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Information for contributors
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: LATEX, plain ASCII, PDF, or Word, to the Editor at broggi@ce.unipr.it at least 1 month prior to the newsletter’s distribution:

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Dear Colleagues,

Just a few words to keep you updated on the status of our newsletter. It is now distributed to over 11,000 e-mail addresses, and more are coming on a regular basis. From this issue, we have installed an accounting system that will allow us to count the number of accesses to our electronic newsletter. Multiple accesses via cache/proxy systems will be counted as well; last issue was accessed 2618 times (excluding cached copies).

Anyone interested in adding new information to the Newsletter and the two sections related to web sites and conferences (as well as special issues of interest to our community) is welcome to contact the e-mail addresses specified in the introduction of each section.

Again, I encourage you to contact me via e-mail at broggi@ce.unipr.it regarding ideas and suggestions on how to improve our Newsletter, the main IEEE sponsored means of communication among ITS researchers.

Dear Colleagues,

It is fall once more and time for the annual ITSC meeting. This year’s meeting is in Singapore, September 3-6, and promises to be very interesting. The emphasis on ITS activities is particularly striking in Asia, and with the upcoming 2008 Olympics in China many ITS projects are either starting or are underway. Singapore is one of the most wired nations on earth and ITSC2002 will have a variety of tours and demonstrations of operating large scale ITS systems in addition to the high quality technical sessions that typify the ITSC meetings. As always, delegates from every continent will be reporting on the newest and most wide ranging ITS activities worldwide. Last year I reported that ITSC2001 had delegates from every continent except Antarctica. This resulted in the newsletter editor commenting to me that next year he would be reporting on remotely controlled snow cats operated in Antarctica and we would have covered all the continents! I look forward to hearing about ITS in Antarctica!

You can find more information on the program and tours at: http://www.ieee.org/itsc/2002.

I hope you will join us in Singapore at the premier technical conference on ITS in the world today.
An Automated Gas Station Attendant

by Shiu Kit Tso, Ka Lun Fan, Yongde Zhang, and Chun Man Chan

An Automated Gas Station Attendant

Reprint of the article appeared on IEEE Intelligent Systems, March-April 2002, p.84–87

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Having to staff a gasoline station with human attendants at night or in remote rural areas poses several potential difficulties, including health hazards and security problems. To eliminate the need for attendants in such situations, we have designed and developed a laboratory prototype of an automatic petrol-refueling station (see Figure 1). Our APS incorporates a user terminal, refueling robot, sensing system, and motion control system. It aims to provide automatic, intelligent, fast, and convenient 24-hour automobile refueling.

The user terminal

The terminal provides a simple user interface consisting of a smart card system, keyboard, monitor, and printer. After inserting a smart card into the smart-card reader, the user keys in a password and selects the kind and amount of fuel. The user can check...
the smart card’s records and updated status. During refueling, the monitor displays the procedure’s progress. The printer outputs a receipt after the APS completes the refueling. In addition, the terminal features an emergency key so that the user can stop the robot immediately. The robot resets automatically after the user releases the key.

In a deployed system, the terminal would be designed for outdoor use, and the user would be able to access it while seated in the car. Both the smart-card reader and the computer would need to be protected from possible abuse.

![Figure 1: The laboratory setup of our APS (automatic petrol-refueling station) prototype.](image1)

The robot

An end effector connected to the robot’s wrist holds the gas pump nozzle and moves it to the parked car’s gas tank opening. After the APS determines the opening’s inclination, the wrist adjusts the nozzle’s pitch and yaw to prepare it for insertion. Figure 2 shows the end effector inserting the nozzle into the tank opening. (As a separate development to simplify refueling, we have built a combined gas tank lid and cap that lets the nozzle enter the tank opening without unscrewing the cap.)

A Cartesian frame with three independent axes carries the end effector. Each of the frame’s three sliding, prismatic wrist joints can change its coordinates without affecting the other two axes’ coordinates. The end effector is attached to the end of the z-axis, whose extensible length is 800 millimeters. Because the z-axis is arranged horizontally, this joint must bear the maximum bending moment when fully extended. The maximum loading at the z-axis joint’s tip is 10 kilograms. This axis has three sections and is driven by a ball screw. If the axis were divided into more than three sections, the last section’s diameter might be too small, thus decreasing the joint’s strength. The Cartesian frame and wrist joints together provide five degrees of freedom, which are useful for adjusting the nozzle when inserting it into the tank.

![Figure 2: The end effector inserts the gas pump nozzle into the gas tank opening.](image2)

Sensing

Our APS uses four types of sensing devices: infrared sensors, a flow sensor, a force/torque sensor, and a vision system. A microcontroller controls all the sensors (except for the vision system) and integrates all the sensor signals. It sends the data in an appropriate format through an RS-232 interface to the main computer. The microcontroller also controls the gasoline valve and the counter displays, which show the gas output and price.

Infrared The APS employs two IR displacement sensors—one (IR-1) in the end effector and the other (IR-2) fixed on one side of the frame (see Figure 3). These sensors roughly but quickly estimate the gas tank opening’s location.

Imagine that a driver has parked a car in front of the robot. First, IR-2 checks the clearance between the car and the robot, then reports whether the car is in the acceptable area. (If the car is not properly parked, the computer will issue a warning statement at the terminal to the driver. The robot will not perform any action until the car is properly parked.)
To shorten the time searching for the opening, the APS then moves the end effector (with IR-1) toward the rear of the car. (In Hong Kong, gas stations normally operate with single-file traffic flow—that is, in one way, out the other. So, the system does not need to determine which end is the car’s front and which is the rear.) Starting from one end of the robot, the end effector moves horizontally at approximately one meter above ground to search for the car body. The search range is up to 1,000 mm wide and 800 mm long. The APS can use IR-1’s and IR-2’s range readings to calculate the car’s parking angle (see Figure 4). This gives the yaw angle for the z-axis wrist. If the yaw angle is within the acceptable range, the end effector will move to the opening’s rough location.

