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Web Archive and Electronic Newsletter
Subscription

The IEEE ITS Society Newsletter is published quarterly in January, April, July, and October. The current and all past issues of the Newsletter may be downloaded at no charge from the Society’s web site:

www.ieee.org/itss

You may subscribe to or unsubscribe from announcements at the same web site. Announcements are sent to approximately 10,000 ITS professionals from industry, academia, and government.

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Information for Contributors

Announcements, feature articles, book and meetings reviews, opinions, letters to the editor, professional activities, abstracts of reports, and other material of interest to the ITS community are solicited. Please submit electronic material for consideration in any of the following formats:

SOCIETY NEWS

From the Editor

by Charles Herget

This issue of the Newsletter contains messages from the Editor-in-Chief of the IEEE Transactions on ITS and the Editor-in-Chief of the ITS Society Magazine; calls for papers for our new Magazine and an upcoming special issue of the Transactions; conference announcements; and abstracts from the most recent issue of the Society’s Transactions.

A new feature in the Newsletter is the inclusion of abstracts from the Society’s Magazine. The first issue appeared in the Spring of this year. The Magazine is sent to all members of the Society as one of the benefits of membership.
The officers of the Society are very pleased with the latest report on the impact of the Society’s Transactions. Please read the report by the Editor-in-Chief of the Transactions in this Newsletter. For information on how the impact is computed and some discussion on its significance, please see http://en.wikipedia.org/wiki/Impact_factor.

A call for nominations for candidates for election to the Society’s Board of Governors is included in the next section.

I welcome any comments you may have on how to improve the Newsletter. Please send me an email at c.herget@ieee.org.

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**Call for Nominations for the ITS Society Board of Governors**

The governing body of the Society is called the Board of Governors (BoG). The BoG consists of the officers of the Society and fifteen members elected by members of the Society.

Every year, five members the BoG conclude their term and must be replaced by an election.

Candidates for the BoG are selected by the Nominations and Appointments (N&A) Committee. The Chair of the N&A Committee this year is Charles Herget, a past-president of the Society (2005).

The Chair of the Nominations Committee is now calling for nominations for possible candidates to apply for these positions. BoG members meet at least once per year (generally during the IEEE ITS Conference) and make decisions on all important matters of the Society.

Please send your nomination (or self-nomination) to the Chair of the N&A Committee at c.herget@ieee.org no later than July 31, together with a brief statement, presentation, or curriculum vitae.

Candidates must be IEEE members and also members of the ITS Society. At least eight candidates are required to be nominated to fill the five positions that will become vacant on January 1, 2010.

Please check the Society bylaws at http://www.ewh.ieee.org/tc/its/bylaws.html#articleV for additional information.
We have great news to share with you. According to the SCI Impact Factor Report released by ISI on June 22, our journal, the IEEE Transactions on Intelligent Transportation Systems, has been ranked as Number One in all transportation related publications!

We wish to congratulate and say thanks to all of our associate editors for your great work and service! We also want to acknowledge our former Editor-in-Chief Prof. Alberto Broggi, our founding Editor-in-Chief Prof. Chip White, our editorial staff at IEEE, and last but definitely not least, Simona Berte’!

In 2008 our Impact factor was 2.844. We have the highest 5-Year Impact Factor, 3.302, among all publications in the transportation sector.

In addition, we are ranked 21st among all IEEE publications, a big leap from 32nd in 2007. Note that all other transactions before us have been well established for years, and we are the youngest.

### 2007 Impact Factors

<table>
<thead>
<tr>
<th>Rank</th>
<th>Abbreviated-Journal Title (Indexed to Journal Information)</th>
<th>Impact Factor</th>
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The inaugural issue of the IEEE Intelligent Transportation Systems Society is printed and is provided as an additional benefit of society membership to all our ITSS members. It can also be purchased by non-ITSS members or accessed online via ieeexplore.ieee.org.

The Magazine provides up-to-date information for engineers in the field of ITS, such as news from the ITS Society, information on upcoming conferences and events and articles of a broad interest to our society. The first issue includes the following articles:

- Steven Shladover, “Cooperative (Rather than Autonomous) Vehicle-Highway Automation Systems”
- Jeffrey Miller, “Dynamically Computing Fastest Paths for Intelligent Transportation Systems”
- Qing-Jie Kong, Yikai Chen, and Yuncai Liu, “A Fusion-Based System for Road-Network Traffic State Surveillance: A Case Study of Shanghai”
Beyond regular submissions with a strong emphasis on practical deployment the new Magazine welcomes manuscripts that provide an overview on a recent topic, new concepts for ITS or a tutorial to methods that are particularly relevant to ITS.

Please find more information and the call for papers to our new Magazine at www.ieee.org/itss, clicking on ‘Magazine’.

We are looking forward to receiving high level contributions. More information for prospective authors is provided in the call for papers in this newsletter.

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**Announcements**

**IEEE Medal for Environmental and Safety Technologies**
(Sponsored by: Toyota Motor Corporation)
*submitted by Alberto Broggi, President-Elect, IEEE ITS Society*

The IEEE Medal for Environmental and Safety Technologies was established in August 2008.

It may be presented each year to an individual, or to a team up to three in number, for outstanding accomplishments in the application of technology in the fields of interest of IEEE that improve the environment and/or public safety.

The first presentation is scheduled for June 2010. The award consists of a gold medal, bronze replica, certificate and cash honorarium.

In the evaluation process, the following criteria are considered: public benefits of the contribution; degree of improvement in important performance metrics; innovative design, development or application engineering; favorable influence of the contribution on technical professions.

Recipient selection is administered by the Medals Council of the IEEE Awards Board.

The committee includes:

- Fumio Harashima, Chair
- Alberto Broggi
- Thomas Conte
- Toshio Fukuda
- Thomas N. Rubinstein
- Mark Schaffer
- Robert Shapiro
- C. K. Toh
- Pravin Varaiya
- Joseph Ziomek

Nomination Deadline - 31 July 2009

Web site: [www.ieee.org/portal/pages/about/awards/sums/environmentmdl.html](http://www.ieee.org/portal/pages/about/awards/sums/environmentmdl.html)

To discuss nominations, please contact Alberto Broggi at broggi@vislab.it.
IEEE ITSS Best Practice Award for Engineers

The IEEE Intelligent Transportation Systems Society is pleased to announce that the winner of the IEEE ITSS Best Practice Award for Engineers for 2009 is Dr. Fei-Yue Wang.

