village Applications of a General Platform for Continuous Mobile Monitoring.*
  - 5. Yi-Je Lim, Robert Hsiung, Jienan Ding, Yifu Gao, John Hu: Intelligent Robotic Nursing Assistants for Universal Village Heathcare Services.

*Lunch* 12:00 pm – 12:45 pm

*Afternoon* 12:45 pm – 6:00 pm

- Session A: Intelligent Healthcare 12:45 pm 2:45 pm
  - 1. (invited talk) Minghui Liang: *Evaluating EHR Adoption in China Using a National EHR Functional Grading Model.*
  - 2. Qingliang Miao, Yao Meng, Shu Zhang, Hao Yu: *Mining and Publishing Chinese Nutritional Knowledge as Linked Data on the Web.*
  - 3. Hanbing Deng, Xia Zhang, Jiren Liu: *Knowledge based Intelligent Healthcare Service*.
  - 4. Chundong Zhou: Intelligent Medical Platform Innovation Based on the Health Profile.
  - 5. Zhaohua Deng, Zhanchun Feng: *Examining the Determinants of Mobile Health Service Adoption: From the Perspective of Public Users.*
- Tea Break 2:45 pm 3:00 pm
- Special session: Smart City Projects in China 3:00 pm 4:00 pm

- 1. (invited talk) Zhiyong Lan: *Key Technologies and Systems for Building Smart Cities in China*.
- 2. (invited talk,tentative) Yuanchun Shi, Yongqiang Lyu:
- 3. Ying Zhi Li: The Research on Government Intelligence Decision Based on the Information Technology
- 4. Yu Hu: The Current Development of Building a Smarter City at Wuhan.
- Special session: Smart City Projects in Japan 4:00 pm 6:00 pm
  - 1. (keynote talk) Hitoshi Arima: Yokohama Smart Community -in efforts to develop Smart Energy System that for sustainable future communities-.
  - 2. (keynote talk, tentative talk) Ken-ichi Sakagoshi: Smart City Project.
  - 3. Tasuku Imanishi, Junya Nishiguchi, Tomohiro Konda, Ryota Dazai, Chosei Kaseda: *Building Energy Savings via SaaS/ASP utilizing Data Modeling.*
  - 4. Jaime Alvarez, Nishimura Hidekazu: A Socio-cultural Approach for the Local Scale of Urban Transport.
  - 5. Naohiko Kohtake, Yuki Takahashi: System Design and Management for Edge City in Tokyo.

Conference Dinner Banquet (Wenjin Hotel, <u>www.wenjin.com.cn</u>) 7:00 pm – 10:00 pm

Day 2: Jan.17, 2013

*Morning* 8:15 am – 12:30 pm

- Session B: Intelligent Environment 8:15 am 11:00 am
  - 1. Jun Wang, Cole Shaw, Richard Larson, Kanji Uchino: *Simulation Model of Learning Recommendation in Guided Learning Pathways.*
  - 2. Siamak Faridani, Taylor Berg-Kirkpatrick, Ken Goldberg, Jun Wang, Kanji Uchino: *Online Opinion Analysis based on Canonical Correlation Analysis.*
  - 3. Hua Yang, Chaoliang Zhong, Gang Zou, Bingfeng Pi, Jun Zhang, Matsuo Akihiko: *Personalized Service Recommendation for SaaS Portal.*
  - 4. Atsushi Kubota, Yasuhiko Kanemasa, Hirokazu Iwakura, Junichi Higuchi, Masazumi Matsubara, Toshinori Arai, Susumu Nakadate, Hiroshi Kanou: *Install a Signal Light on Your Enterprise Computer System: Normality Diagnosis of n*-*Tier Systems.*
  - 5. Ruimin Hu, Junjun Jiang, Xiaohui Dong, Zhen Han, Wenyi Hu: *Low-Resolution and Low-Quality Face Hallucination in Monitoring Scene via Weighted Sparse Representation*.
  - 6. Qingming Leng, Ruimin Hu, Wenyi Hu: *A hierarchical and user-driven intelligent surveillance video investigation system.*
  - 7. Ahmed R. Elsherif, Wei-Peng Chen, Akira Ito, Zhi Ding: *Revenue Maximization of Mobile Network Operators Using Dual-Band Small Cells.*
  - 8. Fanxi Yan, Yongqiang Lu, Dan Wang, Yu Chen, Yuanchun Shi, Nazim Agoulmine: A High-Performance Plug-and-Play Gateway for Cloud-Sensor Systems.
- Tea Break: 11:00 am 11:15 am

- Special session: Distributed Intelligence, Intelligent Energy Management & Environmental Protection 11:15 am – 12:30 pm
  - 1. Gangzhu Qiao, Chunfu Hu, Jianchao Zeng: *Artificial Neural Network Based Aided Localization Method for Wireless Sensor Network.*
  - 2. Guo-you Zhang, Jian-chao Zeng: *Research on Task Allocation Based on Wasp Swarm algorithm in Environmental monitoring.*
  - 3. Songdong Xue, Jianchao Zeng, Guoyou Zhang, and Zhibin Xue: Coordination Method for Swarm Robotic Search in Natural Disasters and Accidents.
  - 4. Jing Zhao, Jian-chao Zeng: Voronoi Diagram based Coverage Algorithm for Wireless Sensor Network.

*Lunch* 12:30 pm – 1:30 pm

*Afternoon* 1:30 pm – 5:30 pm

- Session C: Intelligent Transportation 1:30 pm 3:00 pm
  - 1. (invited talk) Feiyue Wang: *Parallel Control and Management of Urban Transportation Systems.*
  - 2. Xianghui Bai, Bingrong Wang, Huanyu Wang, Zhiming Tan, and Akihiro Higashi: High Accuracy Distance Measurement System with Stereo Fisheye Cameras.
  - 3. Xiang Zhang: Intelligent Vehicle is one of the future trends for the Universal Village.
  - 4. Shanren Nie, Xia Zhang, LiJun Zhao, Qian Zhang, QiZhen Pei: A Relay-Based In-vehicle Internet Connecting System.
  - 5. Anping Han: Intelligent Control Platform Used in China High Speed Railway.
- **Tea Break** 3:00 pm 3:15 pm
- Panel Discussion: The Trend of Intelligent Technology & Global Comparison of Smart City Projects 3:15 pm – 4:30 pm
- Closing Ceremony 4:30 pm 5:30 pm

## Logistics

Conference language:

English/Chinese. Real-time Chinese/English translation is provided.

Conference Site:

Room 301, Bld.A, Academy of Fine Arts Tsinghua University

Conference dinner banquet site: Wenjin Hotel (www.wenjin.com.cn)

#### Publication:

Papers that have been accepted will be included into the IEEE Conference Proceedings published by the IEEE Intelligent Transportation Systems Society. Distinguished papers presented in UV2013, after further extensions, will be published in special issues through IEEE Intelligent Transportation Systems Society.

#### Presentation Guidance for Authors:

UV2013 is providing the opportunity for all authors to present their papers in both oral and poster format at no extra cost. So you are invited to prepare and display your posters in our exhibition room during the full conference period. In other words, the display is not limited in the session of your oral presentation, and conference attendees can visit your posters at any time during the two-day conference. The poster size is 2x3 feet or 60.96cm x 91.44cm.