**Vision** The vision system precisely locates the gas tank opening. The APS uses a vision system because it is the most flexible choice for this purpose. First, a 2/3-inch CCD (charge-coupled device) camera captures an image of the tank’s opening. With this camera, the APS can obtain a precise measurement from an image with over 400,000 pixels. However, the environment’s brightness level can affect image quality. A relatively dark environment will increase image noise; a light source originating from the side of the opening will generate a large shadow. To solve such problems, the end effector carries an artificial light source. When the camera takes the image, the light turns on to eliminate shadows and improve image contrast.

On the basis of the image, the APS determines the opening’s position and orientation. It converts this data to the robot frame’s global coordinates, which the microcontroller uses to drive the joints to the required positions.

**Force/torque** During the entire refueling process, a force/torque sensor at the z-axis wrist gives feedback signals to aid motion control and to avoid damaging the car.

**Flow** The flow sensor measures the quantity of gasoline delivered.

**Motion control**

The robot’s five degrees of freedom comprise the three linear motions (x, y, and z) for the frame and two rotational motions (pitch and yaw) for the end effector. The APS subdivides motion control into frame control and end effector control. If the car parks in the expected space, the gas tank opening’s position and orientation will lie within a reasonable range. We can also limit the range of the five DOFs to suitable values. For the prototype, X is 1,200 mm, Y is 800 mm, Z is 1,900 mm, pitch is 200° and yaw is 150°.

A programmable logic controller executes the x-, y-, and z-axis control. The APS sends the computed coordinates and speed to the PLC, which then controls the frame’s three AC motors via three inverters. An encoder on each motor monitors the motor’s position, which it sends back to the PLC.

Two DC servomotors drive the end effector. A controller card controls them, and a current amplifier supplies their power. The controller card contains a PD (proportional-derivative) controller for each motor.

Moreover, the controller card uses the signals from the force/torque sensor to apply both force control to the x, y, and z motions and stiffness control (with suitable force control gains) to the pitch and yaw motions.

We developed our APS to be a more or less immediate solution that provides the essential functions...
and assumes minimum alteration to current cars. Its basic concept is similar to other systems. However, unlike the others, it does not use transponders, and it exploits force sensing. The APS’s simple but robust mechanical system design lends itself to outdoor use with minimum maintenance requirements. We plan to make our system safer by replacing the DC motors at the wrist with pneumatic motors.

Besides eliminating the problems associated with human gas station attendants, automatic refueling systems can assist drivers who are unable or unwilling to handle gas pump nozzles. Such features augur these systems’ eventual popularity. However, for this prediction to come true, researchers must develop highly reliable, safe, and secure systems.

Acknowledgments
We are grateful to the Research Grants Council, Hong Kong SAR, for providing a Central Allocation grant supporting several service robot projects.

Other Robotic Refueling Systems

European engineers have been working on refueling robots since the late ’80s. In France, Robosoft (www.robosoft.fr) has developed Oscar, a robotic refueling system for buses. Using several sensors and a transponder mounted to a floor panel, Oscar automatically positions itself close to the gasoline tank cap.

German researchers have also developed several robotic refueling systems. In 1993, Anton Bauer GmbH designed and constructed Robin (www.ipa.fhg.de/srdatabase/robin.html), like Oscar, to refuel buses. Also like Oscar, Robin uses a transponder to obtain a bus’s geometrical data as it enters the lane for refueling. To scan the position of the bus’s gasoline tank cap, the transponder, its associated sensors, and the manipulator move on rails parallel to the bus’s longitudinal axis. Five inductive distance sensors help Robin precisely adjust the gas pump nozzle.

The Fraunhofer Institute for Manufacturing Engineering and Automation (Fraunhofer IPA), in conjunction with BMW and Mercedes-Benz, has designed a robotic refueling device for automobiles (www.ipa.fhg.de/information/Daten&Ereignisse/euro_inno.php3 [in German]). Unlike other systems, this one can establish a solid connection between the nozzle and the gas tank opening. A set of cameras detects the car’s exact position (especially the gas tank cap), and laser scanners monitor the robot’s workspace. The IPA claims that this system can remove 95 percent of the toxic vapor and can refill a car with liquid hydrogen [1].

In Northern Europe, Sweden is one of the pioneering countries to install robotic refueling systems at stations throughout the countryside. In 1991, Autofill Europe (www.autofil.se [in Swedish]) developed the Autofill system. Autofill consists of a pump, a robotic manipulator with three prismatic joints, and a user terminal connected to the station’s main computer. A transponder, fitted with various types of sensing modules, transmits vehicle data (for example, dimensions) to Autofill. Guided by a camera and other sensors, the manipulator positions the nozzle in front of the lid. A vacuum gripper opens the lid. Distance sensors help Autofill accurately reposition the nozzle before guiding it into the gas tank opening.

Calendar of Council Events

by Charles J. Herget

Next Meetings are scheduled as follows:

**ITS Executive Committee Meetings:**

September 2, 2002 (am)  
Singapore during IEEE ITSC 2002

**ITS Council Meetings:**

September 2, 2002 (1:00 pm – 4:00 pm)  
Singapore International Convention & Exhibition Centre, during IEEE ITSC 2002

February 15, 2003 (6:30 pm – 9:30 pm)  
Fairmont Hotel, Dallas, Texas, USA

October 7, 2003 (1:00 pm – 4:00 pm)  
Shanghai, China during IEEE ITSC 2003

**IEEE Intelligent Transportation Systems Conference:**

September 3–6, 2002  
Singapore International Convention & Exhibition Centre, Singapore

October 8–10, 2003  
Shanghai, China

**IEEE Intelligent Vehicles Symposium:**

May 15–17, 2003  
Columbus, Ohio, USA

June 15–18, 2004  
Parma, Italy
Report on the IEEE Intelligent Vehicles Symposium 2002
by Michel Parent

The 2002 session of the IEEE International Conference on Intelligent Vehicles took place on the week of June 17-21 in Versailles. The conference returned to France for the second time and it took place, quite appropriately, in the heart of French automotive research. Although Versailles is well known for its palace and rich history, it is also the epicentre of the automotive industrial research for Renault, Peugeot-Citroen, Matra, Thales and many others, as well as numerous public and university research organisations.