Dr. Wang holds joint appointments as (1) Research Scientist, Institute of Automation, Chinese Academy of Sciences, Beijing, China; and (2) Professor, Department of Systems and Industrial Engineering, the University of Arizona, Tucson, Arizona, USA.

Excerpts from the nomination follow.

Professor Fei-Yue Wang is among the first group of experts who have made significant contribution to the research, development, and applications of intelligent transportation systems in China. Since 1993, he has presented many lectures and reports on ITS research and applications at Chinese universities, research institutes, and governmental departments for both operation and administration. In 1999, under his leadership, the Chinese Academy of Sciences established its first ITS R&D Lab, which has been developed into a center of excellence with over 50 researchers and engineers and was renamed to the CAST (Complex Adaptive Systems for Transportation) Lab in 2006.

Professor Fei-Yue Wang’s contributions to ITS are not limited to his research and organizational works in China and IEEE through his leadership positions, he personally spent a great effort in develop application systems and went to traffic departments and enterprises to promote the use of ITS technology. Professor Wang’s specific contributions in ITS development and application can be summarized.

1. National ITS Standards in China
Professor Wang has participated extensively in establishing China’s national standard for ITS applications. Particularly, he is the leader and principal author of the “Protocol for Data Exchange and Communication within Local Intersection Traffic Controllers and between Controllers and Traffic Control Centers” National Standard GB/T 20999-2007, People’s Republic of China. This standard was announced to the public on July 17, 2007, for comments and suggestions, and then was implemented on January 1, 2008.

2. ITS Patents
Since 1999, Professor Wang has authored over 30 patents in the area of traffic control and intelligent vehicles while several others are still under review and verification:

3. CASIC Intersection Traffic Controller and GreenPass Traffic Control and Management System
Since 1999, Professor Wang has led the effort to develop intelligent and networked intersection traffic controllers using agent-based control method with built-in video image processing capability. Until now, no other research organization or enterprise has explored systematically the same agent-based method for real applications, especially traffic control and management. Furthermore,
five generations have been developed since its real-world applications started in 2002.

4. ITS Applications
Since 2002, both CASIC and GreenPass (the two systems are distributed separately) have been used in many regions of China through licenses from the Chinese Academy of Sciences, especially in Yangtze River Delta Region and the nearby Shandong Province, an area consisting of almost 40% of Chinese population and is considered the engine of China’s economic development.

5. Next Generation ITS Control and Management: Parallel Transportation Control and Management Systems
In addition, to the immediate ITS applications, Professor Wang has worked hard to promote the next generation ITS control and management systems for better efficiency and high performance. Since 2004, he has been advocated the concept of Artificial Transportation Systems and Parallel Transportation Systems (PtMS) based on modeling traffic systems with artificial societies, conducting traffic analysis by computational experiments, and perform traffic control and management through parallel execution of real and artificial systems.

6. Awards
Professor Wang has received numerous awards for his ITS related research and applications, including (a) an Outstanding Teaching Award (for the Development of Embedded Systems Lab and Teaching): Chinese Academy of Sciences, Beijing, China, 2008, (b) Science and Technology Progress Award (for the Development of an Linux and OSKE/VDX based Vehicular Application Specific Operation Systems (vASOS)), Beijing, China, 2008, and (c) National Prize in Natural Sciences Award (The Highest Honor for the Basic Research in 2007 in China) for his outstanding contributions in theory and application of intelligent control, 2007, China.

Members of the ITSS Award Selection Committee for the IEEE ITSS Best Practice Award for Engineers were Sudarshan Chawathe, Petros Ioannou, Bill Scherer, Masayoshi Tomizuka, and Jason Geng.
Call for Papers

IEEE Intelligent Transportation Systems Magazine

Scope

Innovations in mobility require close interaction between research and practitioners in all aspects of Intelligent Transportation Systems. As the new dissemination magazine of the IEEE ITS Society, the IEEE Intelligent Transportation System Magazine establishes an interdisciplinary forum connecting experts in all fields of ITS. It publishes news on ITS as well as peer-reviewed articles quarterly that

- provide innovative research ideas and application results,
- report significant application case studies, and
- raise awareness of pressing research and application challenges

in all areas of intelligent transportation systems.

Topics

- Ground, Air, and Water Transportation Systems
- Information Management (Databases, Data Fusion)
- Sensors (Infrastructure and Vehicle-Based)
- Sensor Data Processing (Video, Radar, Lidar, etc.)
- Human-Machine Interfaces
- Communication (v2v, v2i)
- Social, Economic, and Ecologic impact
- Field Studies & Implementation Reports
- Control (Traffic and Vehicle)
- Decision Systems
- Simulation
- Reliability and Safety
- Standards & Public Policies
- Technology Forecast & Transfer

Paper Submission

Authors may submit Regular or Short Technical Papers, Tutorials, Surveys, Technology Reviews, Reports on Successful Implementations, Policy, or Educational Issues, directly to the Editor-in-Chief. Papers will be reviewed by independent reviewers and accepted papers will be published in the IEEE ITS Magazine.

