



# INTELLIGENT TRANSPORTATION SYSTEMS

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## IEEE ITS COUNCIL NEWSLETTER

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Vol. 2, No. 1, January 2000

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Announcements, feature articles, books and meetings reviews, opinions, letters to the editor, professional activities, abstracts of reports, and other material of interest to the ITS community is solicited.

Please submit electronic material for consideration in any of the following formats: L<sup>A</sup>T<sub>E</sub>X, plain ASCII, or Word, to the Editor at [a.broggi@ieee.org](mailto:a.broggi@ieee.org) at least 1 month prior to the newsletter's distribution:

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## COUNCIL NEWS

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### From the Editor

by Alberto Broggi

Dear ITS-researcher,

we are now in our second year. The Newsletter is growing bigger and bigger with new features and we are now on our way to include also advertisements.

From last issue, besides the Postscript and PDF graphical versions, the Newsletter is available also in hypertextual format (HTML), which in the last 6 weeks has been downloaded by more than 1400 people, while the number of subscribers to this distribution list is still growing on a daily basis.

Starting from this issue, thanks to an agreement with IEEE Intelligent Systems, our Newsletter will include all the articles that appeared on that Magazine within the ITS Department, which I am honored to serve as Editor. Therefore our readers will have the opportunity to access the articles written by key people in the ITS field.

Finally, one more word from our Web-Masters: IEEE has simplified the way our CFPs will be accessible. From now on, the CFP for our main Conference –IEEE Intelligent Transportation Systems Conference, IEEE ITSC– can be found at: <http://www.ieee.org/itsc/2000>

## Calendar of Council Events

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Next Meetings are scheduled as follows:

### Council Meetings:

June 22-25, 2000 .....Sheraton Wall Center Hotel, Vancouver, BC  
during the TAB Board series, 5:45-7:30; dinner meeting.

### ITSC Officers Meetings:

February 13, 2000 .....Inter-Continental Hotel, New Orleans, LA  
November 18, 2000 .....Hyatt Regency Westshore, Tampa, FL  
during the TAB Board series.

### Other Meetings:

October 1-5, 2000 .....Ritz-Carlton Hotel, Dearborn, Michigan, USA  
ITSC-2000 and IV-2000 Conferences





## Minutes of the ITSC November 13, 1999 meeting

by Emily Sopensky

The IEEE Intelligent Transportation Systems Council met Saturday November 13, 1999 at the Snowbird Conference Center, Salt Lake City, Utah. Presiding were President, Umit Ozguner; Vice President, Ichiro Masaki ; Treasurer, Dick Klafter; Secretary, Emily Sopensky; Past President, Rye Case; ITSC2000 Chair, Toshi Fukuda.

### Amendments to the ITS Council Constitution and Bylaws (Case)

Changes to the ITS Council Constitution and Bylaws were sent in August to all member society presidents. The approved Constitution was ratified by TAB Nov 12 to be effective immediately. The office of the Treasurer is now the VP of Finance; the office of the Vice President is now the VP of Conferences; a new office, Vice President Publications, is created. Three more standing committees are created in the bylaws - Technical Activities, Long Term Planning, and Awards.

Dan Dailey is elected to the office of VP of Publications by acclamation.

### Income sources for ITS Council (Ozguner, Klafter) (Report of Blue Ribbon Panel)

With no background regarding reserves; no huge conference income; and no income yet from the transactions, Ozguner appointed a blue ribbon committee, composed of Dick Klafter, Dick Saeks, Steve Yurkovich, and Toshio Fukuda - all of whom are society presidents or past presidents, to give some guidance to the Council. Klafter distributed a spreadsheet that resulted from the committee's discussions and assumptions, explaining that it is a work in progress and he will keep all posted. The 2001 conference is projected to have a 30K surplus. We should expect to lose money on the transactions the first few years. APP income will not be available for first 3 years of the transactions so is not included in the spreadsheet.

Discussion ensued of the need to build the transactions presence and mailing list.

### Committee reports

- Conferences and Meetings (Masaki)

Masaki reported that the recent ITSC99 conference in Tokyo, which generated a \$10K surplus for the Council.

**ITSC2000:** The conference is budgeted to have a 25K surplus. Scheduled for Oct 1-3 with IV following Oct 5-6 at the same site. Toshi notes that we need publicity. March is the deadline for the call for papers. Rye will distribute call for papers in Toronto. Hashimoto will be circulating it to about 70-60. March 1 is the deadline for papers. In four months, Fukuda will meet with Petros at USC. Case thinks society reps should also be responsible for circulating the CFP. Herget asks about the VNIS mailing list. Fukuda notes that 10,000 copies were printed and Dailey has posted it on the web. Klafter asks all reps to put an announcement in your society magazine. Drozd asks that the progress of meetings be reported in the newsletter. Masaki will meet with him afterwards.

**2001DD:** Pravin Varaiya is general chair. An exhibitions chair and a local arrangements chair have been appointed. Budget has been okayed. On the program side, representatives from Hong Kong, China, Germany and France are needed. Need more people for the review committee.

**IV2001:** The ITS Council Conference Committee concluded that any decisions about combining or keeping separate ITSC conferences and the IV symposiums should be postponed until the end of 2000 when experience with the two options could be compared.