#### Authors' Registration:

Authors of accepted papers (or at least one of the authors) are expected to register and present their work at the conference. Please notice that the registration is not completed until the registration fee is paid.

Registration Date	Registration Fee	
	Professional	Student
Before Dec.2,2012	\$699.00	\$399.00
Dec.3 - Dec.15, 2012	\$749.00	\$449.00
After Dec.16, 2012	\$849.00	\$549.00

#### Group Registration

We will offer special group registration rates (the same rate for student registration) if three or more co-authors register together.

### Paper abstracts

Day 1: Jan.16, 2013

#### Morning 8:00 am – 12:00 pm

- Conference on-site registration 8:00 am 9:00 am
- **Opening Ceremony** 9:00 am 10:30 am
  - 1. Several short speeches from conference organizers, ITSS representative and sponsors.
  - 2. (invited talk) Zhang Xiong: Smart city projects in China

Professor, Beihang University, China,

<u>Abstract:</u> Driven by factors such as the cloud computing, Internet of things, big data and e-City, the smart city is have attracted a large amount of attention in governments, the academia and the industry. This talk gives a discussion about the Smart City projects in China for three aspects: 1) giving a deepgoing analysis of challenge in the urbanization process in China and existing Urban informatization projects. 2) introducing some emerging concepts in China Smart City development, including Data Vitalization, Internet of Data. 3) giving a introduction of the Smart City projects in China and its progress. The talk covers recent ideas and works of the speaker and the research group of the Smart City National 863 Key Project of China.

Keywords:

- Tea Break 10:30 am 10:45 am
- Special session: Universal Village, What, Why, How? 10:45 am 12:00 pm
  - 1. Yajun Fang, Berthold K.P. Horn, Ichiro Masaki: *Universal Village What? Why? How?*

MIT, USA

<u>Abstract:</u> The current society is facing serious challenges due to fast urbanization, limited resources and increasing population of senior citizens. The concept of smart cities has been widely adopted in order to address the problems. However, many current designs are availability-based, techniqueoriented, and bottom-up scheme which focuses on separated elements. In contrast, we propose our vision for future society and community development, "Universal Village," a need-based human-nature-oriented top-down systematic design scheme. It is multi-functional multi-format communities and a new life style incorporating the ideal mixture of city and suburban areas, which provides practical solutions and improves quality of life using intelligent technologies. <u>Keywords:</u> Universal Village, Smart City, Intelligent Healthcare, Intelligent Transportation Systems, Intelligent Environment, Top-down Design

2. Rajalakshmi Balakrishnan, Albert Braun, Ajay Chander, Shreyans Gandhi, Alex Gilman, Jawahar Jain, Yasunori Kimura, Dave Marvit, Daiki Masumoto, Stergios Stergiou: *A Day in the Life in the Universal Village - Applications of a General Platform for Continuous Mobile Monitoring.* 

Data Driven Health Care, Fujitsu Labs of America, Sunnyvale, CA/USA

<u>Abstract:</u> The universal village can be characterized by the ubiquity of sensors and connected infrastructure which enable intelligent services that improve the quality of our lives. In this paper, we describe various novel services built atop a general purpose mobile platform for continuous mobile monitoring. Our platform was developed with next-generation healthcare services in mind, but has applicability more broadly as a platform for deploying real-time services that utilize data coming from arbitrary sensors. We provide an overview of our platform, and highlight a few services that act as new touchpoints between a user and the universal village infrastructure. We thread these services through a prototypical day and describe how they serve to define a new normal for quality of life in the universal village.

<u>Keywords:</u> mobile platform; continuous sensing; services; healthcare; remote monitoring; stress

3. Yi-Je Lim, Robert Hsiung, Jienan Ding, Yifu Gao\*, John Hu: *Intelligent Robotic Nursing Assistants for Universal Village Heathcare Services.* 

Hstar Technologies Co., Cambridge, MA 02138, USA \*Handy Robotics Technologies Inc., Changzhou, China

Abstract: Industrial robotic systems are often constrained in a protected area without human accessibility. However, in a human living or servicing environment such as an intelligent universal village, the human service robotic system should be able to move around and co-exist in a human world, and interact with human and perhaps assist and collaborate with human users. This paper introduces a novel area of humanoid service robotic research targeted in healthcare assistive robot -robotic nurse assistant (RoNA) system. Hstar Technologies has been developing its flagship product, RoNA system, to enhance the efficacy and quality of care that nurses and their paraprofessional staff can provide. RoNA is a safe and robust system that works effectively in a hospital environment or senior houses of a universal village under direct and telepresence control by a nurse or physician. We anticipate that robotic nurse assistants would increase quality of care, reduce lifting-related injuries, and extend the years of effective service nurses could render in hospitals, medical centers and senior houses. These effects would reduce healthcare costs and ameliorate problems posed by the shortage of nursing staff.

<u>Keywords:</u> Robotic Nurse Assistant, Human Safe Actuation, Omni-directional Mobile Platform, Telepresence Control, Humanrobot Interaction

#### Afternoon 12:45 pm – 6:00 pm

- Session A: Intelligent Healthcare 12:45 pm 2:45 pm
  - 1. (invited talk) Minghui Liang: Evaluating EHR Adoption in China Using a National EHR Functional Grading Model

Director, National Institute of Hospital Administration, Ministry of Health of the P.R.China, China

<u>Abstract:</u> Electronic health records (EHRs) have the potential to improve hospital efficiency and effectiveness. Studies have reported the state of Health Information Technology (HIT) adoption and use in several industrialized nations, including some Asian countries. However, there are no reliable estimates of the prevalence of EHR use in Chinese hospitals. To assess Chinese national electronic health record (EHR) adoption in Chinese hospitals, we investigated 905 hospitals from 30 provinces in China using a standard Model of HER Grading (MEG). We compared the grading results from different aspects as hospital types and regions, using PLS regression-based techniques to assess the effects of hospital type and regional concentration on MEG level, adjusting for hospital volume, income and other operational variables. Obviously, the EHR adoption is still in the early, unbalanced stages of growth in China. A nationwide strategy that focuses more on policy incentives, financial support, and educational programs is important for the future EHR development in China.

Keywords:

2. Qingliang Miao, Yao Meng, Shu Zhang, Hao Yu: *Mining and Publishing Chinese Nutritional Knowledge as Linked Data on the Web.* 

Fujitsu R&D Center Co., Ltd, Beijing, China

<u>Abstract:</u> The development of modern health care and clinical practice increases the need of nutritional and medical data integration across heterogeneous resources. In this paper, we investigate how to automatically discover Chinese nutritional knowledge from unstructured text and integrate with medical data in the form of Linked Data. In particular, we first mine food, ingredient, disease entities and their relationships from Chinese medical text. And then, we translate these entities and relationships into English, and transform them into RDF data according to an extended biomedical ontology. Finally, we discovery semantic links between food, ingredient, disease entities and other semantic related resources in the Linked Data Cloud.

Keywords: Nutritional knowledge mining, linked data.