As it is now customary, the event included three major parts:

- a tutorial session organised by Professor Claude Laurgeau of Ecole des Mines de Paris, which took place on June 17 at INRIA,
- the scientific conference which was organised by a scientific committee under the leadership of Dr Uwe Franke from DaimlerChrysler and which took place in the congress center of Versailles on June 18-20,
- a demonstration of advanced vehicles organised by Dr Jean-Marc Blosseville of the LIVIC, and which took place on the private tracks of the GIAT in Versailles-Satory on June 20-21.

The overall chairman of the event this year was Dr Michel Parent from INRIA.

This year, the conference was at a turning point with several products that we dreamt of ten years ago now available on production cars including adaptive cruise control, electronic stability program, lane keeping assistant, collision warning. Yet more is to come, with parking assistance, stop&go, intelligent speed adaptation, platooning,...

Researchers have dreamt of fully autonomous vehicles platooning at high speed on automated highways, and have demonstrated that the technology is viable. Is this still a dream or will it come true one day? Many think that the difficulties are enormous, but it would be foolish to predict what might happen in the next twenty years. However, this year’s conferences and demonstrations have presented several fully autonomous vehicles, called cybercars, which are already on the market. These vehicles are still far from our dream automobile that anyone can use to go anywhere, anytime, at any speed. They are restricted to operate at low speed in controlled environments, but could they be the precursors of the future automated highway vehicles?

The tutorials were attended by 48 participants while more than 300 registered participants attended the scientific conference. The two keynotes speech given by Professor Ernst Dickmanns (with a broad overview of vision systems for autonomous driving) and by Dr Tsugawa (on communications for cooperative driving) were particularly well attended. The demonstrations on the last days attracted about 500 visitors including a large participation from the media. For more pictures, see http://www-rocq.inria.fr/imara/iv2002.
Call for Participation: IEEE ITSC 2002, Sept 3-6, Singapore

by Der-Horng Lee

The IEEE 5th International Conference on Intelligent Transportation Systems (ITSC2002) is to be held in Suntec Singapore International Convention & Exhibition Centre from 3-6 September 2002. Forty technical sessions, one workshop, two tutorials, and five technical tours will be presented to conference participants.

ITSC2002 proudly announces that Mr. KHAW Boon Wan, Senior Minister of State, Ministry of Transport, Republic of Singapore, will be the Guest-of-Honour of the opening ceremony and to deliver the opening address.

The Conference is also proud to present four plenary speeches. The plenary speakers are:

- Pravin Varaiya, Nortel Networks Distinguished Professor, University of California, Berkeley
- Dr. Sadayuki Tsugawa, ITS Research Group Leader, National Institute of Advanced Industrial Science and Technology (AIST), Japan
- Dr. Christian Laugier, Research Director at INRIA, Head of SHARP Project
- Mr Han Eng Juan, Chief Executive, Land Transport Authority, Singapore

Information about the conference, program, registration and accommodation is available online at http://www.itvs.eng.nus.edu.sg/itsc2002

Information about Singapore is available at http://www.newasia-singapore.com/

Any inquiry regarding IEEE ITSC2002 should be directed to conference secretary:

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On behalf of ITSC2002 Organizing Committee, I look forward to seeing you all in Singapore.
CFP: IEEE Intelligent Vehicles Symposium 2003

by Umit Ozgüner

1st ANNOUNCEMENT

IV 2003
IEEE Intelligent Vehicles Symposium
Columbus, OH, USA, June 9-11, 2003

CALL FOR PAPERS. The Intelligent Vehicles (IV) Symposium is one of two professional meetings annually sponsored by the IEEE Intelligent Transportation System Council. IV is an open forum on basic research, present and future applications for Intelligent Vehicles and Intelligent Infrastructures. 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. Papers dealing with all aspects of vehicle-related intelligent systems and cooperation between vehicles and infrastructures are solicited for IV2003.

TOPICS
Driver Assistance & Inform. Systems
Driver monitoring
Infrastructure Intelligence
Special Automated Road Vehicles
Impact on Traffic Flows

System Architectures
Imaging and Vision
Human-machine Interfaces
Communications and Networks
Impact on Drivers

Sensors
Vehicle Control
Active Safety
AHS

PAPER SUBMISSION Prospective authors are requested to send an extended abstract by e-mail, preferably through the Web page no later than December 1st, 2002.

The extended abstract must be 2 to 4 pages including figures with enough detail for review for content and appropriateness. A separate cover page should include (1) the title of the paper, (2) the name of the authors, (3) the name, mailing address, telephone and fax number, and e-mail address of the contact author.

Special session organization is encouraged. Organizers should contact Dr. Sadayuki Tsugawa with a proposal by November 1st, 2002.

TUTORIAL and TOURS Tutorial sessions and tours are going to be held on June 8 (Sunday).

DEADLINES
Extended Abstracts due for review
Organized Session Proposal
Notification of acceptance
Camera-ready full paper for proceedings due

December 1st, 2002
November 1st, 2002
February 1st, 2003
April 1st, 2003

UP-TO-DATE INFORMATION
Please refer frequently to the following website http://eewww.eng.ohio-state.edu/~umit/IV2003 for the most up-to-date information or contact the General Chair/Conference Secretariat (IV2003@ee.eng.ohio-state.edu).

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IEEE Transactions on Intelligent Transportation Systems

Editor’s Report, 25 July 2002

Paper submissions to date have increased over last year. To date, we have received double the number of papers through July of 2002.

Vol. 3, No. 2, June 2002, which was late going to press, should be out at the end of July.