- Publications (Dailey)  
Transactions. 27 papers have been received. So far, 4 have been accepted. Creation of the subscriber list is the hardest task.  
Broggi, the newsletter editor, is working with the Computer Society magazine. Bob French contributed an article on the history of ITS that will be published soon. To give the Council more exposure, the strategy is to place and write articles for other society magazines. French requests society reps email info on the their society's publications. Ozguner suggests a micromagazine that could be inserted in other society magazines. Klafter notes that it is better to have it in magazines for archival purposes.
- Finance (Klafter) (Present status)  
Klafter discussed the carryover of \$25,000, which was the gift from TAB to start the transactions. The Council has limited expenses partly because Ozguner used discretionary funds to pay for his travel instead of the Council's funds. The bad news is that the Council has not spent anything on advertising the transactions. Dan is going to actively work on it now. \$10,000 in 99. 2000 at 10,000 2001 and 10,000. All have to work hard to make the transactions viable.
- Standards Committee. Little activity until Jan 2000
- Other activities, including ad hoc committees (Ozguner, et al) (Long term Planning Committee)
  - Long Term Planning Committee (Herget).  
Herget discussed several items that related to the Long Term Planning Committee's meeting earlier today. The committee recommended that Ozguner appoint a chair for the Awards committee. Also need TAB approval and guidelines. Start the process for having awards for the 2001 conference. The following motion was approved:  
*To establish an IEEE ITS Council Best Paper Award for ITS plaque and monetary award, and an IEEE ITS Council Student Best Paper Award plaque and monetary award. Plaques will be given, starting in 2001. Awards will be supported by the conferences. The Awards Committee will decide winners. The same awards would be given for IV.*
  - Technical Activities Committee (Ozguner)

Ozguner presented his vision:

- \* Organizing topical workshops / meetings
- \* Organizing session at our *flagship* conference
- \* Coordinating co-sponsorship with other society conferences
- \* Facilitating special issues per the transactions
- \* Maintaining database of interested individuals

Future:

- \* Newsletters
- \* Speakers
- \* Other. Activities to be reviewed after two years; decide on contribution after 3 years.
- \* Initial Technical Subcommittees (Reflecting existing initiatives and proactive thrust in new areas) Intelligent Road Vehicles, Communication Systems, Air Traffic Control, Railways, Image Processing/Sensors, Transit

The council votes to recommend that the President appoint a chair.

#### ITSC meetings in 2000. (Ozguner)

- Excom: Feb 12, New Orleans
- Excom (teleconference): July
- Full Council and all committees: Sept 30, Dearborn, MI



- Excom: Nov 18, Tampa, FL

### New business

Sopensky presents gavel to Ozguner for use as President of the Council in the Year 2000.

Ozguner announces that Avni will be leaving the Council. Thanks him for his years of work putting the Council together.

Drozd is investigating web-based programs for technology and non-traditional advertising. He is collecting info for action in the middle of next year. Doubleclick is partnering. By February he will have a preliminary report.

**Adjourned at 10:05pm**



## The IEEE and ITS

by Robert French

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# The IEEE and ITS

Robert L. French, R&D French Associates

*Reprint of the article appeared on  
IEEE Intelligent Systems, Nov/Dic 1999, p.75-77*

This article highlights the IEEE's role in shaping the Intelligent Transportation Systems movement, which sprouted during the '60s, lay partly dormant during the '70s, blossomed during the '80s, and started bearing fruit with its many deployments throughout the world during the '90s. I also outline the mission of the IEEE's new ITS Council for coordinating ITS interests among the numerous IEEE societies whose scope includes technologies used for implementing ITS functions and services.

### ITS background

Intelligent transportation systems is an umbrella term that covers the application of a wide variety of computer, communication, positioning, sensing, control, and other information-related technologies to improve the efficiency, safety, and environmental aspects of surface transportation. Major categories of ITS include traffic-management systems (for example, adaptive traffic signals, automatic incident detection, electronic toll collection, and emission sensing) and traveler information systems (for example, pretrip planning, motorist information, and dynamic route guidance).

ITS also include systems for public transportation (automatic vehicle location, signal preemption, smart cards for fare collection, dynamic ride sharing, and so on) and for commercial-vehicle operations (fleet management, weigh in motion—weighing trucks as they travel, automatic vehicle classification, international-border crossing, and so on). Safety-related ITS include intelligent cruise control, collision warning, collision avoidance, night vision, and platooning. Other examples of ITS include automatic Mayday signaling, coordinated emergency response, and signal preemption for emergency vehicles.



Automated in-vehicle route-guidance systems based on mechanical principles were on the market in the US around 1910; vehicle-actuated traffic signals debuted in 1928; and a concept for automated highway systems was shown at the 1939 World's Fair. However, by any practical measure, the ITS movement didn't take root until the '60s, when the first computer-controlled traffic signals and changeable message signs appeared. A US research project established concepts in the late '60s for dynamic route guidance based on real-time traffic conditions, but was canceled by Congress before testing.

Tests of similar dynamic systems occurred in both Japan and Germany in the '70s. That decade also brought the microprocessor and the beginning of GPS development and testing. Although these technologies were not associated with ITS at the time, they are now major components of many ITS systems. Thus, many of the underlying concepts and basic technologies for ITS were in place for the flurry of government-subsidized and industry-funded development programs that got underway in the mid '80s in Europe—for example, Drive and Prometheus—and Japan—for example, RACS (Road/Automobile Communication System) and Amtics (Advanced Mobile Traffic Information and Communications System).

In the late '80s, Mobility 2000, an informal organization, spurred ITS in the US. Mobility 2000 laid the groundwork for the formation in 1990 of ITS America (originally called IVHS [Intelligent Vehicle Highway Systems] America). ITS America is a public-private forum for consolidating national ITS interests and promoting international cooperation in ITS. The IVHS Act of 1991 then formalized the US ITS program and funded development through 1997. By the late 1990s, the main focus of ITS programs around the world had shifted to largescale integration and deployment.

## IEEE involvement

The following selected highlights illustrate the IEEE's past and continuing involvement in the ITS movement.

**Publications.** The transactions and other publications of numerous IEEE societies have contained occasional papers or articles related to individual ITS technologies. However, special issues of Transactions on Vehicular Technology gave a comprehensive snapshot of ITS developments in the February 1970, May 1980, and February 1991 issues. The cover article of the May 1991 IEEE Spectrum was a special report on ITS.

Besides these occasional articles, the IEEE ITS Council has established two publications devoted to ITS:

- Newsletter of the ITS Council. Edited by Alberto Broggi of the University of Pavia, this electronic newsletter has been posted quarterly at the IEEE ITS Council's Web site ([www.ieee.org/its](http://www.ieee.org/its)) since January 1999. Individual e-mail subscriptions to the newsletter are also available at the Web site.
- IEEE Transactions on ITS. Edited by Chelsea C. (Chip) White III of the University of Michigan, this quarterly refereed journal is slated to start publication in March 2000. It will focus on the design, analysis, and control of information technology as it is applied to transportation systems. The call for papers is posted on the ITS Council Web site.

