INTELLIGENT TRANSPORTATION SYSTEMS

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IEEE ITS COUNCIL NEWSLETTER

Editor: Prof. Alberto Broggi, broggi@ce.unipr.it

Vol. 3, No. 1, January 2001

In This Issue

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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, or Word, to the Editor at a.broggi@ieee.org *at least 1 month prior to the newsletter's distribution:*

Issue	Due date
January	December 1st
April	March 1st
July	June 1st
October	September 1st

Council News

From the Editor

by Alberto Broggi

Dear ITS-researcher,

as already happened with the last issue, our Newsletter is getting bigger and bigger. This issue includes interesting articles, news from the IEEE ITS Council, and the index (with abstracts) of the papers that will appear on our Transactions on Intelligent Transportation Systems.

I would like to take this opportunity to encourage you to read carefully the intriguing feature articles, and send me your impressions and ideas; the 'Letters to the Editor' section will be devoted to discussions on ITS-related fields.

Thanks again to everyone for helping me completing another very rich issue.

From the elected IEEE ITS Council President

by Daniel J. Dailey

Dear Colleagues,

2000 was a very good year for the ITSC Council. The year 2000 featured BOTH a successful conference that combined the Intelligent Transportation System Conference & the Intelligent Vehicle Symposium, AND the publication of the first four issues of our new Transactions!

The attendance numbers at the conference as well as the quantity and quality of the transactions submission demonstrate the wide audience for ITS activities, and the need for a professional body like the ITS Council to make these things happen. I would like to thank the 2000 conference organizers for their hard work and I would like to thank the officers and council members for their trust in electing me to be the 2001 president.

I believe that 2001 will be an even more exciting year for the ITS Council. Our two conferences will be held on different continents at different times of year. IV 2001 will be in Japan in May and ITSC 2001 in the San Francisco Bay area in August, I encourage you all to plan to attend one or both of these venues at which the world's premier technical papers on ITS will appear. (The call for papers for both events can be found in this issue of the newsletter.) The editor of our Transactions tells me that he has received many fine quality contributions and we may plan to expand the number of pages available in each issue. I encourage you to subscribe to this definitive source for ITS technology and ideas, and I wish you all a successful 2001!

Calendar of Council Events

by Charles J. Herget

Next Meetings are scheduled as follows:

ITS Council Meetings:

February 17, 2001 ..... Albuquerque, New Mexico
August 26, 2001 ..... Oakland, California, during IEEE ITS Conference 2001

ITS Executive Committee Meetings:

February 1, 2001 ..... teleconference
July 7, 2001 ..... teleconference
August 26, 2001 ..... Oakland, California, during IEEE ITS Conference 2001
November 17, 2001 ..... Mexico City, Mexico

ITS Council Committees Meetings:

August 25, 2001 ..... Oakland, California, during IEEE ITS Conference 2001

ITS for Rent

by Kayoko Hara

ITS for Rent

Reprint of the article appeared on
IEEE Intelligent Systems, September-October 2000, p.84–86

The concept of sharing electric vehicles (renting them for one or several hours or a fraction of an hour) has been around for a while. Examples of previous EV trials include the Praxitele in France, City Car in Matini, Switzerland, and various station car projects in the US. (Station cars are EVs that mass-transit riders drive to and from transit stations.) The Daihatsu Motor Company, in conjunction with the Japan Electric Vehicle Association, also carried out a small-scale EV demonstration in Japan some 20 years ago.

In recent years, Japanese corporations and researchers have conducted a succession of demonstrations of shared small EVs. Leading the way was Honda's field trial of its Intelligent Community Vehicle System in 1998 at its Motegi recreational complex, which features a couple of racing circuits. Demonstrations in 1999 included

- trial operation of the Toyota Crayon system of compact electric commuter cars,
- an ITS/EV project that a group affiliated with the Ministry of International Trade and Industry (MITI) organized at Yokohama and Inagi, a Tokyo suburb,
- a commercial EV demonstration in Osaka, and
- a trial of the Nissan Hypermini EV in Ebina, near Tokyo.

More demonstrations are planned for Kyoto and other cities. This recent spate of Japanese EV projects has two major causes. One is the development of compact, next-generation EVs for in-town use powered by high-performance batteries; the other is that several Japanese automakers have announced various systems for sharing these new EVs. In this installment of Intelligent Transportation Systems, I describe the ongoing ITS/EV Yokohama project, which is demonstrating an EV sharing system for business use. The project's goal is to find real customers at the demonstration site and to develop ways to minimize operating costs.

The sharing system

The Yokohama project started in October 1999 with 30 EVs; it added 20 Nissan Hyperminis in January 2000. The Hypermini is a two-seat, 2.6-meter-long, lithium-ion-battery-powered EV recently developed and marketed for inner-city use and sold to the general public (see Figure 1). The Association of Electronic Technology for Automobile Traffic and Driving (JSK) is organizing the overall ITS/EV project, which groups of participating companies are implementing. Concurrent with the Yokohama project, JSK organized another EV-sharing event, demonstrating the use of EVs as a second car in a residential area of Inagi.