3. Hanbing Deng<sup>1</sup>, Xia Zhang<sup>1,2</sup>, Jiren Liu<sup>1</sup>: *Knowledge based Intelligent Healthcare Service*.

College of Information Science and Engineering Northeastern University<sup>1</sup>, Shenyang, China

State Key Laboratory of Software Architecture Neusoft Incorporated Company<sup>2</sup>, Shenyang, China

<u>Abstract:</u> With the trend of society aging, the problem of shortage of medical resources is becoming more and more obviously. Traditional method cannot meet the needs of exponential growth of healthcare requirement. Today, with the high-speed developing of the network, service and smart technology, healthcare service is no longer limited to the traditional way. Based on the existing health knowledge, how to make the computer realize autonomous and intelligent health care service becomes the main direction of the research. With the thought model, Agent technology gives a viable way to achieve this goal. Different agents can form different thought model base on the knowledge of health care. And the agents with different thought model can realize different types of health care services. This kind of agents can autonomous provides services in the network to the people with health requirements. This paper proposed an ontology-based thought model. With this model, we can transform the health knowledge into the brief, desire and intention of the agents. And the intelligent agents with thought model can realize the autonomous process of health care services.

Keywords: Agent; ontology; BDI model; healthcare service

4. Chundong Zhou: Intelligent Medical Platform Innovation Based on the Health Profile.

WUXI ASCEND MEDICAL EQUIPMENT CO., LTD, China

<u>Abstract:</u> At present, as the pressure of survival in the society is leaping and the living environment is deteriorating, people always stay in an unhealthy life condition. People always go to hospital when there is something wrong with their body, that is why people cannot cure disease in time and be well adapted to the modern life development requirements. Through the thorough system research of people's real needs, medical workflow and medical products, we try to provide a system-integrated intelligent medical platform from the perspective of preventive medicine. It has compact structure and horizontal management system, which improves the medical convenience, broadens the scope and be much safe.

Keywords: health profile, workstation, intelligent analysis.

5. Zhaohua Deng, Zhanchun Feng: *Examining the Determinants of Mobile Health Service Adoption: From the Perspective of Public Users.* 

School of medicine and health management, Huazhong University of Sci. & Tech., Wuhan, China

<u>Abstract:</u> The universal application of mobile communication technology, as well as the great demand of information based medical health services, has facilitated the rapid development of mobile health in China. As current concerns arise over public's health, mobile health is attracting the attention of more and more people. Although previous studies on the adoption of mobile services are quite extensive, few focus on public users' adoption of mobile health service. In this study, we examine the determinants of user adoption of MHS based on Technology acceptance model (TAM). The findings confirm that perceived usefulness positively affect users' attitude toward MHS, perceived service availability significantly impact on perceived ease of use and perceived usefulness, perceived usefulness and attitude directly enhance intention.

<u>Keywords:</u> mobile health service, Technology Acceptance Model, service availability.

- Tea Break 2:45 pm 3:00 pm
- Special session: Smart City Projects in China 3:00 pm 4:00 pm
  - 1. (invited talk) Zhiyong Lan: *Key Technologies and Systems for Building Smart Cities in China*.

Professor and Associated Dean, School of Public Administration and Policy, Renmin University of China, China

<u>Abstract:</u> Smart City, (or rather, Intelligent City), is a concept first advanced by IBM, and later developed by various scholars and visionaries. It involves the use of information technology to resolve issues related to the management of infrastructure, public services, public security, environmental protection, communication, transportation, and production activities. It is an effort integrating the material world with the virtual world by way of information technology so that the livelihood of the urban dwellers could be greatly and intelligently improved. This presentation shall discuss the key technologies and urban systems that could enable this possibility.

Keywords:

2. (invited talk, tentative) Yuanchun Shi, Yongqiang Lyu:

Tsinghua University, China

3. Ying Zhi Li: *The Research on Government Intelligence Decision Based on the Information Technology* Electronic Decision Theatre, College of Public Administration, Huazhong University of Science and Technology, Wuhan, Hubei, China

<u>Abstract:</u> Through the analysis of the decision-making process the paper deduced the three elements of decision making and two necessary conditions of the realization of scientific decision-making, what just is the foundation of wisdom government decision-making. Based on modern information technology developed green building management decision system, which achieve the management decision, professional decision and public decision respectively according to different requirements. Finally put forward the technology needs further research direction. And come to the conclusion that today's information technology can provide information management means the artificial unable to realize, and at the same time, still can use computer calculation provide complex decision algorithm is presented, which can change the empirical decision to the scientific decision-making.

<u>Keywords:</u> information technology, the government wisdom decision, green building management.

4. Yu Hu<sup>1,2</sup>: *The Current Development of Building a Smarter City at Wuhan.* 

<sup>1</sup>School of Optical and Electronic Information, Huazhong University of Science and Technology, Hubei, Wuhan, China 430000 <sup>2</sup>Wuhan Research Institute for Smarter Cities, Floor 18, Building F5, Software Park of Optical Valley, Hubei, Wuhan, China 430000

<u>Abstract:</u> Wuhan is one of the largest cities at the central China, and it has been elected as one of the pilot cities for smarter cities of China. In August 2012, the Wuhan city government published the top-level planning of building a smarter city for Wuhan in the next eight years. In this paper, we present the overall idea of the planning and the current development efforts of building a smarter city at Wuhan. We will also discuss the challenges we have been facing during the course of building a smarter city at Wuhan. We hope to use Wuhan as a concrete example to show the status for building smarter cities in China.

Keywords:

- Special session: Smart City Projects in Japan 4:00 pm 6:00 pm
  - 1. (keynote talk) Hitoshi Arima: Yokohama Smart Community -in efforts to develop Smart Energy System that for sustainable future communities-.

President, dSPACE Japan K.K./Chairman of Yokohama Smart Community, Japan

2. (keynote talk) Ken-ichi Sakagoshi: Smart City Project.

Director of Smart City Div., Smart City Div., e -Solutions, Inc., Japan

3. Tasuku Imanishi, Junya Nishiguchi, Tomohiro Konda, Ryota Dazai, Chosei Kaseda: *Building Energy Savings via SaaS/ASP utilizing Data Modeling.* 

Azbil Corporation, Kanagawa, Japan

<u>Abstract:</u> In recent years reduction of building energy is strongly desired due to the global economic growth and the increase in energy consumption. While performance of the building air-conditioning facilities improved, introducing and maintaining them require a lot of cost and effort. This paper proposes a building energy savings service via SaaS/ASP that enables building owners to install the service instantly, easily and economically. The service provides energy savings functions by connecting remote server with buildings. The functions use data modeling for constructing energy usage behavior of buildings. In addition, we denote the structure of the service and the details of the functions, and validate their energy savings capability.

<u>Keywords:</u> Data model, optimal control, on-line learning, energy savings, energy prediction

4. Jaime Alvarez, Nishimura Hidekazu: A Socio-cultural Approach for the Local Scale of Urban Transport.

Graduate School of Systems Design and Management, Keio University, Yokohama, Japan

<u>Abstract:</u> Although ITS applications and technologies have become available to urban communities transport providers, their implementation focuses mainly on making trips more efficient, clean, safe and seamless. This paper argues that addressing transportation for local urban communities requires paying attention to community socio-cultural issues, in order to envision transportation solutions that facilitate community social interaction. Having this in mind, this paper introduces a socio-cultural approach to community transportation that provides theoretical and methodological tools for acquiring a comprehensive understanding of the community socio-cultural context, aiming to support generation of innovative transportation systems that contribute to revitalization of urban communities. The paper first briefly points out the importance of community social interaction. It then explains the theoretical and methodological main parts of the approach. The final part of the paper discusses opportunities for ITS systems to promote community social interaction and draws conclusions that summarize the paper.