Vol.3, No.3 of the Transactions has been sent to the publisher and should be published on time. This is a special issue of papers presented at IV 2001 in the area of Intelligent Control and Sensing in IV. We would like to thank the Guest Editors, Prof. Katsushi Ikeuchi, Dr. Masataka Kagesawa, and Shunsuke Kamijo, for their excellent work on the special issue.

Prof. Petros Ioannou has proposed a special issue on Adaptive Cruise Control Systems. A Call for Papers will be published in the June issue of the Transactions, space permitting.

We would like to thank everyone again for his or her patience with us during the our transition to our new city and my new position. Please call problems to our attention so that we can correct them as soon as time allows.

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Vehicle Control Algorithms for Cooperative Driving with Automated Vehicles and Inter-Vehicle Communications, by Shin Kato, Sadayuki Tsugawa, Kiyohito Tokuda, Takeshi Matsui, and Haruki Fujii

Abstract: This paper describes the technologies of the cooperative driving with automated vehicles and inter-vehicle communications in the Demo 2000 cooperative driving. The cooperative driving, aiming at the compatibility of safety and efficiency of road traffic, here means that automated vehicles drive by forming a flexible platoon over a couple of lanes with a short inter-vehicle distance while performing lane changing, merging, and leaving the platoon. The vehicles for the demonstration are equipped with automated lateral and longitudinal control functions with localization data by the DGPS and the inter-vehicle communication function with 5.8 GHz DSRC designed for the dedicated use in the demonstration. In order to show the feasibility and potential of the technologies, the demonstration was held in November, 2000 on a test track with 5 automated vehicles. The scenario included stop & go, platooning, merging and obstacle avoidance.

Artificial Vision in Extreme Environments for Snowcat Tracks Detection, by Alberto Broggi and Alessandra Fascioli

Abstract: This paper describes the image processing techniques designed to localize tracks of snowcats for the automation of goods and people transportation during the Italian scientific missions in Antarctica. The final goal is to enable a snowcat to automatically follow the preceding one in a train-like fashion.

A camera is used to acquire images of the scene; the image sequence is analyzed by a computer vision system which identifies the tracks and produces a high level description of the scene. This result is then forwarded to a further software module in charge of the control of the snowcat movement. A further optional representation, in which markers highlighting the tracks are superimposed onto the acquired image, is transmitted to a human supervisor located off-board.

This system has been tested in the Italian test site and is currently under testing in the South Pole during the early 2002 Italian scientific mission. The paper briefly describes also an alternative solution based on an evolutionary approach.

Fast Obstacle Detection for Urban Traffic Situations, by Uwe Franke and Stefan Heinrich

Abstract: The early recognition of potentially harmful traffic situations is an important goal of vision based driver assistance systems. Pedestrians, in particular children, are highly endangered in inner city traffic. Within the DaimlerChrysler UTA (Urban Traffic Assistance) project, we are using stereo vision and motion analysis in order to manage those situations. The flow/depth constraint combines both methods in an elegant way and leads to a robust and powerful detection scheme. A ball bouncing on the road often implies a child crossing the street. Since balls appear very small in the images of our cameras and can move considerably fast, a special algorithm has been developed to achieve maximum recognition reliability.

An Obstacle Detection Method by Fusion of Radar and Motion Stereo, by Takeo Kato, Yoshiyuki Ninomiya, and Ichiro Masaki
Abstract: In order to avoid collision with an object that blocks the course of a vehicle, measuring the distance to it and detecting positions of its side boundaries, are necessary. In this paper, an object detection method achieved by the fusion of millimeter wave radar and a single video camera is proposed. We consider the method is the least expensive solution because at least one camera is necessary for lane marking detection. In the method, the distance is measured by the radar, and the boundaries are found from an image sequence, based on motion stereo technique with help of the distance measured by the radar. Since the method does not depend on the appearance of objects, it is capable of detecting not only an automobile but also other objects. Object detection by the method was confirmed through an experiment. In the experiment, both a stationary and a moving object were detected, and a pedestrian as well as a vehicle was detected.

• An Algorithm for Distinguishing the Types of Objects on the Road Using Laser Radar and Vision, by Noriko Shimomura, Kazumi Fujimoto, Takahiko Oki, and Hideo Muro

Abstract: This paper describes a method for distinguishing the types of forward objects detected on and alongside the road using a vehicle-mounted scanning laser radar (SLR) and a camera. This method can measure the distance to a preceding vehicle in the same lane as well as to other forward vehicles in adjacent lanes. Objects are detected on the basis of SLR digital signal data and are categorized as vehicles, delineators and signs based on their motion and positions relative to white lane markers. The motions of detected objects are judged by the relationship between the path of the host vehicle and changes in the positions of the objects. The host vehicle’s path is computed using steering maneuver data and the vehicle velocity. White lane markers are detected by an image processing technique. The proposed algorithm has been validated in an experiment conducted with a simulator. Data recorded at a driving speed of more than 40 km per hour on Japanese expressways were used in the simulation. The types of objects detected on the road were successfully distinguished as expected.

• Distance Range Based Segmentation in Intelligent Transportation Systems: Fusion of Radar and Binocular Stereo, by Yajun Fang, Ichiro Masaki, and Berthold Horn

Abstract: Dynamic environment interpretation is of special interest for intelligent vehicle systems. It is expected to provide lane information, target depth, and the image positions of targets within given depth ranges. Typical segmentation algorithms cannot solve the problems satisfactorily, especially under the high-speed requirements of a real-time environment. Furthermore, the variation of image positions and sizes of targets creates difficulties for tracking. In this paper, we propose a sensor fusion method that can make use of coarse target depth information to segment target locations in video images. The idea is to split an edge map of a binocular image into N edge layers corresponding to N given target depth information so that different layers contain the edge pixels of targets at different depth ranges. In this way, the original multiple-target segmentation task is decomposed into several simpler and easier single-target segmentation tasks on each depth-based target feature layer, thus improving the segmentation performance. Coarse depth ranges can be provided by radar systems or by a vision-based algorithm introduced in the paper. The new segmentation method offers more accuracy and robustness while decreasing the computational load.