The project's EV sharing system has been developed largely by the Nissan Motor Company and NEC. A mobile-communications network links the communications equipment in each EV to the host computer at the operations center. Users must register in advance to use the system. Each user receives a modified keyless entry fob that stores his or her identification information, which it can transmit to an EV.

Users can reserve an EV by telephone or at a Web site. At the reserved time, the user goes to the EV sharing station and presses a button on the fob while standing in front of an EV. The onboard communications system receives a signal carrying the person's ID and relays it to the operations center. The center compares it with the reservation information and transmits sharing permission to the vehicle. The vehicle then flashes its hazard warning lights and unlocks its doors. The user enters the vehicle and starts it with the ignition key, stored in a holder in the glove compartment. Upon returning the vehicle to the sharing station, the user puts the ignition key back in the holder. At that moment, the onboard communications system judges that the vehicle's use is com-pleted and transmits the vehicle's position and other information to the operations center. The center calculates the sharing fee on the basis of the length of use and mileage and sends that information for display on the in-vehicle monitor. (Because no sharing fee is being charged during the demonstration, billing information is not displayed.) After exiting the EV, the user locks the doors with the fob.

It pays to communicate

During EV operation, the onboard navigation system sends longitudinal and latitudinal information obtained from GPS satellites and information on the remaining battery charge to the operations center at set intervals. Because EVs still have a short driving range and virtually no charging ports are in place at present, people worry about running out of battery power en route. So, the EVs in this demonstration have a return advisory function. This feature constantly monitors the remaining battery charge and the distance from the present location to the vehicle return station, and warns drivers before they exceed the returnable range.

The EVs also have a call button that lets users make a voice call to an operator at the operations center. Users can easily obtain operator support in a variety of situations, such as if they do not know how to operate something, the vehicle suffers some trouble, or they are likely to return the vehicle late.

In urban areas, securing sufficient space for EV stations can be especially difficult. Requiring large auxiliary facilities can pose an obstacle to obtaining station sites. However, because these EVs have communications capabilities, no special facilities are required for vehicle rental or return, except for the battery-charging equipment at EV stations.

The system uses a data communications network intended for ordinary cellular phones. Anywhere data communications service is available, one operations center can provide centralized management of the EV sharing system, even in remote regions.

Taking it to the streets (and parking lots)

Yokohama's Minato Mirai 21 area –the demonstration's location– is a former shipyard that is being redeveloped into a commercial center with rows of high-rise buildings. Covering an area of approximately 10,000 square kilometers, MM21 is home to the offices and stores of 800 companies, having a combined workforce of approximately 50,000 people. On weekends and holidays, sightseers throng the area. The cost of owning a vehicle in MM21 is extremely high, with parking places renting for more than $500 a month. Moreover, to ensure ample visitor parking, building managers have restricted the long-term rental of parking places. This has caused insufficient parking for business-use vehicles. Yet 3,000 company cars still operate in this area.

In urban areas such as this, replacing the numerous business vehicles with public transportation is often impractical. Using clean, emission-free EVs that take up less space than conventional vehicles could greatly improve the urban environment. Business vehicles are generally driven relatively short distances within the city, so EVs, even with their limited driving range, could replace conventional cars for many trips.

For participants, the Yokohama project recruited employees working in MM21 who normally use company cars in their work. They drive the EVs while carrying out their duties. A questionnaire survey was conducted among the participants in February and March. The respondents evaluated the overall system favorably, including its concept, convenience, ease of vehicle and equipment operation, and additional functions such as the return advisory. The results also indicated that the need exists for such a system, if the rental fee is lower than the fee for an ordinary rental car or leased vehicle.

A fter being temporarily suspended at the end of March, the demonstration resumed in late May and is scheduled to run through September. During this period, the project will implement measures to reduce operating costs, such as unmanned operation of the operations center at certain business hours.

JSK intends to continue the demonstration with the goal of improving the system to a commercially feasible level by 2002. Among other improvements, the project aims to enhance the in-vehicle equipment's reliability, reduce costs, and develop a billing function.

Dualmode: Transportation's future

by Francis D. Reynolds

Dualmode: Transportation's future

Reprint of the article appeared on
IEEE Intelligent Systems, November-December 2000, p.77–80

In two or three decades, the predominant transportation system in much of the world will likely be dualmode transportation. We will use even more private cars but do it without our current problems by operating them in two distinct modes. We'll drive them in the normal manner on the streets, and they'll travel automatically at high speeds on special guideways with no driver and their motors shut off. These guideways can be of several different types, but all will carry electricity to power the vehicles. Trips of more than several miles will use the guideways rather than the highways. We will travel more safely, more cheaply, more quickly, less stressfully, and with neither gasoline nor pollution.