<u>Keywords:</u> Community transportation, socio-cultural approach, urban community, well-being, social interaction, Intelligent Transport Systems.

5. Naohiko Kohtake<sup>1,2</sup>, Yuki Takahashi<sup>1</sup>: System Design and Management for *Edge City in Tokyo*.

<sup>1</sup>Graduate School of Systems Design and Management, Keio University, Yokohama, Japan <sup>2</sup>Creative City Consortium

<u>Abstract</u>: The purpose of this research is to establish a method to design and manage effective and more efficient edge citys in increasing in the world. This paper describes the analysis of issues of Futako Tamagawa City, one of in Tokyo and report several activities to solve problems with social and technical approaches.

<u>Keywords:</u> Edge City; Energy; Congestion; Positioning; Mapping; Social Capital; Informatization; Collective Intelligence.

Conference Dinner Banquet (Wenjin Hotel, <u>www.wenjin.com.cn</u>) 7:00 pm – 10:00 pm

Day 2: Jan.17, 2013

#### Morning 8:15 am – 12:30 pm

- Session B: Intelligent Environment 8:15 am 11:00 am
  - 1. Jun Wang<sup>1</sup>, Cole Shaw<sup>2</sup>, Richard Larson<sup>2</sup>, Kanji Uchino<sup>1</sup>: *Simulation Model of Learning Recommendation in Guided Learning Pathways.*

<sup>1</sup>Fujitsu Laboratories of America, Inc., USA <sup>2</sup>Massachusetts Institute of Technology, USA

<u>Abstract:</u> MIT and Fujitsu initiate a project for creating an advanced online learning environment, Guided Learning Pathways (GLP), which is trying to provide uniquely personalized guidance to learners and in turn can help them maximize their individual rate of learning. Efficient and effective pedagogy oriented recommendation mechanisms are critical for delivering optimized guidance on learning pathways and materials in GLP. In this paper, we present a novel simulation model integrated with advanced learner models for exploring various recommendation mechanisms used for GLP. Our experimental results show that simulation studies can flexibly and feasibly support the analysis and optimization of learning recommendation algorithms. This simulation study confirms that recommendation algorithms with implicit ratings and warm-up processes lead towards more effective and faster learning goal achievement.

Keywords:

2. Siamak Faridani<sup>1</sup>, Taylor Berg-Kirkpatrick<sup>1</sup>, Ken Goldberg<sup>1</sup>, Jun Wang<sup>2</sup>, Kanji Uchino<sup>2</sup>: *Online Opinion Analysis based on Canonical Correlation Analysis.* 

<sup>1</sup>University of California, Berkeley, USA <sup>2</sup>Fujitsu Laboratories of America, Inc., USA

Abstract: Creating technologies that find and analyze online opinions is becoming key for many important applications. In this paper, we propose new approaches for opinion mining and recommendation based on Canonical Correlation Analysis (CCA). We first present the theoretical background for CCA and highlight its probabilistic interpretation. We then demonstrate two applications of this model for opinion mining systems. And we show the properties of the model on data from two different domains, online deliberation systems and e-commerce. In the first application, we use CCA as an effective dimensionality reduction procedure for cases that textual reviews are accompanied by multivariate numerical ratings. The CCA model along with a Nearest Neighbor algorithm is used to build an opinion recommender system for discovering insightful and valuable opinions from massive opinion pools. Our experimental results on two datasets from the US Department of State and a major car manufacturer demonstrate the effectiveness of our CCA method over the baseline for this application. In the second application, we propose a supervised regression learning model using a modified form of Canonical Correlation Analysis for automatically mining multi-aspect numerical ratings from textual reviews. We show that the algorithm outperforms other conventional models based on a dataset collected from an online retailer.

#### Keywords:

3. Hua Yang<sup>1</sup>, Chaoliang Zhong<sup>2</sup>, Gang Zou<sup>1</sup>, Bingfeng Pi<sup>1</sup>, Jun Zhang<sup>2</sup>, Matsuo Akihiko<sup>3</sup>: *Personalized Service Recommendation for SaaS Portal.* 

<sup>1</sup>Information Technology Laboratory, Fujitsu Research and Development Center, Su Zhou, China

<sup>2</sup>Information Technology Laboratory, Fujitsu Research and Development Center, Beijing, China

<sup>3</sup>Software Systems Laboratories, Fujitsu Laboratories Ltd., Kawasaki, Japan

Abstract: With the development of the cloud computing, more and more online rental platforms appear, via which service providers offer software as service, to Medium and Small Enterprises (MSE). This kind of service delivery model is known as Software as a Service (SaaS), and the portals of the online rental platforms are named SaaS Portals. As more and more services are released on the SaaS Portals, it is difficult for MSE to find and select demanded and suitable services from a huge amount of services. Facing this challenge, a Personalized Service Recommender on SaaS Portal (PSR-SSP) is introduced. First, because SaaS Portal is for MSE, this PSR-SSP uses extended Register Information as a feature to capture the latest information of MSE. Such extended information reflects the MSE's requirements. Second, this paper uses Browsing History to extract Service Sequence, which solves the problem of data sparseness, and brings about a higher precision value. Furthermore, the PSR-SSP recommends services based on the similar services and similar MSE method, which can not only recommend the demanded services, but also recommends the potential services that the user will demanded. Experimental results show that our method outperformed traditional method.

Keywords: SaaS Portal, Web Service, Service Recommendation.

4. Atsushi Kubota<sup>1</sup>, Yasuhiko Kanemasa<sup>1</sup>, Hirokazu Iwakura<sup>1</sup>, Junichi Higuchi<sup>1</sup>, Masazumi Matsubara<sup>1</sup>, Toshinori Arai<sup>2</sup>, Susumu Nakadate<sup>2</sup>, Hiroshi Kanou<sup>2</sup>: *Install a Signal Light on Your Enterprise Computer System: Normality Diagnosis of n-Tier Systems.* 

<sup>1</sup>Junichi Higuchi, Masazumi Matsubara, Cloud Computing Research Center, FUJITSU LABORATORIES LTD., Kawasaki, Japan <sup>2</sup>Information Network Security Services Division, FUJITSU FSAS INC., Kawasaki, Japan

<u>Abstract:</u> As infrastructures of intelligent society, enterprise computer systems in data centers have been improving their importance. To help operators monitor performance of such multi-tier computer systems, we developed a novel normality diagnosis method. It dynamically changes the upper limit of response time accepted as adequate performance according to the amount of instantaneous load. Its another distinctive feature is to eliminate unnecessary alerts caused by dependences between tasks distributed among tiers. Together with the two features, the diagnosis method can illuminate the location of performance problems clearly like a signal light. Two types of models representing usual behavior of a system are involved to achieve the features, which are automatically generated from transaction messages exchanged in the system. The experimental evaluation shows the calling relationship modeling can capture caller-callee relationships between tasks in different tiers with up to a recall of 0.91 under some conditions.