IEEE ITS Society web site

Up to date information on the IEEE ITS Magazine and further publication guidelines are provided at the official ITSS web site www.ieee.org/itss

Editor-in-Chief

Papers shall be submitted directly to the Editor-in-Chief: Christoph Stiller, Institut für Mess- und Regelungstechnik, Universität Karlsruhe (TH), 76131 Karlsruhe, Germany; email: stiller@mrt.uka.de
Special Issue of IEEE Transactions on Intelligent Transportation Systems

Exploiting Wireless Communication Technologies in Vehicular Transportation Networks

Since the advent of Intelligent Transportation Systems, research on the use of information for real-time transportation system management has been much conducted. The recent advances in wireless and sensor technologies have rapidly promoted the seamless integration of information of various types from transportation networks to benefit drivers and provide a wide array of transportation-oriented services. These advances in information technology and wireless communications have enabled innovative and cost-effective mobile services and applications for traffic networks. It is envisioned that inter-vehicle and infrastructure-to-vehicle communications would become technically practical in the near future, resulting in an operational “internet on the road”. Due to its interdisciplinary nature, this area has sparked a great deal of interest among researchers in wireless communication, transportation and traffic engineering, vehicular technologies, network operational research, etc. In addition, the area has gained significant traction with both public agencies and private industry. The goal of this special issue is to bring together the recent advances in vehicular infrastructure integration (VII) and vehicle-to-vehicle communications (V2V) paradigms that aim to develop efficient information dissemination systems to significantly improve traffic management, safety, and control. The topics of interest include but are not limited to:

- Vehicle to vehicle and vehicle-to-infrastructure communications technologies
- Vehicle mobility management with communications
- Vehicular network modeling and performance analysis
- Algorithms and protocols addressing the integration of communication and transportation layers
- Security and Privacy Issues of VII and V2V systems
- VII and V2V simulation, implementation, and field testing
- VII and V2V applications to road safety

High-quality papers are solicited and will undergo the normal peer-review procedure of the journal for inclusion in the Special Issue. Manuscripts should be submitted before the deadline at http://mc.manuscriptcentral.com/t-its/ by selecting the manuscript type “Special Issue on VII and V2V”.

Guest Editors:
Professor Satish Ukkusuri, Rensselaer Polytechnic Institute, e-mail: ukkuss@rpi.edu
Professor Tricia Chigan, Michigan Technological University, email: cchigan@mtu.edu
Dr. Yibing Wang, Monash University, e-mail: viping.wang@eng.monash.edu.au

Important Dates:
Submission of Manuscripts: 31 July 2009
Peer-Review Results: 31 October 2009
Final Accepted Paper: 31 December 2009
Special Issue Publication: 2010
After more than six years’ discussion, organization, and preparation, the 2009 IEEE Intelligent Vehicles Symposium (IEEE IV’09) was finally held from June 3 to 5 at Xi’an, Shaanxi, China, and the event was a huge success. This is the first time that the IEEE IV has come in China. The conference was held simultaneously with other two conferences, the 2009 Future Challenge: Intelligent Vehicles and Beyond (as the Demo of IEEE IV’09) and the Annual Project Review Meeting by the National Natural Science Foundation of China for all projects in the cognitive computing program, a five year and 150m (RMB, about 25M USD) effort launched in 2008 with focus on developing new algorithms and systems for intelligent vehicles.

IEEE IV’09 received 532 submissions from over 20 countries and regions, and the Program Committee selected 31 papers for oral presentation, and 220 for poster discussion. Over 500 people attended IEEE IV’09 and almost 60% were come from outside China. Prof. Alberto Broggi from Italy, Dr. Paul Werbos and Prof. Umit Ozguner from USA presented three keynote speeches, entitled “High Levels of Automation in Next Generation Vehicles”, “How to Liberate the World from Oil: Intelligent Systems for Cars, Trucks and Electricity Generation Without Fossil Fuel”.

Mr. Sven Kraus and co-authors from Technische Universität München received The First-Class Best Poster Presentation Award (with a $500 Cash and a certificate), the Second and Third Class Award were given to Mr. Wei Liu and co-authors from Xian Jiaotong University and Mr. Yajun Fang and co-authors from MIT for $300 and $200 and certificates, respectively. At the conference banquet, the 2008 IEEE ITSS Institution Lead Award was presented to the VisLab, Universita' di Parma, and the IEEE ITSS Outstanding ITS Application Award was given to Professor Petros A. Ioanno, the University of Southern California, Los Angeles, CA, USA.

The demo of the conference, the 2009 Future Challenge: Intelligent Vehicles and Beyond was a real great success and attracted a great deal of public and media attention in China. Six teams from China and outside participated in the competition. The Future Challenge is an continuation of the 2006 Intelligence Vehicle Competition (Modern Vehicles on Ancient Camel Road) held in the first IEEE International Conference on Vehicular Electronics and Safety (IEEE ICVES, another ITSS sponsored conference) in Xian. The Future Challenge will be held annually and Chinese NSF will use it as a platform to review and verify its projects on cognitive computing and intelligent vehicles.

The 2010 IEEE Intelligent Vehicles Symposium (IV’10) will be held in San Diego, CA, USA.

Reported by: Fei-Yue Wang, Program Chair, IEEE IV’09
Nanning Zheng, General Chair, IEEE IV’09
IEEE ISI 2009 was successfully held in Dallas, Texas, in June 2009. Hosted by the University of Texas at Dallas and the University of Arizona with main sponsorship from the IEEE ITS Society, ISI 2009 also received co-sponsorship from The University of Texas at Dallas, Air Force Office of Scientific Research, Raytheon Corporation, and US National Science Foundation.

Intelligence and Security Informatics (ISI) is an interdisciplinary subject that focuses on the development and use of advanced information technologies, including methodologies, models and algorithms, infrastructure, systems, and tools, for local, national/international, and global security related applications through an integrated technological, organizational, behavioral, and policy based approach. In the past and present the IEEE ISI conferences have brought together academic researchers, law enforcement and intelligence experts, information technology consultants and practitioners to discuss their research and practices related to various ISI topics. The ISI conference series (http://www.isiconference.org) was first started in Tucson, Arizona in 2003 and 2004. With sponsorship by the IEEE Intelligent Transportation System Society, ISI 2005, ISI 2006, ISI 2007 and ISI 2008 were held in Atlanta, Georgia, San Diego, California, New Brunswick, New Jersey, and Taipei, Taiwan respectively.