**Conferences.** Individual conferences of several IEEE societies have included papers and even entire sessions on ITS—for example, the Plans (Position-Location and Navigation Systems) Conference of the Aerospace & Electronic Systems Society. However, certain IEEE conferences have focused exclusively on ITS since 1989.

The Vehicular Technology Society originated the Vehicular Navigation and Information Systems Conference in 1989 in Toronto, which was the world's first ITS conference. The VNIS conferences were subsumed by the Intelligent Transportation Systems Conference series, starting with ITSC '97 in Boston. The ITSC series was started by the IEEE Ad Hoc Committee on ITS (the ITS Council's predecessor) and has been continued by the council.

Starting with ITSC '99, held in Tokyo from 5 to 8 October, the ITSC became annual. A major objective of the series is to focus more strongly than other conferences on cutting-edge-electronics-based technologies and their implications for ITS. The next ITSC will be from 1 to 3 October 2000 in Dearborn, Michigan. The call for papers is at the ITS Council Web site.

Another IEEE conference series devoted exclusively to ITS is the Intelligent Vehicles Symposium, which the Industrial Electronics Society originated in the early '90s. IV now continues under the ITS Council's



auspices. The next symposium, which focuses on basic research and present and future applications for intelligent vehicles and intelligent infrastructures, will be from 4 to 5 October 2000 in Dearborn. The call for papers is at the ITS Council Web site.

**Standards.** In July 1991, the IEEE Standards Board approved the establishment of an ITS Standards Coordinating Committee. Known as SCC32, the committee became the 16th IEEE committee for coordinating standards in specific technology areas. Its scope reads as follows:

*SCC32 shall be responsible for coordinating, developing, and maintaining standards, recommended practices, and guidelines related to Intelligent Transportation Systems (ITS) within the scope of IEEE interests. SCC32 shall work with other national and international standards writing bodies to coordinate area of involvement.*

Recent standards developed by SCC32 include

- 1455-1999: Standard for Message Sets for Vehicle/Roadside Communications.
- 1489-1999: Standard for Data Dictionaries for Intelligent Transportation Systems.

SCC32 projects at the ballot stage include

- P1488: Standard for Message Set Template (MST) for Intelligent Transportation Systems.
- P1512: Standard for Common Incident Management Message Sets for Use by Emergency Management Centers.

Detailed information on SCC32 is available at its Web site: [grouper.ieee.org/groups/scc32](http://grouper.ieee.org/groups/scc32).

### The IEEE ITS Council

On 1 January 1999, the IEEE ITS Council joined ranks with the 37 Societies and Technical Councils that constitute the 320,000-member IEEE. The ITS Council is scientific, literary, and educational in character. Its purpose is to advance and coordinate ITS activities throughout the IEEE. Its field of interest includes the theoretical, experimental, and operational aspects of electrical and electronics engineering and information technologies as applied to ITS. The council will further its work by

- publishing appropriate periodicals,
- sponsoring IEEE ITS-related conferences and conference sessions,
- sponsoring IEEE Press publications, and
- pursuing other activities in its field of interest.

**Background.** The ITS Council culminates an effort that began in 1993 when, at the Vehicular Technology Society's urging, several IEEE Societies with ITS interests banded together under the Technical Activities Board to create the cross-cutting Ad Hoc Committee on ITS. Although the IEEE is the world's largest professional organization, it previously had no unified vision of its role in the ITS movement. With the exception of SCC32, the IEEE's ITS interests before forming the ad hoc committee had been scattered among individual activities of the semiautonomous IEEE societies. A major concern both inside and outside the IEEE was the lack of a single point of contact for coordinating with non-IEEE ITS activities. For example, unlike other major engineering societies such as the American Society of Civil Engineers, the Institute of Transportation Engineers, and the Society of Automotive Engineers, the IEEE was not a member of ITS America, until after the ad hoc committee resolved at its organizational meeting to seek empowerment to become a member on behalf of the IEEE.

The committee focused early on ITS conference activities, starting with a special session on the IEEE's role in ITS that it organized for the First ITS World Congress, in Paris in 1994. In conjunction with VNIS and IV, the committee organized approximately 10 sessions for the Third ITS World Congress, in Orlando in 1996. The committee soon pursued plans to become a permanent IEEE entity. They successfully petitioned



the Technical Activities Board for council status, a rarity in the IEEE (the Neural Networks Council is the only other IEEE Council).

**Membership and organization.** Unlike IEEE Societies, an IEEE Council does not have individual members. Instead, the membership comprises individual IEEE Societies that demonstrate interest in ITS technical activities and agree to share responsibility for all the council's obligations. The ITS Council's founding members include these societies:

- Aerospace & Electronic Systems
- Antennas & Propagation
- Communications
- Computer
- Consumer Electronics
- Control Systems
- Electromagnetic Compatibility
- Electron Devices
- Industrial Electronics
- Instrumentation & Measurement
- Microwave Theory & Techniques
- Power Electronics
- Professional Communication
- Reliability
- Robotics & Automation
- Signal Processing
- Systems, Man & Cybernetics
- Vehicular Technology

Additional societies may become members upon application and approval by the ITS Council.

Each member society appoints two representatives to serve on the ITS Council. In addition to funds allocated by the council's member societies, the council derives financial support from subscription sales of council publications, any surplus from conferences that it organizes or sponsors, and other sponsored activities. The council is governed by a president, vice president, secretary, and treasurer, elected annually. For additional details on the ITS Council, visit its Web site.

The IEEE has had significant roles in ITS since the movement's earliest days. With its ITS Council now in place, the IEEE is positioned to be an important ITS player in the new millennium.