<u>Keywords:</u> N-tier system; Performance evaluation; Normality; Operator; Reliability

5. Ruimin Hu<sup>1</sup>, Junjun Jiang<sup>1</sup>, Xiaohui Dong<sup>1</sup>, Zhen Han<sup>1</sup>, Wenyi Hu<sup>2</sup>: *Low-Resolution and Low-Quality Face Hallucination in Monitoring Scene via Weighted Sparse Representation*.

<sup>1</sup>National Engineering Research Center for Multimedia Software, School of Computer, Wuhan University, Wuhan, 430072, China <sup>2</sup>The University of Sheffield, Mappin Street, Sheffield, S1 3JD, United Kingdom

<u>Abstract:</u> Monitoring cameras are now widely used to monitor everything from a room in a house to an entire warehouse. However, in real monitoring scenarios, a variety of factors, such as underexposure, optical blurring, defocusing, have an impact on the quality of images, which leads to low-quality and low-resolution of the individual of interest. Given a low-resolution face image, for the local patch based method, the key issue of these methods is how to encode the input low-resolution image patch. In this paper, we present a novel sparse coding method via exploiting the support information on the coding coefficients to induce a high-resolution face image from a low-resolution observation. According to the distances between the input patch and bases in the dictionary, we first assign different weights to the coding coefficients and then obtain the coding coefficients by solving a weighted sparse problem. Experiments on commonly used database (CAS-PEAL-R1) and some real monitoring camera condition demonstrate that our method outperforms state of the art.

<u>Keywords:</u> Intelligent security monitoring; face image; super-resolution; hallucination; sparse coding.

6. Qingming Leng<sup>1</sup>, Ruimin Hu<sup>1</sup>, Wenyi Hu<sup>2</sup>: *A hierarchical and user-driven intelligent surveillance video investigation system.* 

<sup>1</sup>National Engineering Research Center for Multimedia, Software, School of Computer, Wuhan University, Wuhan, 430072, China <sup>2</sup>The University of Sheffield, Mappin Street, Sheffield, S1 3JD, United Kingdom

Abstract: With the rapid expansion of city Closed-Circuit Television, video investigation becomes a mainstream technology for criminal investigation. The major aim for using surveillance video is timely recognizing suspect clues contained suspect discovery and comparison. Traditional video investigation procedure depends on the human sea tactics, it can't satisfy the demand of fast criminal investigation. In recent years, some surveillance video intelligent analysis technologies are emerged, e.g., even detection, video retrieval, object tracking and person re-identification. However, the performance of using single above method for video investigation is limited. And these methods aim at different requirement, simple combination of them is also inefficient due to mismatching of the input and output of existing methods. In this paper, we propose a hierarchical video investigation system contained early investigation (clue discovery), deep investigation (suspect trajectory searching) and integrated suspect identity recognition. And considering the complexity of surveillance video scenes, we joint user's knowledge in order to promote our system in complicated surveillance video scene.

<u>Keywords:</u> Surveillance Video; Video investigation; suspect discovery; suspect comparison; user –driven.

7. Ahmed R. Elsherif, Wei-Peng Chen, Akira Ito, Zhi Ding: *Revenue Maximization of Mobile Network Operators Using Dual-Band Small Cells.* 

<sup>1</sup>Fujitsu Laboratories of America, Inc., USA <sup>2</sup>University of California, Davis, CA, USA

Abstract: The use of small cells have become popular to offload traffic from the traditional macrocells and to improve cell coverage. At the same time, WiFi interfaces have been recently incorporated in most cellular user equipments (UEs). The current practice is that UEs select either the licensed band for cellular technologies or the unlicensed WiFi band depending on the signal quality of both bands. In this paper, we present a new business model for maximizing the Mobile Network Operator (MNO) revenue by exploiting both licensed and unlicensed bands. On one hand, the user experiences throughput enhancement due to the potential capacity increase when using both bands. On the other hand, since the users are being delivered higher data rates, the MNO can charge users more and maximize its revenue. Our proposed method allows small cells to jointly control transmission in both licensed and unlicensed bands in order to maximize the MNO revenue while constraining the interference effect to maintain the Quality of Service (QoS) requirements for macrocell user equipments. Performance evaluation shows that our proposed scheme outperforms other existing solutions.

#### Keywords:

8. Fanxi Yan<sup>1</sup>, Yongqiang Lu<sup>2</sup>, Dan Wang<sup>1</sup>, Yu Chen<sup>2</sup>, Yuanchun Shi<sup>2</sup>, Nazim Agoulmine<sup>3</sup>: *A High-Performance Plug-and-Play Gateway for Cloud-Sensor Systems.* 

<sup>1</sup>Beijing University of Technology, Beijing, China
 <sup>2</sup>Tsinghua University, Beijing, China
 <sup>3</sup>IBISC Laboratory, University of Evry, Paris, France

Abstract: An emerging cloud-based service model is that end users have various sensors/devices gather and transfer the data to service systems on the cloud to process. Different kinds of data-collectors or gateways are normally employed at the user side, which can resolve the data-path issues of serviceproviders but mostly fail to share with other vendors. In order to reduce the provider maintenance costs, achieve sensors autonomous management and plug-and-play, a common architecture is necessary to evolve multi-sensor fusion in the smart environment. This paper proposes a gateway architecture by sticking to which all kinds of service providers can share the common data-path the without providing any proprietary data-processing to cloud protocols/algorithms at the shared gateway. In the meantime, the manner to use the sensors based on the gateway is just Plug-and-Play, which greatly lowers down the cost of user-supporting and improves the user experience.

<u>Keywords:</u> Plug-and-Play, Cyber Physical System, Internet of Things, Cloud-Sensor System, Plug-and-play.

• **Tea Break** 11:00 am – 11:15 am

- Special session: Distributed Intelligence, Intelligent Energy Management & Environmental Protection 11:15 am – 12:30 pm
  - 1. Gangzhu Qiao, Chunfu Hu, Jianchao Zeng: *Artificial Neural Network Based Aided Localization Method for Wireless Sensor Network.*

Complex System and Computational Intelligence Lab, Taiyuan University of Science and Technology, Taiyuan, China

<u>Abstract:</u> Along with the development of wireless Sensor Network technology, Wireless Sensor Network (WSN) is widely used in intelligent environment, such as environment monitor, Smart home, structure monitor and so on. WSN based Localization service also is one of important essential issues for intelligent environment. Limited by the current WSN localization method, localization accuracy is very low. In this paper, a artificial neural network based aided localization method is proposed, which use the actual location information as input and the corresponding measure data with high data error as output to train artificial neural network, and then use the trained artificial neural network correcting the measure data to improve localization accuracy of WSN. Experimental results show that the method proposed in this paper can fixed localization error effectively, and is very useful for WSN localization.

<u>Keywords:</u> Wireless Sensor Network; Aided Localization; Artificial Neural Network.

2. Guo-you Zhang<sup>1,2</sup>, Jian-chao Zeng<sup>2</sup>: Research on Task Allocation Based on Wasp Swarm algorithm in Environmental monitoring.