• Development of Night Vision System, by Takayuki Tsuji, Hiroshi Hattori, Masahito Watanabe, and Nobuharu Nagaoka

Abstract: A night vision system has been developed to help reduce vehicle-pedestrian accidents occurring at night. High-temperature objects assumed to be pedestrians are detected by processing the images from infrared stereo cameras mounted on the vehicle, and the possibility of a collision is judged by calculating the position and relative moving vectors of the pedestrian. In addition, voice guidance is provided and a highlighted infrared image of the pedestrian is displayed at the bottom of the front windshield using a head-up display (HUD). It was determined that the system could judge the possibility of collisions with pedestrians on the road or crossing the road.
Call for Papers

IEEE Transactions on Intelligent Transportation Systems

The IEEE Intelligent Transportation Systems Council publishes the IEEE Transactions on Intelligent Transportation Systems. Professor Chip White of the Georgia Institute of Technology is the editor. Improved planning, design, management, and the control of future transportation systems requires conducting both basic and applied research to expand the knowledge base on transportation. The IEEE Transactions focuses on the design, analysis, and control of information technology as it is applied to transportation systems. Topics to be considered include, but are not be limited to:

- Imaging and Image Analysis
- Reliability & Quality Assurance
- Technology Forecasting & Transfer
- Signal Processing
- Computers
- Standards
- Sensors
- Communications
- Decision Systems
- Man-Machine Interfaces
- Information Systems
- Simulation
- Control
- Systems

The intent of the IEEE Transactions on ITS is 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 cwhite@isye.gatech.edu or by calling 404-894-2307.

Please send five (5) copies of your manuscript for possible publication to:

**Chelsea C. White, III, Editor**
Georgia Freight Bureau Chaired Professor in Transportation & Logistics
Georgia Institute of Technology
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765 Ferst Drive
Atlanta, George 30332-0205 U.S.A.
phone 404-894-2307  fax 404-894-2301
cwhite@isye.gatech.edu

For more information, including a list of Associate Editors and their areas of expertise, see the IEEE ITSC web pages at www.ieee.org/itsc/trans.html.
Announcing a new way to access the latest research in intelligent transportation systems

A New Publication from the IEEE

The IEEE Council on Intelligent Transportation Systems has announced the publication of a new journal — The IEEE Transactions On Intelligent Transportation Systems. The journal will serve as a forum for the technological aspects of applications of information technology to transportation. Published quarterly, the Transactions presents quality, peer-reviewed research on a wide range of topics.

Meeting The Needs of Today’s Transportation Engineer...

Improved planning, design, management and control of future transportation systems of the next century will require that fundamental, long-term research be conducted in order to expand the transportation knowledge base. Transportation systems professionals need to be educated to satisfy the evolving workplace requirements. To help address these needs, the IEEE Council on ITS has launched the Transactions to focus on the design, analysis and control of information technology as applied to transportation systems.

Transactions On Intelligent Transportation Systems

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IEEE Transactions on Intelligent Transportation Systems
Special Issue On Adaptive Cruise Control Systems

Adaptive Cruise Control (ACC) or Intelligent Cruise Control Systems as often referred to are finding their way into the market. These systems form a significant step towards vehicle automation and their success will determine the speed with which future more advanced systems will be deployed providing additional automatic features for passenger and possibly commercial vehicles. The effects of ACC on vehicle following, traffic flow characteristics, environment, human response, driver comfort and safety are very crucial for the future success of ACC as well as for their development to more advanced systems.

The purpose of this special issue is to bring together experts in the field to present their most recent results on ACC in a single journal.

Potential topics to be considered are:

- Design, Analysis and Implementation of ACC Systems
- Effect of ACC systems on traffic flow characteristics
- Effect of ACC systems on the environment
- Human factors issues associated with ACC
- Safety issues associated with ACC
- Advanced ACC systems that may include collision avoidance systems
- Cooperative ACC systems
- ACC systems for commercial vehicles

The authors are invited to submit papers on any of the above topics. The papers should be written in accordance to the standards and format of the IEEE Transactions on Intelligent Transportation Systems. Seven copies of the paper should be submitted before September 10, 2002 to:

Petros Ioannou, Guest Editor
Center for Advanced Transportation Technologies
EE-Systems, MC2562, EEB200B
University of Southern California
Los Angeles, CA 90089

The submitted papers will be sent out for review and decisions will be made according to the following schedule:

Paper Submission Deadline: September 10, 2002
Completion of Review Process: November 10, 2002
Revised Papers for Publication Due: December 10, 2002
Final Manuscripts Due: No Later than December 31, 2002
Expected publication: March 2003
Papers, which do not pass the first review process or require extensive modifications that may not be feasible within the time limits indicated above, would be encouraged for revision and resubmission as regular papers.

Disruptive? Technology?

by Emily Sopensky

By all appearances, becoming the Dean of The Wharton School (University of Pennsylvania, Philadelphia, Penna., USA) is neither disruptive nor has anything to do with technology.

But Patrick T. Harker, who is the 12th Dean of the school, came to this position two years ago and disrupted a certain way of doing things.

First of all, he is young. He is only 43.

Second, he is an insider. He’s been at Penn since the late Seventies.

Then, too, he is a college prof, not a professional administrator or fundraiser.

But most interestingly, he is an engineer, whose discipline focuses on transportation issues.

A faculty member for 15 years, Harker has held numerous leadership positions at Penn, including serving as interim dean and deputy dean. In these capacities, Harker oversaw development of the MBA program’s e-commerce major and expanded the school’s distance learning initiatives. He was named the UPS Transportation Professor for the Private Sector in 1991, and served as chairperson of the Operations and Information Management Department from 1997 to 1999. Harker earned both his bachelor’s and master’s degrees in engineering from Penn in 1981. He received a master’s degree in economics and a Ph.D. in civil engineering, also from Penn, in 1983.