The themes of ISI 2009 spread over context-aware data analysis, effective counterterrorism, and public education on cybercrime detection. The four-day program included several invited talks, two parallel paper presentation sessions, three tutorials, and three workshops. The invited speakers from the Air Force Research Laboratory, Hewlett Packard, Intelligence Advanced Research Projects Activity, National Science Foundation, Oak Ridge National Laboratory, Rand University, Raytheon Corporation, Rockwell Collins Corporation, University of Maryland Baltimore County and the University of Texas at Dallas covered topics of cybercrime, countering terrorism, activism, homeland security data mining, data security, social network analysis, privacy-aware data mining, social computing, intrusion detection, and intelligent pattern recognition. There were 27 long papers, 23 short papers, and 12 extended abstracts presented. Contributing authors came from seventeen countries and regions, including Australia, Belgium, Canada, China, Denmark, Germany, Hong Kong, India, Iran, Israel, Malaysia, Republic of Korea, Taiwan, Tunisia, Turkey, United Kingdom, and United States.

Three awards were presented at the Conference Banquet on June 9, 2009. Dr. Arthur Becker was awarded the 2009 ISI Research Leadership Award for his outstanding contributions to and sustained leadership in the field of Intelligence and Security Informatics. Dr. David Skillicorn was awarded the ISI 2009 Technical Achievement Award for his outstanding and sus-
tained technical contributions to the field of Intelligence and Security Informatics. Mr. Fatih Ozgul, Mr. Zeki Erdem, and Dr. Chris Bowerman were awarded the Best Paper Award for IEEE ISI 2009 for their work, "Prediction of Past Unsolved Terrorist Attacks."

Reported by

- Bhavani Thuraisingham, Univ. of Texas, Dallas (conference co-chair)
- Hsinchun Chen, Univ. of Arizona (conference co-chair)
- Latifur R. Khan, Univ. of Texas at Dallas (program co-chair)
- Daniel Zeng, Univ. of Arizona & Chinese Academy of Sciences (program co-chair)
- Lina Zhou, Univ. of Maryland Baltimore County (program co-chair)

**ITS Society Sponsored Conferences**

Following are the ITS Society sponsored conferences to be held in 2009.

**2009**

July 22-24
Service Operations, Logistics and Informatics (SOLI)
Chicago, Illinois USA
[http://liu.ece.uic.edu/SOLI09/](http://liu.ece.uic.edu/SOLI09/)

August 30-September 2
Mechatronic and Embedded Systems and Applications (MESA)
San Diego, California USA

September 23-25
Vehicular Electronics and Safety (VES)
Pune, India

October 3-7
Intelligent Transportation Systems Conference (ITSC)
Saint Louis, Missouri USA
[http://www.ieee.org/itss](http://www.ieee.org/itss)

Announcements for these conferences follow.
CALL FOR PARTICIPATION

On behalf of the organizing committee, we are very pleased to invite you to the 2009 IEEE International Conference on Service Operations, Logistics and Informatics (IEEE SOLI 2009).

The technologies in service operations, logistics and informatics have been playing important roles in our modern civilization and expected to stay as main characters in the future. The conference intends to bring together all researchers and developers in these fields all around the world to share their research results, to exchange ideas and to explore possible collaborations in academy and in industry. With the tremendous work of the members of the International Program Committee, the final program has a unique set of technical sessions covering latest research and development results in service operations, logistics and informatics. It contains a number of high level theoretical papers as well as many interesting application papers.

Following the IEEE SOLI tradition, two excellent plenary talks are arranged on July 22, Wednesday morning starting at 9:45. The first talk is on “A New Mechanism for Intelligent Control of Complex Systems: Parallel Control and Management”, given by Prof. Fei-Yue Wang, Institute of Automation, Chinese Academy of Sciences, China. The second talk is on “Software for Emergency Response”, delivered by Prof. William Tepfenhart, Monmouth University, USA.

We would like to take this opportunity to thank the members of the organizing committee and the international program committee for their fantastic work. Our sincere thanks also go to many volunteers for their diligence and dedication in the preparation of this conference.

We look forward to seeing you all in Chicago!

Prof. Derong Liu
General Chair
Dr. Jim Spohrer
General Co-Chair
Prof. Daniel Zeng
General Co-Chair
Advisory Committee
Jorge Angeles, McGill University
David M. Auslander, Univ. of California, Berkeley
Kevin C. Craig, Rensselaer Polytechnic Institute
Krishna C. Gupta, Univ. of Illinois at Chicago
C. S. George Lee, Purdue University
Ren C. Luo, National Taiwan University
Bahram Ravani, Univ. of California, Davis
T. J. Tarn, Washington University
Masayoshi Tomizuka, U. of California, Berkeley
Feiyue Wang, Univ. of Arizona & Chinese Academy of Sciences

General Chair
Harry H. Cheng, Univ. of California, Davis, USA

Program Chair
YangQuan Chen, Utah State University, Logan, USA

Chair of the Honors and Awards Committee
Zuomin Dong, University of Victoria, Canada

Executive Secretariat Contact E-Mail:
09mesa@gmail.com

Symposia and Symposium Chairs

Automation and Robotics in Environmental and Agricultural Applications
Uriel A. Rosa, Univ. of California, Davis, USA

Autonomous Systems and Ambient Intelligence
Hyo-Sung Ahn, Gwangju Institute of Science & Tech., Korea

Bio-Mechatronics and Bio-sensors
Lei Zuo, SUNY Stonybrook, USA
Shane Xie, the University of Auckland, New Zealand

Cyber-Physical Systems
YangQuan Chen, Utah State Univ., USA
Xiaoqi Chen, University of Canterbury, New Zealand

Embedded Soft Computing
Riccardo Caponetto, University of Catania, Italy

Embedded System Infrastructure and Theory
Martin Horauer, UAS Technikum Wien, Austria

Learning Control and Diagnosis in Mechatronic Systems
Wen Chen, Wayne State University, USA

Mechatronics Control and Electrical Vehicles
Chengbin Ma, UM-SJTU Joint Institute, Shanghai Jiaotong Univ.