<sup>1</sup>College of Electrical and Information Engineering, Lanzhou University of Technology, Lanzhou, China

<sup>2</sup>Complex System and Computational Intelligence Lab, Taiyuan University of Science and Technology, Taiyuan, China

<u>Abstract:</u> Environmental monitoring is one of essential issues in intelligent environment. In this paper, we presents the Task allocation algorithm on environmental monitoring based on wasp swarm algorithm, which is inspired of wasp division labor and modeled by response threshold, A potential application scenario is presented with an explanation of how the algorithm can be deployed to solve the problems of task allocation. Simulation results demonstrate the algorithm has a number of desirable properties and the method is effective.

Keywords: wasp swarm; response threshold; environmental monitoring.

3. Songdong Xue<sup>1</sup>, Jianchao Zeng<sup>1</sup>, Guoyou Zhang<sup>2</sup>, and Zhibin Xue<sup>3</sup>: Coordination *Method for Swarm Robotic Search in Natural Disasters and Accidents.* 

<sup>1</sup>Engineering Technology of Internet of Things Research Center, Taiyuan University of Science and Technology, Taiyuan, Shanxi 030024, China <sup>2</sup>College of Electrical and Information Engineering, Lanzhou University of Technology, Lanzhou, China <sup>3</sup>School of Chemical Technology, Qinghai University, Xining, Qinghai 810016, China <u>Abstract:</u> To employ automated artificial devices as response for natural disasters or accidents, the authors tried swarm robots for target search such as victims or dangerous sources in public emergency under swarm intelligence framework. For this end, a specific algorithm called particle swarm optimization was extended for modeling and controlling swarm robotic system for simplicity. Here, we mapped the above algorithm in case of nonlinear function optimizing to swarm robotic search by considering their similar mechanisms and constructing relations between particle and robot across abstract and physical levels. Then we analyzed kinematic properties of robot to get a hybrid mathematical-physical model by integrating such algorithm and robot for fully distributed controlling. Results from massive simulations indicated that our proposed method is valid and that the scale of swarm robotic system plays a positive role on search efficiency enhancement.

<u>Keywords:</u> swarm robotics, particle swarm optimization, target search, coordination control

4. Jing Zhao, Jian-chao Zeng: Voronoi Diagram based Coverage Algorithm for Wireless Sensor Network.

Complex System and Computational Intelligence Lab, Taiyuan University of Science and Technology, Taiyuan, China

<u>Abstract:</u> The coverage problem is a very important research topic in wireless sensor networks (WSNS). With minimal node to achieve the maximum coverage area has been the objective of the study. Voronoi diagram, also known as Tyson polygonal or Dirichlet diagram, is a continuous polygon whose line is a perpendicular bisector line of a straight line connecting two adjacent points. Between each pair of adjacent nodes, its each point of perpendicular bisector has the minimum probability to be monitored. In this paper the authors present Voronoi Diagram based Coverage Algorithm for Wireless Sensor Network , in this algorithm the blind spot ,which has the minimum monitoring probability, is redeployed a sensor , in order to achieve maximum coverage area with a minimum of nodes. The algorithm can be applied to the monitoring of the area in the research of universal village.

<u>Keywords:</u> Wireless sensor network, Sensor, Voronoi diagram, coverage, perpendicular bisector.

#### Lunch 12:30 pm – 1:30 pm

#### Afternoon 1:30 pm – 5:30 pm

- Session C: Intelligent Transportation 1:30 pm 3:00 pm
  - 1. (invited talk) Feiyue Wang: *Parallel Control and Management of Urban Transportation Systems.*

The State Key Lab of Management and Control for Complex Systems, Beijing, China

<u>Abstract:</u> Parallel control and management have been proposed as a new mechanism for conducting operations of complex systems, especially those involve with complexity issues in both engineering and social dimensions, such as transportation systems. This talk will present an overview of the background, concepts, basic methods, major issues, and current applications of Parallel Transportation Management Systems (PtMS). Essentially, parallel control and management is a data-driven approach for modeling, analysis, and decision making that considers both engineering and social complexity in its processes. Developments and applications of PtMS indicate clearly that it is effective for networked complex traffic systems and is closely connected to emerging technologies in cloud computing, social computing, and cyber-physical-social systems.Description of the system architectures, processes, and components, including OTSt, DynaCAS, aDAPTS, iTOP, and TransWorld of PtMS will be presented and discussed. Finally, experiments and examples of real-world applications are illustrated and analyzed.

Keywords:

2. Xianghui Bai, Bingrong Wang, Huanyu Wang, Zhiming Tan, and Akihiro Higashi: *High Accuracy Distance Measurement System with Stereo Fisheye Cameras.* 

Fujitsu Research and Development Center Co., Ltd., Shanghai Laboratory, No.1155 Fangdian Road, Pudong District, Shanghai, 201204, P.R.China

<u>Abstract:</u> A high accuracy distance measurement system with stereo fisheye cameras for car driving assistance is proposed. It consists of 3 components: fisheye correction, disparity estimation, and distance calculation. Fisheye images captured by stereo cameras are projected to 3 perspective planes after fisheye correction. Then the disparities of projected images are estimated by a novel method based on adaptive window. At last, the distance between objects and the system is calculated by triangulation. The results show that the distance measurement precision achieves 2cm at about 1m.

Keywords: stereo; fisheye camera; distance measurement; car navigation.

3. Xiang Zhang: Intelligent Vehicle is one of the future trends for the Universal Village.

Strategy Consultant Division, Neusoft Corporation, Neusoft Software Park, No. 1000, Ziyue Road, Minhang District, Shanghai 200241, China

<u>Abstract:</u> Result from the detailed studies of the maturity and applications of Telematics, Advanced Driver Assistance System (ADAS), Electric Vehicle, Intelligent Transportation System (ITS) and Driverless Cars technologies; with the assumption of the Intelligent Vehicle consisting of these technologies in the current Auto Industry, has lead to the prediction that the Intelligent Vehicle will go to market in the next 5 years; but only in the form of public transportation and luxury cars. It can also be further predicted that the mass production will not take place in another 10 to 15 years, due to its high cost and pricing.

Keywords: Telematics, ADAS, Electric Vehicle, ITS, Driverless Cars.

4. Shanren Nie, Xia Zhang, LiJun Zhao, Qian Zhang, QiZhen Pei: A Relay-Based In-vehicle Internet Connecting System.

Neusoft Corporation, National Key Laboratory of Software Architecture, Neusoft Park, No.2 Xinxiu Street, Hunnan District, Shenyang, Liaoning Province, China

<u>Abstract:</u> In this paper, a relay-based in-vehicle Internet connecting system is presented. The vehicle is connected to Internet through a smartphone, which poles the role of a relay. Data collected from the vehicle can be transmitted to a cloud server using the smartphone. At the same time, services are provided by the smartphone as well as the cloud server. Users are not required to concern anything except for the vehicle since all the designs in the system are vehicle centered. Users can press buttons on the wheel or elsewhere and touch the screen of the headunit to get functions they need.