## References

1. R.L. French et al., *A Comparison of IVHS Progress in the United States, Japan & Europe through 1993*, Report IVHS AMER-94-5, Intelligent Transportation Soc. of America, Washington, D.C., 31 Mar. 1994.
2. "IEEE SCC32-Standards Coordinating Committee on Intelligent Transportation Systems (ITS)," IEEE, Washington, D.C.; [grouper.ieee.org/groups/scc32](http://grouper.ieee.org/groups/scc32) (current 20 Oct. 1999).





## CFP: IEEE Transactions on Intelligent Transportation Systems

by Chip White

### IEEE Transactions on Intelligent Transportation Systems

#### Call for Papers

The IEEE Intelligent Transportation Systems Council (ITSC) announces a new transactions journal, the IEEE Transactions on Intelligent Transportation Systems. The first quarterly issue will appear in March 2000.

Improved planning, design, management, and control of future transportation systems requires conducting both basic and applied research to expand the knowledge base on transportation. The new IEEE Transactions on ITS will focus on the design, analysis, and control of information technology as it is applied to transportation systems. Topics to be considered will include, but will not be limited to:

- Sensors (infrastructure & vehicle-based)
- Communications (wide area & vehicle-to-roadside)
- Man-Machine Interfaces (displays, artificial speech)
- Decision Systems (expert systems, intelligent agents)
- Simulation (continuous, discrete, real-time)
- Reliability & Quality Assurance
- Imaging and Image Analysis
- Information Systems (databases, data fusion, security)
- Computers (hardware, software)
- Control (adaptive, fuzzy, cooperative, neuro, large systems)
- Technology Forecasting & Transfer
- Systems (engineering, architecture, evaluation)
- Signal Processing
- Standards.

Transportation systems are usually large-scale in nature and are invariably geographically distributed. The complexity of transportation systems arises from many sources. Transportation systems can involve humans, vehicles, shipments, information technology, and the physical infrastructure—all interacting in complex ways. Many aspects of transportation systems are uncertain, dynamic and nonlinear, and such systems may be highly sensitive to perturbations. Controls can involve multiple agents that are distributed and hierarchical. Personnel who invariably play critical roles in a transportation system have a diversity of objectives and a wide range of skills and education.

Despite such complexity, the emergence of new technologies—such as sensors, communications, low-cost, faster computation, and new control and optimization algorithms—provides new opportunities to substantially improve efficiency, safety and environmental impact. With the use of these technologies, new and faster measurements are possible and more data can be managed and processed. Additionally, new strategies for management and control will be developed to deal with both the static and the dynamic nature of transportation systems. So, while most of the classical transportation problems raised in the past continue to exist, there now are new approaches with which to contend.

The intent of the IEEE Transactions on ITS will be to serve as a forum for the technological aspects of information technology to transportation, thus providing researchers with an outlet for publication.



For further publication guidelines, contact the editor at [ccwiii@umich.edu](mailto:ccwiii@umich.edu) or by call 734-764-5723. Please send five (5) copies of your manuscript for possible publication to:

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## Report on IEEE Trans. on Intelligent Transportation Systems

by Chip White

### IEEE Transactions on Intelligent Transportation Systems Editor's Report, 12 January 2000

Though the publication of the first issue will be delayed due to the difficulties in starting up a new journal, the number of paper submissions and inquiries about the ITS Transactions appears to be increasing since October, 1999. There have been 30 manuscripts submitted as of 12 January 2000. Two papers have been recommended for acceptance so far, an additional paper is almost ready for acceptance, and three papers have been recommended for resubmission. The breakdown for the number of papers received per month is depicted in the following table. Publication decisions for completed reviews are also listed according to the month in which the papers were received.

Year	Month	No. of Papers Received	Accept	Not Quite Ready	Resubmit	Reject	Not Appropriate
1999	January	0					
1999	February	2		1			
1999	March	5	1		1	1	
1999	April	1					
1999	May	6			1	3	1
1999	June	1					
1999	July	1	1				
1999	August	1			1		
1999	September	1					
1999	October	2					
1999	November	5					
1999	December	2					
2000	January	3					

In an effort to decrease the turn-around time for reviews, Associate Editors have been sent requests for status reports for papers with overdue review decisions via e-mail. The review process for some papers is taking longer than hoped. The Associate Editors are being encouraged to complete the process for outstanding reviews as soon as possible.



In our continuing effort to publicize the IEEE Transactions on ITS, we are in the process of sending email copies of the Call for Papers and Information for Authors to attendees of the ITS World Congress held in Toronto in October 1999.



## Announcement and CFP for ITSC-2000

by Toshio Fukuda

### ITSC 2000

The 3rd Annual IEEE Conference on Intelligent Transportation Systems  
*The Ritz-Carlton Hotel, Dearborn, MI, USA*  
*October 1-3, 2000*

The IEEE Intelligent Transportation Systems Council (ITSC) is sponsoring a professional-level conference on basic research and on the applications of leading-edge advances in communications, computers, control and related electronics-based technologies to Intelligent Transportation Systems (ITS).

#### Program Topics:

Sensors (infrastructure & vehicle-based), Communications (side area & vehicle-to- roadside), Simulation (continuous, discrete, real-time), Man-machine Interfaces (displays, artificial speech), Control (adaptive, fuzzy, cooperative neuro), Decision Systems (expert systems, intelligent agents), Systems (engineering, architecture, evaluation), Information Systems (databases, data fusion, security), Computers (hardware, software), Reliability & Quality Assurance, Navigation and Guidance System, Signal Processing, Technology Forecasting & Transfer, Imaging and Image Analysis, Vehicle Control, Standards , Traffic theory in ITS, Routing and Route Guidance, Transit applications and Air traffic control.