Mechatronic and Embedded System Applications
Primo Zingaretti, Polytechnic University of Marche, Ancona, Italy

Objectives
Mechanical and electrical systems show an increasing integration of mechanics with electronics and information processing. This integration is between the components (hardware) and the information-driven functions (software), resulting in integrated systems called mechatronic systems. The development of mechatronic systems involves finding an optimal balance between the basic mechanical structure, sensor and actuators, automatic digital information processing and control in which embedded systems play a key role. The field of embedded system and mechatronics is becoming evermore challenging; issues in embedded software lie at the focus of researchers both in industry and academia. The goal of this 5th ASME/IEEE MESA, MESA09, is to bring together experts from the fields of mechatronic and embedded systems, disseminate the recent advances made in the area, discuss future research directions, and exchange application experience. The conference program is organized in a number of symposia.

Paper Submission
Complete manuscripts in PDF format must be electronically submitted to the conference website: http://www.asmeconferences.org/IDETC09/

Venue
MESA09 will be held within the 2009 ASME International Design Engineering Technical Conferences (IDETC).

Important Dates
February 06, 2009: Abstract, Proposal for Special Session
February 13, 2009: Full paper due
April 24, 2009: Author Notification of Acceptance
April 24, 2009: Submission of 1903 Form (Copyright)
May 15, 2009: Submission of Final Paper
August 30, 2009: First day of conference
September 2, 2009: Last day of conference

Companion Web Site
http://iel.ucdavis.edu/mesa/MESA09/
The IEEE Intelligent Transportation Systems Society (ITSS) is sponsoring its 12th international conference on basic research and applications of leading advances in communications, computer, control, and electronics technologies related to Intelligent Transportation Systems (ITS).

**CALL FOR PARTICIPATION**

**Program Topics**

**Travel and Traffic Management**
- Travel Information and Guidance
- Ride Matching And Reservation
- Traveler Services Information
- Traffic Control
- Incident Management
- Travel Demand Management
- Emissions Testing And Mitigation
- Highway-rail Intersection
- Complex Adaptive Systems for ITS

**Public Transportation Management**
- Public Transportation Management
- En-route Transit Information
- Personalized Public Transit
- Public Travel Security

**Commercial Vehicle Operations**
- Commercial Vehicle Electronic Clearance
- Automated Roadside Safety Inspection
- On-board Safety Monitoring
- Commercial Vehicle Administrative Processes
- Hazardous Material Incident Response
- Commercial Fleet Management

**Advanced Vehicle Safety Systems**
- Collision Avoidance
- Vision Enhancement
- Advanced Safety Systems
- Automated Vehicle Operation

**Infrastructure Management**
- Health Monitoring of Bridges, Road, etc.
- Smart or Intelligent Sensor Systems

**ITS Modeling and Analysis**
- Data Mining and Analysis
- Travel Behavior under ITS
- Simulation and Modeling
- Traffic Theory for ITS
- Statistical Modeling
- Optimization and Control: Theory and Modeling
- Geographic Information Systems
- Hardware in the Loop Simulation
- Software in the Loop Simulation
- Artificial Transportation Systems

**Emergency Management and Transportation Security**
- Emergency Notification & Personal Security
- Emergency Vehicle Management
- ITS and National Security
- Parallel Management Systems for Transportation Emergency

**Other Topics**
- Imaging and Image Analysis
- Multi-Sensor Fusion
- Cooperative Systems
- Intelligent Transportation Space
- Agent-based Methods for Traffic and Vehicular Systems
- Ad Hoc Systems

**Registration Dates**
- Advanced Registration Opens: July 15, 2009
- Advanced Registration Closes: September 1, 2009
- Authors must register by and submit their final papers by August 15, 2009
ICVES – 2009

2009 IEEE INTERNATIONAL CONFERENCE ON VEHICULAR ELECTRONICS AND SAFETY

November 10-12, 2009
PUNE, INDIA

Call for Papers

The International Conference on Vehicular Electronics and Safety (ICVES) is an annual meeting sponsored by the IEEE Intelligent Transportation Systems Society (ITSS) as a forum for researchers from industry and universities to discuss research and applications in Vehicle Electronics and Safety. Papers dealing with all aspects of vehicle electronics and vehicle safety related to intelligent systems are solicited for this fourth meeting, ICVES-2009. The topics include, but are not limited to, the following:

Theme: Vehicular Electronics and Safety

Sub themes:

- Active and Passive Safety Systems
- Vehicle Hardware and Software
- Vehicular Power Networks
- Vehicle Testing
- Vehicle and Engine Control
- Vehicular Measurement Systems-Technology
- Embedded Operating Systems
- Vehicular Signal Processing Systems
- Vehicular Sensors and Sensor networks
- Image Sensors and Pattern Recognition for Vehicles
- Inter-Vehicular Communication and Telematics, X-by Wire Technology
- Micro-electromechanical Systems
- Electro Magnetic Compatibility
- Navigation and localization Systems
- Human Machine Interaction , Driver Assistance and Warning Systems
- Diagnostics
- Any other topic related to Vehicular Electronics and Safety

For more details visit http://www.icves-9.com

Dr.U.B.Desai – General Chair  ubdesai@ee.iitb.ac.in
Dr.D.J. Doke – General Co-Chair – dattadoke@hotmail.com
Dr.Y.P.Nerkar – Organizing Chair – ypnerkar@yahoo.com

Important dates:
Paper submission deadline: August, 1, 2009.
Notification of acceptance: September, 1, 2009.
Conference Calendar

by Massimo Bertozzi and Paolo Grisleri

This section lists upcoming ITS-related conferences, workshops, or exhibits. Contributions are welcome; please send announcements to itsconf@ce.unipr.it.