More intriguing is the notion of engineers having an aptitude for business. We know it happens. The great firms that are truly revered - like Hewlett- Packard and Intel to name just two - were started, run, and shepherded by engineers. Yet, we pay little attention to the business side of engineering and technology.

That’s why we posed a few questions to Dean Harker, which he so graciously answered for us - and gave some great advice.

Q: Before teaching, you were first trained as an engineer. What attracted you to teaching?
In my junior year, a faculty member offered me the opportunity to act as a lab assistant and to do some teaching. After the first time in the classroom, I was hooked!

Q: You received your doctorate in civil engineering, but you also have a masters degree in economics. Can you tell us how these are complementary? And how they helped you when you were the UPS Transportation Professor for the Private Sector?
My dissertation work involved developing predictive models of traffic flows. Thus, this work encompassed operations research, economics, and fundamentals of transportation systems. Many areas of systems engineering require the mixture of modeling/ mathematical skills along with a deep understanding of economics. Transportation systems, for example, are not just technical systems, but involve humans and their interaction with the technology. Thus, this combination is quite natural. Over the years, I became more interested in economics and I made a natural transition to being the UPS Professor.
Q: When you first became Dean, you said in an interview that you’d like to “take the school to the next level and create a true community of learners where the boundaries between teacher and student start to be broken apart.” How do you see that happening?

We’re moving quite aggressively as a school to focus less on teaching and more on learning. This statement sounds trivial, but is quite profound in its implications. Higher education is set up to teach. Thus, we teach classes 1.5 hours at a time. However, is this the best way to learn? We’re investing in new learning technologies in the Al West Learning Lab at Wharton to explore new methods to help students learn. Also, we’re taking students to Marine Corps officer training, mountain climbing, etc. to help them learn about their leadership skills. This is happening on campus today and will continue, as students become alumni. It’s a real commitment to helping students become active, life-long learners.

Q: With the softening of the economy, has Wharton seen more people applying for entrance? If so, what percentage are engineers or come from a technical background?

Yes, we’ve hit record numbers of applications this year. About a third of the class are engineers and this has been the case for many years. We offer an executive-format MBA in San Francisco (Wharton West), and about one-half of the folks in this program are engineers or computer scientists.

Q: What is the value to an engineer or an engineering student to think in terms of an MBA or matter any business education.

Simply, I think the value is to see the whole picture. Engineers function in a complex system of not just technological innovation, but also monetary flows and human relationships. To effectively lead organization, one needs to see how capital, technology, and people interact. It’s this synthesis of knowledge that we strive for in a business school.

Q: Since this interview is being conducted in the late spring of 2002 - commencement time for many students graduating - do you have any general words of advice for those reading this newsletter who have been recently graduated?

Take risks. There is no better time to follow your dreams. You may not get the perfect job right now, so think for the long-run about where you want your career to go, and make sure that you’re constantly moving toward your goals. Granted that Harker’s position is one-of-a-kind - literally – understanding and working with the business of technology is important for all engineers. Whether as an academic seeking funds from business, as a professional engineer selling services to a business, or as an engineer working for a business, becoming “business savvy” can only enhance any engineer’s career.

---

**Mixin’ Bizness and Engineering**

by Emily Sopensky

One of our longtime ITS Council representatives was just elected as the 2003 VP of Finance.

**William Scherer, Professor of Systems and Information Engineering, University of Virginia** (Charlottesville, VA, USA) just spent the last year on his sabbatical teaching at the world renowned Darden School of Business at the University of Virginia.

Could it be that his sabbatical made him more eligible to replace a Wharton grad who is at her term limit?

Dunno. Let’s hear what Bill has to say about his academic studies.
Q: Before teaching, you were first trained as an engineer. What attracted you to teaching?

WS: Throughout college I enjoyed working with fellow students and helping them understand the material being covered, and as I progressed through graduate school I began to consider teaching at a University as a career. In the years after receiving the PhD I decided that a research university was the best fit for my career goals.

Q: Where and what did you study as an undergrad and graduate student?

WS: I began as an electrical engineer at Rose-Hulman Institute of Technology, but decided that I preferred dealing with large-scale systems and transferred to the University of Virginia (UVa) in the systems engineering department. I became involved with interesting research as an undergraduate, working with Chip White, and continued on through to the PhD with Chip as my advisor. My dissertation involved stochastic control, specifically algorithms for improving the solution speed of Markov Decision Processes (MDPs).

[Note: Chip White is the editor in chief of the IEEE Transactions on Intelligent Transportations Systems.]

Q: What led you to study transportation systems?

WS: My interest is in modeling large-scale complex systems and related systems engineering issues. Transportation systems definitely meet my criteria! A small, but quality transportation research group was active at UVa in those early years. That group has grown to a significant Center for Transportation studies that includes a unique Smart Travel Lab (STL - http://itsm.sys.virginia.edu/). Our activities involve aspects of systems design, such as writing requirement for TMC (traffic management centers), evaluating ITS technologies, developing and implementing forecasting and optimization algorithms, and designing data warehouses.

Q: Have you seen more or fewer engineering students at UVA interested in transportation systems?

WS: Interest in transportation systems has definitely grown, especially as information technology has become a critical component in transportation systems. Our efforts at the STL require very contemporary and interdisciplinary skills, including computer science, systems engineering, electrical engineering, and applied mathematics. As a result, we have students from almost every department in the engineering school involved in transportation systems research. We also involve students at all levels - first year undergraduates as well as doctoral students - in our research projects.

Q: You spent your sabbatical teaching at the UVA Darden School (business admin). Why did you want to teach there? What course(s) did you teach?

WS: I wanted to see the application of quantitative analysis tools from the pure business perspective. While I was there, I taught a first year MBA course on Quantitative Analysis and an advanced elective on Optimization Models with a Darden colleague, Robert Carraway. Given the extensive amounts of data available in most organizations today, analytical decision tools are more critical than ever if the data being stored is going to be transformed into information and eventually business decisions. This vast amount of information, e.g., what is now available in the transportation world, has created an incredible potential for analytical modeling and improved decisions.