#### Paper Submission:

Five (5) copies of complete manuscripts must be submitted no later than March 1, 2000 at the following address:

Prof. Petros A. Ioannou, PC Chair, ITSC-2000  
Center for Advanced Transportation Technologies, University of Southern California  
3740 McClintock Avenue, Suite 200B Los Angeles, CA 90089-2562, USA  
Tel: +1-213-740-4473, Fax: +1-213-740-4449, E-mail: [ioannou@rcf.usc.edu](mailto:ioannou@rcf.usc.edu)

Submitted papers must be no longer than six (6) pages in IEEE two-column format (US letter size), including figures and references. Papers exceeding this length limit may be rejected without review. The cover sheet should include (1) the title of the paper, (2) the names of the authors, (3) the technical categories, and (4) the name, mailing address, telephone and fax number, and e-mail address of the contact author. Details on the electronic paper submission can be found on the website below. Notification of Acceptance is scheduled for **May 1, 2000**.



**Important Dates:**

Paper and Tutorial submission deadline ..... March 1, 2000  
 Notification of acceptance ..... May 1, 2000  
 Camera-ready copy due ..... July 1, 2000

**All Correspondences should be addressed to:**

Prof. Toshio Fukuda, General Chair, ITSC-2000  
 Center for Cooperative Research in Advanced Science and Technology  
 Nagoya University  
 Furo-cho, Chikusa-ku, Nagoya 464-8603, JAPAN  
 Tel: +81-52-789-4478, Fax: +81-52-789-3909  
 E-mail: itsc2k@mein.nagoya-u.ac.jp

**More Information will be available at**

<http://www.ieee.org/itsc/2000>

The IEEE Intelligent Vehicles Symposium (IEEE IV 2000) will be held at the same location on Oct. 4-5, 2000, and a single –reduced rate– registration option will be available for both Conferences, as well as individual registrations. Same papers may not be submitted to both the IV and ITSC Conference. More information will be available at <http://www.ce.unipr.it/iv2000>

**Organizing Committee:**

General Chair:.....Prof. Toshio Fukuda Nagoya University  
 Program Chair:.....Prof. Petros Ioannou University of South California  
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   Emily Sopensky, ITS





## Announcement and CFP for IV-2000

by Alberto Broggi

### IV 2000 IEEE Intelligent Vehicles Symposium 2000 *The Ritz-Carlton Hotel, Dearborn, MI, USA October 4-5, 2000*

The IEEE Intelligent Transportation System Council (ITSC) is sponsoring a professional-level conference on basic research on present and future applications for Intelligent Vehicles and Intelligent Infrastructures. Papers dealing with **vehicle-centered intelligent systems** are solicited. This symposium is characterized by a single session format so that all the attendees remain in a single room for multilateral communications in an informal atmosphere. As another tradition, the meetings have enthusiastic participation from industry, as well as research centers and universities.

The IEEE Conference on Intelligent Transportation Systems (ITS) will be held at the same location on Oct. 1-3, 2000, and a single –reduced rate– registration option will be available for both Conferences, as well as individual registrations.

#### TOPICS

- Driver Assistance Systems
- Navigation/Guidance Systems
- Information Systems
- Traffic Monitoring and Control
- System Architectures
- Imaging and Vision Enhancement
- Human-machine Interfaces
- Communications and Networks
- Sensors
- Vehicle Control
- Active Safety
- CAN

#### PAPER SUBMISSION

Prospective authors are invited to submit a paper in electronic form (Postscript) by **March 1st, 2000** for peer review, following the submission guidelines available at: <http://www.ce.unipr.it/iv2000>

Submitted papers must be no longer than six (6) pages in IEEE two-column format, including figures and references. Papers exceeding this length limit may be rejected without review. The first page should include (1) the title of the paper, (2) the names of the authors, (3) the technical categories, and (4) the name, mailing address, telephone and fax number, and e-mail address of the contact author. Same papers may not be submitted to both IV and ITSC conferences.

#### SPECIAL SESSIONS

##### ◇ Military Applications and Current Research

**Theme:** This session will provide an opportunity to explore research and development activities for autonomous and semi-autonomous ground vehicle systems. It examines the technology requirements and operational capabilities of robotic vehicle programs for military, and commercial applications. The session brings together technologists to discuss needs, opportunities and approaches for adapting commercial automotive intelligent systems to meet military off-road autonomous applications. The conference provides a unique opportunity to identify commercial research projects and leverage the results to meet crucial military requirements.



**Topics:** Government and Commercial programs: technical and performance challenges, system performance, test results, lessons learned; Machine perception for navigation and mission execution; Vehicle mobility and motion control; Operator interface and human-robot interactions.

**Organizer:** Bruce Brendle, U.S. Army Tank-automotive & Armaments Command,  
brendleb@tacom.army.mil

◇ **Autonomous Driving on Extreme Courses**

**Theme:** This session is concerned with research and advanced development for autonomous vehicle guidance in extreme driving environment. Coping with such conditions is a prerequisite for the introduction of advanced driver assistance functions. Hence, a discussion of the requirements and approaches to meet with these challenging conditions is expected to enhance insight into future developments, reveal missing links between current research and realization and provide impetus for new activities. The session will gather experts from various disciplines to shed light on the topic from different views.

**Topics:** system architecture, multisensor systems, advanced vehicle control, driving strategy formation, self-assessment, reliability and safety, driving robot.

**Organizer:** Christoph Stiller, Robert Bosch GmbH, Germany,  
christoph.stiller@de.bosch.com

◇ **User Interfaces for On-Board Systems**

**Theme:** This session will focus on user interfaces issues in vehicle-centered intelligent systems and will feature experiences from the usability engineering perspective. Issues include, for instance, feedback, integration, synchronization, context, and how to make the most value from devices within vehicles: many of these are also issues for stand-alone systems, but mobility adds extra problems and opportunities. Those attending the session will be able to learn from and establish contacts with researchers who are innovators in developing human-computer interfaces.

**Topics:** feedback, feedthrough, integration, synchronization, context, multimodality, design, prototyping, evaluation, empirical studies.

**Organizer:** Mauro Mosconi, University of Pavia, Italy,  
mosconi@vision.unipv.it

◇ **Vehicle Motion Control Systems**

**Theme:** This session will focus on control systems for autonomous vehicle motion. Longitudinal and lateral control strategies of car-like vehicles will be presented and the tight interplay with sensing systems (vision and nonvision based) will be highlighted. This session solicits methodology contributions as well as experimental results.