The system is integrated on the vehicle's side. When connecting the smartphone with the headunit, only the screen of the headunit is used to present output. Users' input on the headunit also will be sent back to the smartphone. As a result, the smartphone's services will be present and can be used on the headunit.

Drive data collected on the headunit will be sent to smartphone and then forwarded to the cloud server. After data mining and analysis, the output including the advices to the driver will be sent back to the headunit via smartphone and present to driver. As a result, the system connect the vehicle to cloud in the most valuable way and benefit the driver directly.

The solution is just like a virtualization system. The services are provided on the smartphone, which serves as a host, while the users can use these services on the in-vehicle headunit, which acts as a client system. Securities and stabilities are promised by the separation of the smartphone and the headunit, and by cautious definitions of data types that can be transferred between the two sides. The proposed system is advantageous in many aspects, e.g. easy to implementing, no less to functions and saving money

Keywords:

5. Anping Han: Intelligent Control Platform Used in China High Speed Railway.

Signal & Communication Research Institute of China Academy of Railway Sciences, Beijing, China

<u>Abstract:</u> The safety critical system has been used in many control fields of China high speed railway (CRH). These systems control trains running safely. A 2×2002 intelligent control platform used in CRH has been introduced in the paper.

Keywords: Intelligent control platform, 2×2002.

- **Tea Break** 3:00 pm 3:15 pm
- Panel Discussion: The Trend of Intelligent Technology & Global Comparison of Smart City Projects 3:15 pm - 4:30 pm
- Closing Ceremony 4:30 pm 5:30 pm

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Main business areas: Intelligent transportation, rail transportation, software development, systems integration, intelligent building.

#### Qualifications:

- 1-degree Qualification for design and construct Intelligent Integrity Engineering awarded by State Construction Ministry;
- 1-degree Qualification in computer system integration awarded by Chinese Information Industrial Ministry;
- 1-degree Qualification awarded by Jiangsu Safety & Risk Prevention Technology Mechanism;
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## 无锡中盛医疗设备有限公司

无锡中盛医疗设备有限公司是无锡市政府重点支持的530企业。拥有一支优秀的科技管 理和研发人才队伍,长期致力于嵌入式技术与其他技术的相结合的产品应用研究。在无锡中 盛医疗设备有限公司成立前其核心研发团队从2003年开始以嵌入式技术为平台致力于传感 网医疗、教育、安全等领域产品方向研究并与国内外一些知名的企业和科研院校建立策略联 盟,核心团队人员平均有十多年经过市场洗礼丰富的电子工程技术和管理经验。



无锡中盛医疗设备有限公司主打的客制化数字健康(含数字医疗、数字教育等服务)平 台,以维护和促进健康为目标,向个人、家庭、社区提供连续、便捷的卫生服务。该平台作 为不同层级和属性的医院的信息补充,在家庭、社区与医院的信息沟通与交流中起到不可估量的巨大作用。

无锡中盛医疗设备有限公司秉行正派经营、务实创新之精神,实施"大公司策略,小核算体系,资本化运作,国际性市场" 的战略,不断整合优化运营流程,以建立永续经营之企业。



### 解决方案

该平台是应用于提供社区医疗的信息交换与流 通的基础交换平台,作为不同层级和属性的中心医 无线:采样平台→发射接收平台(3G技术)→接收 疗院所的信息补充。该系统目标是在构建医疗保健 产业链,建立家庭,社区医院和中心医疗三个层次 网络医疗保健体系。 平台包括提供部分采样前端产品和解决方案,数据 传输,后台管理,专家系统等。

其结构流程:

发射平台(3G技术)→后台管理(数据处理和安全认 证)→专家系统→用户。

有线:采样平台→Internet网络→后台管理(数据处 理和安全认证)→专家系统→用户。

企业名称:无锡中盛医疗设备有限公司 电话:0510-81021486 传真:0510-81021486 地址: 江苏省无锡市锡山经济开发区芙蓉中三路99号瑞云6座 邮编: 214192



The Solution Compilation of Global 100 Enterprises of Intelligent Community

## 中国卫生信息化意见领袖资讯社区

HIT 专家网(www.HIT180.com),以务实、前瞻的内容,致力于建设中国最专业的 医疗信息化网站,成为卫生信息化意见领袖资讯社区。推动信息技术在卫生行业的应用, 优化就医流程,提高医院运营效率,提高行政决策效率,缓解"看病难、看病贵"问题,促 进健康管理,迎接老龄化社会的挑战。

HIT 专家网自 2012 年 6 月正式创建上线以来,厚积薄发,以其专业的报道、务实的 立场、前瞻的分析、敏锐的洞察,已经在中国医疗卫生信息化领域产生日益重要的专业影 响,被誉为中国卫生信息人的"精神家园"、"思想智库"。

HIT 专家网充分发挥新媒体优势,通过官方网站、微博、QQ 群、EDM 等覆盖并影响 约 10 万医疗行业信息化主管及从业人员,实现专业、快速、精准传播。

HIT 专家网将作为独立的第三方行业专业媒体,力争成为中国卫生信息化用户与产业的桥梁、医疗 IT 产业与资本的纽带、卫生行业 CIO 的社交平台、医疗信息产业生态的联盟。

HIT 专家网(www.HIT180.com)是北京和思凯文化传媒有限公司旗下科技媒体品牌 北京和思凯文化传媒有限公司是在国家扶持文化创意产业、推进新医改大潮中应运而生的 文化创意、专注医疗卫生信息化的互联网创新企业。

地址:北京市海淀区花园路2号2幢5层517号(100191)

联系:Tel:(010)82237670 Email: xbingzhu@gmail.com

#### **Conference information in Chinese**

【会议邀请】

我们热忱地邀请您参加,于 2013 年 1 月 16~17 日,在北京清华大学校举行的第一届 Universal Village 国际研讨会(UV2013)。

"Universal Village"是我们提出的对未来社会发展的全新构思和理念。这个理念综合了未 来都市和田园生活的理想元素,提出了对未来多功能多格式智慧社区商业区的创新设计,并 倡导了新型智慧的工作生活方式。我们认为,实现这种全新构思和理念需要自上向下的系统 设计方法,倚靠现代科学技术来应对目前全球大规模城镇化趋势带来的新挑战,给人类提供 切实可行的解决方案,改善提高生活质量。

本次国际研讨会邀请了学术界专家、工业界的优秀代表和政府部门三方参会,从智慧环境、 智慧医疗、智慧交通系统、智慧节能环保等多个方面来共同探讨未来的城镇、乡村、小区的 展望和远景规划,寻求整体系统的最优化方案。

有关中文信息附后,更多细节请参见大会主页:http://www.universal-village.org/

我们热忱邀请您拨冗参会,共商发展大计,期盼您的莅临指导!