Emily Sopensky, the VP of Finance for the ITS Council, received her MBA from the Wharton School. She is looking forward to Dr. Scherer’s participation.
Editor’s note: Andrew L. Drozd made IEEE Fellow this year
by Alberto Broggi

We are proud to announce that one of our long-time Council representatives from the Electromagnetic Compatibility Society recently was named IEEE Fellow. Here’s a bio we found on him at: http://www.ieee.org/organizations/pubs/newsletters/emcs/winter00/board.htm

Andrew L. Drozd is President of and Chief Scientist for ANDRO Consulting Services, which is dedicated to work in the fields of EMC, CEM, and electromagnetic environmental effects (E3). He received a BS in Physics and Mathematics in 1977 and an MSEE specializing in Communications/Signal Processing in 1982, both from Syracuse University. His professional responsibilities include: systems engineering; EMC computer modeling, simulation and analysis; exploitation of innovative, expert system technologies for EMC/CEM analytical applications; and EMC laboratory testing support including the design and conduct of experiments. Mr. Drozd continues to apply his over 23 years of technical and program experience in electromagnetics technologies primarily for the modeling and analysis of E3 effects, environments, and responses for government and commercial systems. Mr. Drozd is a Senior Member of the IEEE and an active EMC Society Member for over 15 years. He has completed his first three-year term as a Member of the EMC Society Board of Directors. He is involved in several important initiatives that cut across membership, technical, standards, and communications services for the Society. He is Vice Chair of the Education Committee and has organized the EMC Experiment Demonstrations for the annual IEEE EMC symposia since 1992. He is a Member of the EMC Society SDCOM and is the EMC Society senior liaison on the newly formed IEEE Intelligent Transportation System Technical Council. Mr. Drozd is the current EMC Chapter Chair for the IEEE Mohawk Valley Section and is a Member of the TC-9 Committee on Computational Electromagnetics. He is a Member of the IEEE Continuing Education Products Committee and has been actively involved in the IEEE sponsored Dual Use/Information Technologies and Applications Conference held annually in Upstate New York where he was responsible for establishing tracks that address EMC concerns in the information age. Mr. Drozd is also a NARTE certified EMC Engineer. He has authored and co-written approximately 100 technical papers, reports, and newsletter/journal articles on various EMC topics. Mr. Drozd continues to support the goals of the EMC Society on behalf of membership development, promoting education, standards development, and webmaster activities.
Non-Council ITS News

CFP: IEEE Intelligent Systems Magazine

by Alberto Broggi

IEEE Intelligent Systems Magazine
Call for Short Papers/Reports

IEEE Intelligent Systems Magazine has started a regular department on Intelligent Transportation Systems. This department (published in each issue) describes current trends and ideas for future systems/realizations/projects in the field of ITS.

People willing to share their ideas and disseminate the results of their projects are invited to prepare a short article (from 2 to 5 magazine pages) describing current trends, projects, research directions, and their experience in any field of Intelligent Transportation Systems.

For further publication guidelines and for suggestions, contact the editor at broggi@ce.unipr.it with a possible outline of the proposed article or browse www.ce.unipr.it/broggi/is-department for a quick look at past installations of this department.

Thanks to an agreement with the Magazine, published articles are reprinted in this Newsletter.

Faculty position in Intelligent Transportation Systems and Telematics

by Will Recker

Dear Colleague:

We are asking your help in identifying candidates for a tenure-track faculty position in Intelligent TRANSPORTATION Systems AND TELEMATICS that we are currently filling here at the University of California, Irvine. Depending upon the candidate’s background and interests, the primary appointment will be either in the Department of Electrical and Computer Engineering or in the Department of Civil and Environmental Engineering, with the possibility of joint appointment in the other department or in the Department of Information and Computer Science. The position requires a Ph.D. degree in any of the allied disciplines of Civil Engineering, Mechanical Engineering, Electrical and/or Computer Engineering, Computer Science.
We would greatly appreciate your bringing the attached position announcement to the attention of any colleagues or completing Ph.D. students who you think might be interested in such a position. Any interested parties can reply directly to me at the address included in the announcement or e-mail me at wwecker@uci.edu. Thanks for your help.

Will Recker, Professor
Department of Civil and Environmental Engineering
Director, Institute of Transportation Studies
522 Social Science Tower
University of California
Irvine, CA 92697-3600, USA

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1/4 color page, specific position:....400 USD
This department is dedicated to catching a glimpse on the WWW trying to discover interesting ITS related Web resources. Reviewed sites range from research programs and projects, to software packages, databases, associations, non-profit companies, and more.

Every suggestion or contribution is welcome and should be addressed to fascal@ce.unipr.it.

- **ERTICO** is an international public/private partnership for Intelligent Transport Systems and Services (ITS) in Europe. It is a non-profit company and its two dominant issues are using ITS to support transport policy and making ITS profitable. This is accomplished through Projects, Fora, Committees and other initiatives as well as through the Regional and World Congresses.
  Link to ERTICO site: [http://www.ertico.com](http://www.ertico.com)

- **ITS Institute of the University of Minnesota** is a University Transportation Center (UTC) whose mission is to advance U.S. technology and expertise in the many disciplines that make up transportation. Their slogan is “To enhance the safety and mobility of road and transit-based transportation through a focus on human-centered technology.”
  Link to the ITS Institute of the University of Minnesota: [http://www.its.umn.edu](http://www.its.umn.edu)

- **The Transport Engineering Laboratory of the Aristotle University of Thessaloniki** is a multidisciplinary research group that focuses on transport related issues. It aims at promoting applied research and new methodologies in the field of transport. They have projects on telematic standards and systems for elderly and disabled travellers, new technologies in maritime transport, testing of actual freight operations. Link to the Transport Engineering Laboratory of the University of Thessaloniki: [http://hermes.civil.auth.gr](http://hermes.civil.auth.gr)