2009

July 8-10
3rd IEEE Multi-conference on Systems and Control (MSC2009)
Saint Petersburg, Russia
http://conf.physcon.ru/msc09/index.html

July 8-10
9th Intelligent Transport System Asia-Pacific Forum
Bangkok, Thailand
http://www.its-ap2009.in.th/

July 13-15
IASTED Control and Applications
Cambridge, United Kingdom
http://www.iasted.org/conferences/home-651.html

July 16-18
International Symposium on Transportation and Traffic Theory
Hong Kong
http://www.isttt18.org

August 23-27
National Rural ITS Conference
Seaside, OR, USA
http://www.nritsconference.org

September 2-4
12th IFAC Symposium on Control in Transportation Systems (CTS’09)
Redondo Beach, CA, U.S.A.
http://ee.usc.edu/CTS09
September 8-11
International Conference on Image Analysis and Processing (ICIAP2009)
Salerno, Italy
http://www.iciap2009.org

September 10-11
IIID Traffic&Transport 2009
Vienna, Austria
Submission due by: May 10
http://www.iiid-expertforum.net/

September 20-23
IEEE 70th Vehicular Technology Conference (VTC2009-Fall)
Anchorage, AK, U.S.A.
http://www.ieeevtc.org/vtc2009fall/

September 21-25
ITS, World Congress
Stockholm, Sweden
http://www.itsworldcongress.com

October 11-15
Saint Louis, MO, USA
http://www.iros09.mtu.edu

October 12-15
7th International Conference on Computer Vision System (ICVS2009)
Liege, Belgium
Submission due by: May 4
http://icvs2009.intelsig.be

October 20-22
9th International Conference on Telecommunications for ITS
Lille, France

November 2-4
IASTED Intelligent Systems and Control
Submission due by: June 12
Cambridge, MA, U.S.A.
http://www.iasted.org/conferences/home-665.html
November 4-7
9th International Conference on Transport Systems Telematics
Katowice-Ustroń, Poland
http://www.tst-conference.org

November 11-13, 2009
8th Chilean Congress and 3rd Ibero/American Congress on Intelligent Transportation Systems
Santiago, CHILE
Submission due by: July 10
http://www.itschile.cl

December 16-18
Artificial Intelligence Applications in Intelligent Transportation Systems
4th Indian International Conference on Artificial Intelligence
Tumkur (near Bangalore), India
http://www.iiconference.org/iicai09/its.html

2010

April 12-15
SAE 2010 World Congress
Detroit, Michigan, USA
http://www.sae.org/congress/

May 3-8
IEEE International Conference on Robotics and Automation
Anchorage, CA, USA
Submission due by: September 15, 2009
http://icra2010.grasp.upenn.edu

October 25-29
17th World Congress on ITS
Busan, South Korea
Submission due by: January 2010
http://www.itsworldcongress.kr

Abstract: Although, in recent years, significant developments have been made in road safety, traffic statistics indicate that we still need significant improvements in the field. Since traffic accidents usually reflect human factors, in this paper, we focus on clarifying the understanding of driver behaviors under hazardous scenarios. Brake pedal signals or driver speech, or both, are utilized to detect incidents from a real-world driving database of 373 drivers. Results are then analyzed to address the individuality in driver behaviors, the multimodality of driver reactions, and the detection of potentially dangerous locations. All of the existing 25 potentially hazardous scenes in the database are hand labeled and categorized. Based on the joint histograms of behavioral signals and their time derivatives, a detection feature is proposed and satisfactorily applied to the indication of anomalies in driving behavior. Seventeen scenes, where a reaction utilizing the brake pedal was observed, are detected with a true positive (TP) rate of 100% and a false positive (FP) rate of 4.1%. We demonstrate the relevance of considering behavior individuality. During 11 scenes, the drivers verbally reacted. Scenes that included high-energy words are adequately detected by the speech-based method, which achieved a TP rate of 54% for an FP rate of 6.4%. The integration of different behavior modalities satisfactorily boosts the detection of the most subjectively hazardous situations, which suggests the importance of considering multimodal reactions. Finally, a strong relationship is presented between locations where potentially hazardous situations occurred and areas of frequent strong braking.


Abstract: Recent news illustrates the frequent occurrence of pileup crashes on highways. A predominant reason for the occurrence of such crashes is that current vehicles (including those equipped with an automatic cruise control system) do not provide drivers with advance information of events occurring far ahead of them. The use of intervehicular communication to provide advance warnings to enhance automotive safety is therefore being actively discussed in the research community. In this paper, we investigate scenarios wherein only a subset of the vehicles in a multivehicle stream is equipped with such advance-warning capabilities. These vehicles (which are equipped with the capability to receive far-ahead information) are arbitrarily distributed among other unequipped vehicles that are capable of receiving only local near-neighbor information. It is seen that there are conditions wherein even a partial equipage of the system can be beneficial to both equipped and unequipped vehicles in a mixed-vehicle stream. We demonstrate this through both simulations and a theoretical analysis. We also developed a prototype of an advance-warning system and conducted road tests to test the concept. These road tests have demonstrated the system's performance to be satisfactory, subject to good communication links, for the class of scenarios tested.


Abstract: This paper presents a method of block-layout design between successive stations for mass rapid transit systems (MRTSs). The aim is to save energy under the framework of the fixed-block signaling (FBS) system and the equi-block principle. Unlike past research regarding the energy savings of train operation, this paper proposes a combinatorial optimization model to reduce the computation time. In the presented approach, the problem of mini-
mizing the energy consumption between successive stations is first formulated as a combinatorial optimization problem. Then, the train-speed trajectory for saving energy is optimized by a MAX–MIN ant system (MMAS) of ant colony optimization (ACO) algorithms. Finally, the block layout is designed in accordance with the shortest block length under the equi-block principle. It is shown that the method presents a significant improvement for the reduction of computational burden on the block-layout design. The feasibility and benefits are verified via simulation study. Analyses and discussions are also given.

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Abstract: This paper presents a multimode dynamic traffic assignment (DTA) model for the impact analysis of the bus exclusive lane. First, a multimode point-queue model is proposed to reflect the interactions of cars and buses under two scenarios: networks with and without bus exclusive lanes. To capture the travel behaviors of mode choices, departure time choices, and path choices, an integrated variational inequality (VI) formulation is proposed. Then, a heuristic algorithm is developed to solve the VI problem. Finally, based on the proposed measures of effectiveness (MOEs) of travel cost, bus passengers, and queue length, the comparison analyses in virtual networks with and without bus exclusive lanes are presented by numerical examples.