此致

敬礼

#### UV2013 组委会

【会议内容】

"Universal Village"是我们提出的对未来社会发展的全新构思和理念。这个理念综合了未来 都市和田园生活的理想元素,提出了对未来多功能多格式智慧社区商业区的创新设计,并倡 导了新型智慧的工作生活方式。我们认为,实现这种全新构思和理念需要自上向下的系统设 计方法,倚靠现代科学技术来应对目前全球大规模城镇化趋势带来的新挑战,给人类提供切 实可行的解决方案,改善提高生活质量。

第一届 2013 国际 Universal Village 会议将探讨如何发展真正智能的技术用以建设未来的 Universal Village,如何建设涵盖智能医疗,智能交通,智能环境,智能型环保与能源管理 在内的重要智慧子系统,包括对各个子系统以及整体系统的设计、开发和工程实施,以及基 础建设、新材料、信息网络等具体工程技术内容。会议的另一个重要宗旨是促进和加强对各 个智慧子系统之间相互作用和联系的研究,对系统的整体集成的研究,以及在未来城镇智慧 化进程中的各个智慧子系统和整体系统之间的多种动态变化和影响的研究。

会议同时希望探讨多个学科多个领域之间的可能合作,探讨学术界工业界政府部门的协调合 作模式。会议将进一步讨论不同地域、文化等因素对于未来社会发展可能的影响,探寻适合 各自国家和地区发展的关键技术和发展路径,以及多个国家如何加强国际合作。除了这些技 术方面,本次会议还将讨论 Universal village 这一新理念所包含的人文和社会内涵,这一理 念对生活方式,经济发展和未来社会的影响。 本次会议选择在中国举行,原因有三。第一是,中国的快速城镇化进程涌现了大量的新问题, 对现代技术和社会都带来了新的挑战。第二是,中国表现出了积极应对这些挑战的强烈意愿, 正在调集资源来积极寻求切实可行的解决方案,第三是为了增进国际间的科学合作。这次会 议设有两个特别专题汇报:中国智慧城市的发展和日本智慧城市的发展,希望这两个专题汇 报对于您的工作也能有所帮助。

这次国际会议邀请了学术界、工业界的优秀代表和政府部门三方参会,把各个相关领域的专家集聚一堂,从智慧环境、智慧医疗、智慧交通系统、智慧节能环保等多个方面来共同探讨未来的城镇、乡村、小区的展望和远景规划,使他们能够在相互交流和探讨中,不再局限于各个子系统的局部最优,而去寻求整体系统的最优化方案。本次会议希望为政府,工业界和学术界各自感兴趣的问题提供实际解决的方法或者前景。我们非常期待您的支持,来共同唤起更多人对于"Universal Village"的关注以及对于未来智慧化发展的系统性思考,从而将"智能/智慧"的元素真正融入到我们的未来。

### 【会议组委会】

- ▶ 发起者和主办方:麻省理工学院智能交通研究中心 Universal Village Program
- ▶ 承办方:清华大学
- ▶ 协办方:富士通中国研发中心、东软集团(排名不分先后)
- 合作方:无锡市科技局,武汉智慧城市研究院,太原科技大学,麻省理工学院产业联盟 办公室,武汉维视德科技有限公司
- ▶ 赞助方:无锡大为科技有限公司,无锡中盛医疗设备有限公司、富士通中国研发中心
- ▶ 技术与出版支持: IEEE 国际智能交通系统协会 (IEEE ITSS)
- ▶ 发起主席: Dr.Ichiro Masaki,麻省理工学院智慧交通系统研究中心主任,首席研究科学家自动驾驶汽车最早的提出者,IEEE 智能汽车会议发起主席
- ▶ 会议主席: Prof. Berthold Horn,美国科学院院士,麻省理工学院教授,智慧监控、机器人视觉方面的专家
- ▶ 执行主席兼财务主席: Dr. Yajun Fang,麻省理工学院智慧交通系统研究中心 Universal Village 项目协调人
- ▶ 出版主席: Dr.Satoshi Naoi, 富士通研究 • 中心总经理
- ▶ 当地主席: 吕勇强博士,清华大学教授

【会议专家顾问成员】(排名不分先后)

- ▶ 卫生部医院管理研究所所长暨卫生部医院信息管理委员会主任委员梁铭会
- ▶ 北京航空航天大学中法工程师学院院长熊璋,863 智慧城市首席科学家
- ▶ 清华大学教授,清华信息科学与技术国家实验室普适计算研究部主任史元春
- ▶ 哈佛大学公共卫生学院中国项目部主任刘远利
- ▶ 麻省理工学院教授微电子实验室前主席 Prof. Charlie Sodini
- ▶ IEEE 智能交通系统协会前主席 Prof. Alberto Broggi
- ▶ IEEE 国际智能交通系统协会出版副总, Prof. Zeng Daniel
- ▶ IEEE 国际智能交通系统协会杂志主编, Prof. Fei-yue Wang

【会议可以提供的服务】

这次国际会议的参会者有机会与来自国际专家、工业界优秀代表和政府部门三方交流,聆听 到在 Universal Village 方面的最新理念和研究方向,以及未来的城镇、乡村、小区的展望和 远景规划,可以了解到在目前智慧城市发展的动态,包括智慧医疗、智慧环境、智慧交通系 统、智慧节能与环保等方面的最新发展状况,本次会议希望为政府,工业界和学术界各自感 兴趣的问题提供实际解决的方法或者前景。

论文作者将在会议上发表学术论文。公司参会者可以在会议上介绍各自公司的一些与智慧城市相关的发展状况。

本次会议设有展厅,为每一位注册的个人或者单位提供了可以有一个 60cm x 90cm 大小的 展板,用以张贴海报,两天内一直在展厅内展出。欢迎作者或者相关单位用海报形式介绍学 术研究以及公司的信息,以便有更多机会和大家交流。也欢迎参会者在展厅内分发一些相关 资料。

【会议语言】 中英文均可。两天会议均提供同声传译

【会议地点】 北京市海淀区清华园1号 清华大学美术学院,A座,A301

【晚宴地点】 文津国际酒店 http://www.wenjin.com.cn/ 北京 海淀区 清华科技园(上地、中关村地区 近清华大学南门)

【会议注册与费用】

注册页面: http://universal-village.org/registration/

注册过程中,页面会转入 Paypal 的付款页面,请您在 Paypal 页面下用信用卡进行付款。 请注意仅当您完成 Paypal 付款之后,您的注册才算完成,否则您的注册状态将为"待定"。

注册求助页面: http://universal-village.org/registration/registration-problem-report/

	注册费		
注册日期	职业人士	学生	
2012.12.02之前	\$699.00	\$399.00	
2012.12.03 $^{\sim}$ 12.15	\$749.00	\$449.00	
2012.12.06 之后	\$849.00	\$549.00	

【论文出版】

会议收录论文将被录入由 IEEE 智能交通系统协会出版的 IEEE 会议论文集,优秀论文将选入专刊。

【日程安排】

#### 第一天: 2013年1月16日

上午:

- ▶ 开幕仪式
- ▶ 专题汇报: Universal Village, what, why, how?

下午:

- ▶ 专题汇报 A: 智慧医疗
- ▶ 特别专题汇报:中国智慧城市实践
- ▶ 特别专题汇报:日本智慧城市实践

会议晚宴

第二天: 2013 年 1 月 17 日

上午:

- ▶ 专题汇报 B: 智慧环境
- ▶ 特别专题汇报:分布式智能,智慧能源管理与环境保护

下午

- ▶ 专题汇报 C: 智能交通
- ▶ 专家讨论:智能技术趋势与全球智慧城市发展对比
- ▶ 闭幕式