- **The USA National Associations Working Group for ITS**, in partnership with the U.S. Department of Transportation, is composed of national associations of both state and local officials and transportation service providers with a common interest in understanding the concepts, practices and applications of ITS.
  Link to National Associations Working Group for ITS site: [http://www.nawgits.com](http://www.nawgits.com)

- **IVsource.net** is one of the most complete and up-to-date web resources dedicated to promote the field of Intelligent Vehicles and to keep track of developments in this emerging industry. It offers a news service publicizing products, projects and press releases, an updated calendar of IV-related events, a place to post job vacancies, a wide collection of presentations, reports, articles, and much more.
  Link to IVsource.net: [http://www.ivsource.net](http://www.ivsource.net)
Upcoming Conferences, Workshops, or Symposia

by Massimo Bertozzi

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

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<td>Applications Of Advanced Technology In Transportation</td>
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<tr>
<td>IRF &amp; ARF: Asia Pacific Road Conference &amp; Exhibition</td>
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<td>6th International Symposium on Advanced Vehicle Control (AVEC’02)</td>
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<td>Engineering of Intelligent Systems</td>
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<td>IEEE Semiannual Vehicular Technology Conference (VTC-2002 (fall))</td>
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<td>Artificial and Computational Intelligence (ACI 2002)</td>
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<td>Intelligent Systems and Control (ISC 2002)</td>
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<td>Minimizing Driver Distraction Symposium and Workshop</td>
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<td>The 3rd International Workshop on ITS Telecommunication</td>
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<td>Transport System Telematics</td>
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<td>ITS Texas Annual Meeting</td>
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<td>7th International Conference on Control, Automation, Robotics and Vision</td>
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<tr>
<td>AeroSense 2003</td>
<td>Orlando</td>
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<tr>
<td>Demo 2003</td>
<td>San Diego</td>
<td>August 16–20, 2003,</td>
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<tr>
<td>International Task Force on Vehicle-Highway Automation</td>
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CFP: Special Issue of IEEE Robotics and Automation Magazine

by Stefano Stramigioli

IEEE Robotics and Automation Magazine

Special Issue on
Robotic Technologies applied to
Intelligent Transportation Systems

Robotic technologies are vastly used in the field of Intelligent Transportation Systems. Few examples could be found in vision applications like tracking visual servoing or control of linear and nonlinear systems.

The goal of this special issue is to present to the reader the state of the art of those technologies which find an application in the field of Intelligent Transportation Systems.

Traffic supervision, path planning, obstacle avoidance, measurement systems are all example of typical robotic technologies applied to the field of transportation.

Objectives

Give an overview of the applied research works, mainly the ones that reached industry. Authors are invited to submit papers that meet all of the following criteria:

1. Reflect collaboration work being carried out in cooperation between industry and academia, with mutually provided efforts and resources, and that reached prototype phase.
2. Reflect advances in the area of robotics and automation which have been matured for intelligent transportation systems.
3. Describe in detail the problem under study, options available, and reasons to have followed the presented path.
4. Give enough technical details, nevertheless avoiding long system descriptions.

Deadline Submission: 28th of February 2003
Electronic Submission at: http://www.geoplex.utwente.nl/ras
Notification Acceptance: 1st of June 2003
Final Paper Due: 15th of June 2003
Publication is targeted to: September 2003
Criteria for Selection: All papers submitted will have 3 independent reviews.

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CFP: Transport Systems Telematics 2002
by Renata Skowronska

International
Research Conference
Transport Systems
Telematics - 2002

First Call

Katowice - Ustroń
November 7-9, 2002
Poland

Scope & Contributions

Information-processing technologies and telematics play a
crucial role in modern transportation systems of control and
management. The conference organizers invite contributors
who wish to present their original works that fall into one of
the conference themes. The primary goal of the conference is
to promote the information and tele-transmission processes in
modern procedures of transportation information and
management systems. Participating in the conference will bring
a good opportunity to learn about the present techniques and
future directions of information processes in transport.

Authors who wish to participate in the conference should send
two copies of a full paper (8-10 pages) and one electronic copy
on a diskette 3.5" (or send it with the help of e-mail), in MS
Word 7 or above format. The conference materials will be
published on CD (ISBN). The papers’ selection will be held by
two reviewers on scientific, technical quality basis and clarity
of presentation. Registration fee payment and personal
presentation on the conference are required for full papers
publishing. Selected papers will be published in special issue
"Zeszyty Naukowe" of Silesian University of Technology in
series "Transport", which has the high position in KBN-ranking
of scientific periodicals. The instruction of paper preparing
will be automatically sent after registration procedure with
the help of internet form – http://zeus.polsl.gliwice.pl/~tst

Important Dates

- Registration card submission - deadline: 30 July 2002
- The full paper submission - deadline: 30 July 2002
- Notification of the full paper acceptance - deadline:
  30 August 2002
- The conference fee payment - deadline:
  30 September 2002

Secretariat:
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Conference fee

Scientific program of the conference, proceedings, accommodation, full board,
coffee break, regional party
One day participation in scientific program (after organizers agreement),
conference materials, coffee break, conference dinner
Accompanying person
Advertising in conference materials (after organizers agreement)
Cost of the stall in exhibition hall (after organizers agreement)
Cost of product presentation on conference (after organizers agreement)

225 EUR/person
75 EUR/person
75 EUR/person
150 EUR/person
150 EUR/person

Conference Topics

The topics related to Telematics and its application in
transport: papers and posters on following areas are welcome:
- Transport management systems,
- Intelligent Transport Systems (ITS),
- Telematic services for travellers,
- Vehicle equipment in telematic means,
- Introduction strategies of transport telematics solutions,
- Control in transport systems,
- Structure of intelligent transport systems,
- Equipment of tele-transmission and tele-navigation,
- Transport control systems,
- Transport control and management safety,
- Transportation systems simulation,
- Standardization of telematic transport systems,
- Telematic in logistic services,
- European Framework Programs,
- Transport economics and policy