**Topics:** automatic steering control, sensing systems, visual guidance, image dynamics estimation, trajectory generation, supervisory control, advanced control systems design.

**Organizer:** Aurelio Piazzi, University of Parma, Italy,  
aurelio@CE.UniPR.IT

◇ **Autonomous Vehicles Cooperation and Coordination**

**Theme:** Cooperation and coordination of activities and actions are fundamental tasks when more than one agent is involved to accomplish a complex common goal. During the last few years several projects has been started on such topic. Among others, the European Handshaking (part of Prometheus Project) subproject where automobiles exchange information to better organize traffic flow; the Japanese rescue project for intervention of autonomous (robots) vehicles during catastrophic events; the international RoboCup initiative where a team of autonomous indoor vehicles (robots) have to coordinate its actions to implement a common strategy to compete against another team following the soccer rules. The goal of the workshop is to focus on indoor and outdoor autonomous vehicles cooperation and coordination issues and related topics.





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NON-COUNCIL ITS NEWS

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**CFP: ISATA 2000: Automotive & Transportation Technology**

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by Mark Bursa

ISATA 2000  
Automotive & Transportation Technology  
*CALL FOR PAPERS*  
*Dublin, Ireland 25-29 September 2000*

**Abstract Due Date:** 31st January 2000

ISATA is a well-established and highly respected global conference and exhibition for automotive and transportation technology.

Its strong reputation, established over the past 30 years, means ISATA every year attracts a large audience of senior executives from major vehicle manufacturers and Tier 1 and 2 suppliers - most of whom directly specify or significantly influence purchasing decisions on the technology of today and tomorrow.

We are looking for the best technical papers, on the cutting edge of technology, to be selected for our refocused and expanded programme of conference tracks.

Please visit our web-site for further details of ISATA 2000, its 14 Simultaneous Programme Tracks, and submission of abstracts:

<http://www.isata.com>

For more information, please contact:

ISATA, Ground Floor, Epsom House,  
10c East Street, Epsom, Surrey,  
KT17 1HH, UK  
Tel: +44 (0)1372 720620, Fax: +44 (0) 1372 720101  
E-mail [enquiries@isata.com](mailto:enquiries@isata.com)



## SPIE Enhanced and Synthetic Vision 2000

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by Jacques Verly

### TECHNICAL PROGRAM

SPIE, Orlando, 24-28 April 2000  
 ENHANCED AND SYNTHETIC VISION 2000

Conference Chair: Jacques G. Verly, MIT Lincoln Laboratory

#### Program Committee:

**Andrew K. Barrows**, Stanford University;  
**Alberto Broggi**, Universita' di Pavia (ITALY);  
**Ernst D. Dickmanns**, Univ. der Bundeswehr Muenchen (GERMANY);  
**Peter Hecker**, DLR (Germany);  
**Thomas J. Meitzler**, U.S. Army Tank-Automotive and Armaments Command;  
**Jeffrey D. Radke**, Honeywell Technology Ctr;  
**Jens Schiefele**, Darmstadt University of Technology (GERMANY);  
**Harro von Viebahn**, VDO-Luftfahrtgeraete Werk (GERMANY).

#### Monday 4/24/2000

##### SESSION 1: AVIATION APPLICATIONS (I)

- Chairs: Harro von Viebahn, VDO-Luftfahrtgeraete Werk (GERMANY) Jeffrey D. Radke, Honeywell Technology Ctr Jacques G. Verly, MIT Lincoln Laboratory
- 01:10 Progress on HeliRadar development: HeliRadar 2000+ offers increased performance and opens the market, Dr. Wolfgang Kreitmair-Steck (HeliRadar Technologies GmbH, GERMANY), Aribert Wolframm (DaimlerChrysler Aerospace, GERMANY), Harald Daller (Eurocopter Deutschland, GERMANY)
  - 01:30 Obstacle Detection and Warning System for Helicopters Using Image Sensors, Kazuo Yamamoto, Kimio Yamada (Electronic Navigation Res. Inst., Ministry of Transport, JAPAN)
  - 01:50 Helicopter Obstacle Detection Radar System, Lev S. Sadovnik, Vladimir A. Manasson, Robert M. Mino (WaveBand Corporation)
  - 02:10 On obstacle detection and warning system for aircraft navigation in airports, Laurent Gallo (Aerospatiale Matra Missiles, FRANCE) Pierre Coldefy (Aerospatiale Matra Airbus, FRANCE)
  - 02:30 Navigation through fog using stereoscopic active imaging, Wendell R. Watkins, David H. Tofsted, V. Grayson CuQlock-Knopp (US Army Research Laboratory), Jay B. Jordan (New Mexico State University), John O. Merritt (Interactive Technologies)
  - 02:50 MMW Radar Based Navigation: Solutions of the "Vertical position Problem", Bernd Korn, Hans-Ullrich Doehler, Peter Hecker (German Aerospace Center - DLR, GERMANY)
  - 03:10 COFFEE BREAK (3:10 - 3:40)

##### SESSION 2: AVIATION APPLICATIONS (II)



- Chairs: Jens Schiefele, Technical University Darmstadt (GERMANY); Andrew K. Barrows, Stanford University; Jacques G. Verly, MIT Lincoln Laboratory
- 03:40 Controlled Decimation of Digital Elevation Data and Subsequent In-Flight Verification, Thorsten Wiesemann, Jens Schiefele, Ludwig May (Darmstadt University of Technology, GERMANY), Felix Mehler (DaimlerChrysler Aerospace AG, GERMANY), Wolfgang Kubbat (Darmstadt University of Technology, GERMANY)
- 04:00 Certifiable Database Generation for SVS, Jens Schiefele (Darmstadt University of Technology, GERMANY), Dejan Damjanovic (Jeppesen-Sanderson Inc.), Wolfgang Kubbat (Darmstadt University of Technology, GERMANY)
- 04:20 Virtual Cockpit Window for the X-38 Crew Return Vehicle, Frank Delgado (NASA Johnson Space Center), Scott Altman (Astronaut Office, NASA/JSC), Mike Abernathy, Janis White (Rapid Imaging Software)
- 04:40 An evolutionary Synthetic Vision Display approach: The enhanced Navigation Display (eND), Jens Schiefele, Kai Engels, Thorsten Wiesemann (Darmstadt University of Technology, GERMANY)