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Abstract: Existing time-series models that are used for short-term traffic condition forecasting are mostly univariate in nature. Generally, the extension of existing univariate time-series models to a multivariate regime involves huge computational complexities. A different class of time-series models called structural time-series model (STM) (in its multivariate form) has been introduced in this paper to develop a parsimonious and computationally simple multivariate short-term traffic condition forecasting algorithm. The different components of a time-series data set such as trend, seasonal, cyclical, and calendar variations can separately be modeled in STM methodology. A case study at the Dublin, Ireland, city center with serious traffic congestion is performed to illustrate the forecasting strategy. The results indicate that the proposed forecasting algorithm is an effective approach in predicting real-time traffic flow at multiple junctions within an urban transport network.

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Abstract: This paper examines a recently addressed practical variant of the capacitated vehicle routing problem (VRP) called the Capacitated Vehicle Routing Problem with 3-D Loading Constraints (3L-CVRP). This problem considers customer demand to be formed by 3-D rectangular items. Additional loading constraints often encountered in real-life applications of transportation logistics are imposed on the examined problem model. In addition to 3L-CVRP, we also introduce and solve a new practical problem version that was dictated by a transportation logistics company and covers cases in which transported items are manually unloaded from the loading spaces of the vehicles. Both problem versions are solved by a hybrid metaheuristic methodology that combines the strategies of tabu search (TS) and guided local search (GLS). The loading characteristics are tackled by employing a collection of packing heuristics. The proposed algorithm's robustness was tested for both problem versions, solving benchmark instances derived from the literature and new benchmark problems with diverse features in terms of customer set size and transported-item dimensions. It produced fine results, improving most of the best solutions that were previously reported.

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Abstract: Accurate and robust lane results are of great significance in any driving-assistance system. To achieve robustness and accuracy in difficult scenarios, probabilistic estimation techniques are needed to compensate for the errors in the detection of lane-delimiting features. This paper presents a solution for lane estimation in difficult scenarios based on the particle-filtering framework. The solution employs a novel technique for pitch detection based on the fusion of two stereovision-based cues, a novel method for particle measurement and weighing using multiple lane-delimiting cues extracted by grayscale and stereo data processing, and a novel method for deciding upon the validity of the lane-estimation results. Initialization samples are used for uniform handling of the road discontinuities, eliminating the need for explicit track initialization. The resulting solution has proven to be a reliable and fast lane detector for difficult scenarios.


Abstract: Pedestrian detection is one of the most important components in driver-assistance systems. In this paper, we propose a monocular vision system for real-time pedestrian detection and tracking during nighttime driving with a near-infrared (NIR) camera. Three modules (region-of-interest (ROI) generation, object classification, and tracking) are integrated in a cascade, and each utilizes complementary visual features to distinguish the objects from the cluttered background in the range of 20–80 m. Based on the common fact that the objects appear brighter than the nearby background in nighttime NIR images, efficient ROI generation is done based on the dual-threshold segmentation algorithm. As there is large intraclass variability in the pedestrian class, a tree-structured, two-stage detector is proposed to tackle the problem through training separate classifiers on disjoint subsets of different image sizes and arranging the classifiers based on Haar-like and histogram-of-oriented-gradients (HOG) features in a coarse-to-fine manner. To suppress the false alarms and fill the detection gaps, template-matching-based tracking is adopted, and multiframe validation is used to obtain the final results. Results from extensive tests on both urban and suburban videos indicate that the algorithm can produce a detection rate of more than 90% at the cost of about 10 false alarms/h and perform as fast as the frame rate (30 frames/s) on a Pentium IV 3.0-GHz personal computer, which also demonstrates that the proposed system is feasible for practical applications and enjoys the advantage of low implementation cost.


Abstract: The safety of the planned paths of autonomous cars with respect to the movement of other traffic participants is considered. Therefore, the stochastic occupancy of the road by other vehicles is predicted. The prediction considers uncertainties originating from the measurements and the possible behaviors of other traffic participants. In addition, the interaction of traffic participants, as well as the limitation of driving maneuvers due to the road geometry, is considered. The result of the presented approach is the probability of a crash for a specific trajectory of the autonomous car. The presented approach is efficient as most of the intensive computations are performed offline, which results in a lean online algorithm for real-time application.


Abstract: This paper presents the design and evaluation of an online passenger information system for delivering personalized multimodal trip planning services through the integration of wireless and web-based communication technologies. The goal of the system is to provide real-time travel information throughout the entire life cycle of an interurban trip. Before the full-scale deployment of this type of system, it is essential to assess its impact on the
involved stakeholders through a pilot application. The proposed system (ENOSIS) has been implemented and evaluated for supporting travel decisions in Greece. An evaluation framework for assessing the impacts of the ENOSIS system is proposed, and the evaluation results of the ENOSIS pilot application are also reported. The evaluation results provide significant evidence of the technical and operational efficiency of the ENOSIS services, while it is shown that the proposed system is cost effective.

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Abstract: In this paper, we present a new approach for detecting trucks transporting illicit radioactive materials using radiation data. The approach is motivated by the high number of false alarms that typically results when using radiation portal monitors. Our approach is a three-stage anomaly detection process that consists of transforming the radiation sensor data into wavelet coefficients, representing the transformed data in binary form, and detecting anomalies among data sets using a proximity-based method. The approach is evaluated using simulated radiation data, and the results are encouraging. From a transportation security perspective, our results indicate that the concomitant use of gross count and spectroscopy radiation data improves identification of trucks transporting illicit radioactive materials. The results also suggest that the use of additional heterogeneous data with radiation data may enhance the reliability of the detection process. Further testing with real radiation data and mixture of cargo is needed to fully validate the results.

***


Abstract: Automated vehicle control systems are a key technology for intelligent vehicle highway systems (IVHSs). This paper presents an automated vehicle control algorithm for combined longitudinal and lateral motion control of highway vehicles, with special emphasis on front-wheel-steered four-wheel road vehicles. The controller is synthesized using an online neural-estimator-based control law that works in combination with a lateral velocity observer. The online adaptive neural-estimator-based design approach enables the controller to counteract for inherent model discrepancies, strong nonlinearities, and coupling effects. The neurocontrol approach can guarantee the uniform ultimate bounds (UUBs) of the tracking and observer errors and the bounds of the neural weights. The key design features are 1) inherent coupling effects will be taken into account as a result of combining of the two control issues, viz., lateral and longitudinal control; 2) rather ad hoc numerical approximations of lateral velocity will be avoided via a combined controller–observer design; and 3) closed-loop stability issues of the overall system will be established. The algorithm is validated via a formative mathematical analysis based on a Lyapunov approach and numerical simulations in the presence of parametric uncertainties, as well as severe and adverse driving conditions.