**Tuesday 4/25/00****SESSION 3: AVIATION APPLICATIONS (III)**

- Chairs: Peter Hecker, DLR (GERMANY) Jens Schiefele, Technical University Darmstadt (GERMANY); Jacques G. Verly, MIT Lincoln Laboratory
- 08:20 An Integrated Navigation, Flight Guidance and Synthetic Vision System for Low Level Flight Felix E. Mehler (DaimlerChrysler Aerospace AG, GERMANY)
- 08:40 A system for Synthetic Vision and Augmented Reality in Future Flight Decks Reinhold Behringer, Venkataraman Sundareswaran, Clement Tam, Joshua McGee, Marius Vassiliou (Rockwell Science Center)
- 09:00 Uniform, Integrated Cockpit Access to Heterogeneous Flight Data Thorsten Wiesemann (Darmstadt University of Technology, GERMANY), Christian Och (University of Colorado), Jens Schiefele (Darmstadt University of Technology, GERMANY) Rick Osborne (University of Colorado) Wolfgang Kubbat (Darmstadt University of Technology, GERMANY)
- 09:20 Cockpit Emergency Safety System Leo Keller (OPTREL AG, SWITZERLAND)
- 09:40 Real-time image processing for aircraft detection during flight Jeffrey W. McCandless (NASA Ames Research Center), Octavia I. Camps, Lee D. Coraor, Tarak L. Gandhi, Rangachar Kasturi, Mau-Tsuen Yang (Pennsylvania State University)
- 10:00 COFFEE BREAK (10:00 - 10:30)

**SESSION 4: COMPARISON OF IMAGING MODALITIES**

- Chairs: Jeffrey D. Radke, Honeywell Technology Ctr Harro von Viebahn, VDO-Luftfahrtgeraete Werk (GERMANY) Jacques G. Verly, MIT Lincoln Laboratory
- 10:30 Fusion of 2-/3-/4-Sensor Imagery for Visualization, Target Learning and Search, A. Waxman, D. Fay, D. Ireland, J. Racamato, W. Ross, W. Streilein, M. Braun, and M. Aguilar (MIT Lincoln Laboratory)
- 10:50 Relevant Spatial Frequency Information in the Texture Segmentation of Night-Vision Imagery, Michael J. Sinai, J. Kevin DeFord, Todd J. Purkiss, Edward A. Essock (University of Louisville)
- 11:10 Evaluation of Algorithms for Fusing Infrared and Synthetic Imagery, Philippe Simard (McGill University, CANADA), Norah K. Link and Ronald V. Kruk (CAE Electronics Ltd, CANADA)
- 11:30 Comparison of Response Time for Visible and IR Imagery As A Function of Contrast and Noise, Thomas Meitzler (US Army TACOM), Gregory Smith, Samuel Ebenstrein, Yelena Rodin (FORD Research Laboratories)
- 11:50 Runway based infrared sensor for enhanced vision of approaching aircraft, John Lester Miller, J. Richard Kerr (FLIR Systems) Ralph Smith (US Navy)
- 12:10 LUNCH (12:10 - 1:10)

**SESSION 5: AUTOMOTIVE AND ROBOTIC APPLICATIONS**

- Chairs: Thomas J. Meitzler, U.S. Army Tank-Automotive and Armaments Command Alberto Broggi, Università di Pavia (ITALY) Jacques G. Verly, MIT Lincoln Laboratory
- 01:00 The Night Driving Training Aid (NDTA): Developmental Issues and Lessons Learned, John W. Ruffner, Kim G. Woodward (DCS Corporation)
- 01:20 Road Recognition for a Tracked Vehicle, Michael Luetzeler (University of the Federal Armed Forces Munich, Germany), Stefan Baten (Dornier GmbH, DaimlerChrysler, GERMANY)
- 01:40 Extended Terrain Reconstruction for Autonomous Vehicles, Garbis Salgian, Robert Mandelbaum, Harpreet Sawhney, Michael Hansen (Sarnoff Corporation)
- 02:00 A neural based system for obstacle detection and scene reconstruction, Andrea Zanela, Sergio Taraglio (ENEA - C.R. Casaccia, ITALY)
- 02:20 Scene Interpretation and Behavior Planning for Driver Assistance, Uwe Handmann, Iris Leefken (Ruhr-Universitaet Bochum, GERMANY)
- 02:40 Real-Time Image Processing Algorithms for Vehicle and Pedestrian Detection, Alberto Broggi, Stefano Nichele, Stefano Pace (Università di Pavia, ITALY) Massimo Bertozzi, Alessandra Fascioli (Università di Pavia, ITALY)
- 03:00 COFFEE BREAK (3:00 - 3:30)

### SESSION 6: MISCELLANEOUS TOPICS

- Chairs: Alberto Broggi, Università di Pavia (ITALY) Thomas J. Meitzler, U.S. Army Tank-Automotive and Armaments Command Jacques G. Verly, MIT Lincoln Laboratory
- 03:30 Image based view synthesis for enhanced perception in teleoperation, Paul Cohen, Jean-Sebastien Perrier, Gady Agam (Ecole Polytechnique, Montreal, CANADA)
- 03:50 Combining Computer Graphics and Computer Vision for Probabilistic Visual Robot Navigation, Benno Heigl, Joachim Denzler, Heinrich Niemann (University of Erlangen-Nuremberg, GERMANY)
- 04:10 A multi-agent architecture for scene interpretation, Fabienne Ealet (Aerospatiale and DCE/CTA/GIP, FRANCE), Bertrand Collin (DCE/CTA/GIP, FRANCE), Genevieve Sella (Aerospatiale, FRANCE), Catherine Garbay (Laboratoire TIMC-IMAG, FRANCE)
- 04:30 Integrated radar-photometry sensor based on constrained optical flow, Paul Cohen, Youenn Fablet, Gady Agam (Ecole Polytechnique, Montreal, CANADA)
- 04:50 Feature Based Image Registration and Mosaicing, Weilin Song, Han Wang (Nanyang Technological University, SINGAPORE)
- 05:10 The Detector-Based Visual Identification of Known Objects, Georgii Khachaturov (Universidad Autonoma Metropolitana, MEXICO)
- 05:30 Statistical Model of Driver Behavior, Nuria Oliver (Massachusetts Institute of Technology)

### POSTER PRESENTATIONS

- o Sector Imaging Radar for Enhanced Vision (SIREV): Theory and Applications, Thomas Sutor, Stefan Buckreuss, Michael Wendler, Franz Witte (Deutsches Zentrum fuer Luft- und Raumfahrt (DLR) e.V., GERMANY)
- o Sector Imaging Radar for Enhanced Vision (SIREV): Simulation and processing techniques, Michael Wendler, Stefan Buckreuss, Josef Mittermayer, Alberto Moreira, Thomas Sutor (Deutsches Zentrum fuer Luft- und Raumfahrt (DLR) e.V., GERMANY)
- o HMD Fast Jet Flying Test Results, Stefan Becker, Peter Sandl (DaimlerChrysler Aerospace AG, GERMANY)

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## Transport Visions: A Young Professionals' Perspective

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by Glenn Lyons

### Transport Visions: A Young Professionals' Perspective

It is now over a year since the publication of the long awaited UK Transport White Paper 'A New Deal for Transport - Better for Everyone'. This set out a new policy approach towards transport. The mindset of 'predict and provide' has been broken. However it would be unwise to move into a new era in which new mindsets are established and the virtues of fundamental transport policy are no longer questioned. It is vital that we continue to challenge current thinking and that alternative visions of possible transport futures are examined.

Contributions to the transport debate and to transport vision documents have come predominantly from the ranks of senior professionals. Conspicuous by its absence is the presence of views from young professionals. Yet the young professionals of today will be the decision makers responsible for the shaping of transport at the beginning of the next millennium.

The British National Committee of the World Road Association (PIARC) recognised the potential value of inviting young professionals to set out their visions of the future. It organised an essay competition for teams of young professionals under the title of 'Transportation and Infrastructure in the 21st Century'. The competition grew to become an international initiative with over 50 essays submitted from several countries. The team from the Transportation Research Group (TRG) at the University of Southampton won the UK competition and was selected as one of the four international winners alongside teams from Finland, France and Malaysia. The winning teams presented their visions at the 1999 World Road Congress in Kuala Lumpur.

The success of the essay competition highlighted the value of harnessing the views of young professionals from a range of backgrounds. The TRG successfully applied for funds from the Engineering and Physical Sciences Research Council (EPSRC) to establish and co-ordinate a Transport Visions Network for Young Professionals. The Network formally begins on 1st February 2000 and will run for a period of 30 months. Network members will be addressing a series of transport themes and a number of thematic vision documents will be produced.

Whether a transport planner, geographer, engineer, economist, market researcher, sociologist, psychologist, if you are under 35 and able to contribute imaginative, forward thinking views concerning factors that should or could shape the future of transport then you are the type of person the Transport Visions Network needs. Joining instructions and further information can be found on the TRG Web site (<http://www.trg.soton.ac.uk>) under 'research'. Enquiries can also be made to the Network Director, Dr Glenn Lyons on 023 8059 4657 (email [G.Lyons@soton.ac.uk](mailto:G.Lyons@soton.ac.uk)). The December 1999 issue of 'Traffic Engineering and Control' provides a more detailed account of this new initiative in a paper titled 'Transport Visions: A Young Professionals' Perspective'.

The inaugural meeting of the Transport Visions Network is being hosted by the Transport Planning Society (<http://www.tps.org.uk>) and is taking place on 16 February 2000 at the Institution of Civil Engineers, London.



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## PhD scholarship in the perceptual and biomechanical constraints on driving performance

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by Paul Treffner

### PhD scholarship in the perceptual and biomechanical constraints on driving performance

School of Physiotherapy & Exercise Science,  
Griffith University, Gold Coast, Australia

The School of Physiotherapy & Exercise Science, Griffith University, Gold Coast, seeks applications from well-qualified persons for a PhD scholarship to investigate the perceptual and biomechanical constraints on driving performance. Funding will be provided for 3 years (\$21,080 per annum) of full-time PhD study. The applicant must be an Australian citizen or a permanent resident and should have either an Honours 1 or high 2.A undergraduate degree, or have considerable research experience from industry in a relevant area.

The project is funded by an Australian Research Council SPIRT (Strategic Partnerships in Industry - Research and Training) grant and is in collaboration with the Performance Driving Centre (PDC), Norwell, QLD. Using biomechanical and dynamical analysis techniques, the research will investigate how perception and action are tightly coordinated during the task of automobile driving, and how drivers can learn to drive more safely and effectively. Experiments will be undertaken at PDC's driver-training track in Mercedes vehicles instrumented to collect relevant performance variables. Of particular interest will be issues related to the relation between postural stability, optical information, and control. The successful PhD candidate should have knowledge and interest in issues of motor control, coordination, and skill, and/or knowledge in biomechanics and instrumentation for the collection of behavioural data. The project is under the supervision of Dr Paul Treffner (motor control) and Mr Rod Barrett (biomechanics). The candidate will be required to enroll in full-time PhD studies at Griffith University in the School of Physiotherapy & Exercise Science. The successful applicant will have reasonable travel and relocation expenses reimbursed and will be provided with a vacation allowance.

Please submit a CV before the closing date of February 14th 2000, and direct any further enquiries to Paul Treffner.

For further details, please see: Web: <http://www51.gu.edu.au/staff/treffner/driving.html>

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