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Abstract: In this paper, a decentralized sliding-mode control approach is applied to the control tasks of vehicles in platoons. Using the well-known bicycle model, a robust nonlinear observer is introduced to facilitate the controller design, which needs full-state measurements. The vehicles in platoons can be treated as an interconnected system with a special form. Observer gain and controller gain are properly designed. In addition, appropriate linear matrix inequality (LMI) stability conditions by the Lyapunov method are derived to ensure the stability of the system. The main advantages can be summarized as follows: 1) The linear approximation of the nonlinear vehicle model enables various advanced robust control possibilities. 2) The proposed robust control approach with the nonlinear observer ensures the convergence of the whole interconnected system, given that the system is operated within the stable region of linearization. 3) Stability conditions in the form of LMIs for both observer and controller are rigor-
ously derived. Finally, simulation results for three identical vehicles based on the relative bicycle model are demonstrated to show the performance of the approach.

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Abstract: Classically, fundamental diagrams are estimated from aggregated data at a specific location. Such a measurement method may lead to inconsistency, which mainly explains the current controversy about their shape. This paper proposes a new estimation method based on passing rate measurements along moving observer paths. Under specific assumptions, it can be proved that in congestion, the passing rate is independent of the traffic flow states. This property allows 1) proof that a linear fundamental diagram is suitable to represent traffic flow behavior involved in the Next Generation Simulation (NGSim) data set and 2) fitting of its two parameters, i.e., the congested wave speed and the jam density.

***


Abstract: The purpose of this paper is to develop rear-end collision warning thresholds with appropriate values of parameters for busses driving on freeways. Based on a bus-driving simulator, we design a simulation scenario of car following with emergency braking on freeways. Bus drivers working with a bus company are recruited to manipulate the simulation. The perception–reaction time, braking deceleration rate, and buffer of bus drivers' responses to a lead vehicle suddenly braking are collected and analyzed as parameters. Results indicate that not all the subjects have the same value in each parameter. Hence, the values of parameters in the bus rear-end collision warning threshold equations should be differentiated from various bus-driving characteristics. This paper further uses a fuzzy set theory to develop the safety membership function of each parameter and deduces 27 warning threshold equations. By these threshold equations, a rear-end collision warning algorithm for busses driving on freeways is also recommended.

***


Abstract: Overtaking is a complex and hazardous driving maneuver for intelligent vehicles. When to initiate overtaking and how to complete overtaking are critical issues for an overtaking intelligent vehicle. We propose an overtaking control method based on the estimation of the conflict probability. This method uses the conflict probability as the safety indicator and completes overtaking by tracking a safe conflict probability. The conflict probability is estimated by the future relative position of intelligent vehicles, and the future relative position is estimated by using the dynamics models of the intelligent vehicles. The proposed method uses model predictive control to track a desired safe conflict probability and synthesizes decision making and control of the overtaking maneuver. The effectiveness of this method has been validated in different experimental configurations, and the effects of some parameters in this control method have also been investigated.
Abstracts of Papers

IEEE Intelligent Transportation Systems Magazine
Volume 1, Issue 1, Spring 2009


Abstract: The recent DARPA-sponsored automated vehicle "Challenges" have generated strong interest in both the research community and the general public, raising consciousness about the possibilities for vehicle automation. Driverless vehicles make good subjects for the visually-oriented media, and they pose enough interesting research challenges to occupy generations of graduate students. However, automated vehicles also have the potential to help solve a variety of real-world problems. Engineers need to think carefully about which of those problems we are actually solving.

***


Abstract: In this paper I present a new approach to gathering data for Intelligent Transportation System applications over a continuous-flow of traffic rather than at discrete locations, as is the case with many existing technologies. Loop detectors and video cameras, among other devices, currently provide the primary means for gathering data, though it has now become possible using mobile and GPS technology to gather the speed and location of each vehicle in real-time over a continuous flow, which will allow more novel applications, such as incident identification and hazard alerts, to be developed. In addition, as vehicles transmit updated speeds to the system, the fastest path of each commuter from his current location to his desired destination can be determined. The Pre-Computed class of algorithms determines fastest paths more efficiently than existing algorithms, with the assumption that the graph edges are rather static though the weights can change frequently. Different shortest and fastest path algorithms are presented and analyzed using FreeSim (http://www.freewaysimulator.com), which contains an implementation of all of the algorithms discussed.

***


Abstract: This paper deals with the problem of ramp metering along with speed limit control of the freeway networks in order to reduce the peak hour congestion. An adaptive fuzzy control is proposed to solve the problem. To calibrate the fuzzy controller, genetic algorithm is used to tune the fuzzy sets parameters so that the total time spent in the network remains minimum. A macroscopic traffic model is used for tuning the controller in an adaptive scheme and for presenting the simulation results. The proposed method is tested in a stretch of a freeway network. To evaluate the efficiency of the method, the test results are examined and compared with traditional ALINEA controller and genetic-fuzzy ramp metering only case. The paper concludes that the proposed adaptive genetic-fuzzy control is expected to enhance the performance of the freeway traffic network control while keeping the computational simplicity of the problem.

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Qing-Jie Kong; Yikai Chen; Yuncai Liu, "A fusion-based system for road-network traffic state surveillance: a case study of Shanghai," pp. 37-42.

Abstract: The acquisition of accurate traffic states in real time is fundamental to building Urban Advanced Traveler Information Systems (UATIS). For this purpose, various sensors (e.g., loop detectors, probe vehicles, cameras, cell phones) are used to collect required traffic information. However, it is difficult to provide complete, accurate and reliable traffic information using only one type of sensor due to the various disadvantages particular to each type.
# Officers and Committee Chairs

**Officers**

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<td>VP Technical Activities</td>
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