Automated highway systems also use a manually driven and an automatic mode. However, dualmode systems incorporate most of the intelligence in the guideway network, not the car. Current AHS thinking concentrates on implementing automated lanes for specially equipped cars on existing highways. A dualmode system will cost more, because it will also require special guideways. In return, it will offer more than just the limited advantages of AHS; it will solve or greatly reduce most of our transportation problems and related environmental problems. And some of the things that dualmode transportation will do for society seemingly can't be done in any other acceptable way.

What dualmode offers

A dualmode system will reduce highway traffic to a dribble because most traffic will ride the high-capacity guideways instead. It will also reduce inner-city traffic congestion because a high percentage of cars going to the cities will not enter the downtown streets at all. Users will park these cars in, and retrieve them from, automatic parking facilities integral with the guideway system.

The guideways will carry most types of vehicles now used on streets and highways. The traffic's bulk will be private cars, but transit buses, transcontinental buses, rental cars, taxis, school buses, delivery trucks, cross-county freight traffic, and perhaps personal rapid-transit vehicles will also use the guideways. Most vehicles will run on both the streets and guideways, but crosscountry buses and long-distance freight vehicles will operate only on the guideways– with no drivers. Freight vehicles will be more like cargo containers than trucks.

The guideways will be at a different level from the streets, highways, and rail-roads to minimize the exposure of pedestrians, nonguideway vehicles, and trains to the automatic constant-speed vehicles on the guideways. The guideways will operate nonstop at full speed day and night, just as our highways would if they weren't jammed.

The guideway speed might be 60 mph (100 kph) in and around cities and a constant 200 mph (320 kph) between cities. With synchronous propulsion (see the section "Linear synchronous motors"), the cars might travel one foot (.3 m) apart. Such numbers provide enormous system capacity. Using two-second minimum headways on the highways, as many American state police departments recommend, and assuming an average vehicle length of 15 feet (4.6 m), at 60 mph a single guideway lane will carry the traffic of approximately 12 highway lanes. Between cities at 200 mph, one guideway lane will be the equivalent of 40 highway lanes. Adding more lanes will become a thing of the past.

The dualmode transportation system will also greatly reduce domestic airline traffic. When you include the time to make reservations, the trips to and from airports, parking, cancelled flights, late flights, baggage checking, security checks, and the rest, the 200-mph guideways will be faster than flying for trips up to perhaps 1,000 miles (1,600 kilometers). And guideway travelers will have privacy instead of someone elsess crying baby. They will also have their own cars to use at their destinations instead of airport buses, rental cars, or taxis.

Oversized and heavy freight and cargo will doubtless continue to travel on the highways and railroads. Excessively large and heavy-duty guideways would cost too much, and most freight doesnlt require what would be the energy-wasteful speeds of the intercity dualmode guideways. But moderate-size guideways will provide valuable shipping of time-critical freight such as mail, meat, produce, and consumer products. So, guideway freight should replace a lot of airfreight.

Basic operation

A driver wishing to enter the guideway system will drive into an "entry stop," shut off the motor, and key the number of the desired guideway exit into a keypad on the dashboard. That exit number will tell the navigation computer where to send the car and tell the billing computer how much to charge the customer for that trip.

Meanwhile, electronics in the entry stop will be reading a chip in the car that identifies it and provides other vital statistics. Simultaneously, an automatic system will check the operation of the carys parts that are essential to safe travel on the guideways. If a vehicle fails any of these requirements, it will be automatically denied access to the guideways and must return to the streets.

After these preliminaries, which might take 30 seconds, the system will accelerate the vehicle to guideway speed and merge it with the guideway traffic.

Energy conservation

Most dualmode cars will eventually be battery-electric or fuel-cell-electric for street use. There, they will only need to run at low speeds and for short distances. So, batteries or hydrogen tanks that are now inadequate for highway use will be more than adequate for just street use. In the early transition years, the cars will have internal-combustion engines because they will need to use highways where guideways are not yet available.

The additional electrical power that the guideways require will far exceed our present power gridrs capacity. This additional power wondt come from petroleum or natural gas; they will be largely depleted. However, we still have plenty of coal. Unfortunately, coal is far from "green." But even if we use coal instead of solar energy to push electrons through the guideway-power transmission lines, the overall dualmode system will be close to twice as efficient as automobiles. So, dualmode transportation will burn less fuel and therefore generate less global-warming CO2 than present transportation does.

Maglev's promise

In some proposed dualmode systems, cars ride on top of the guideways; other systems suspend the cars below overhead guideways. In some systems, the cars run directly on the guideways; other systems require interfacing "pallets" between conventional cars and the guideways. Some dualmode advocates propose supporting the vehicles on the guideways with pneumatic tires; others propose steel wheels on steel rails. But many advocates believe that maglev (magnetic levitation) guideways show the most promise.

Maglev trains are quite well developed, especially in Japan and Germany. They are fast, quiet, smooth, and safe. But passenger trains are largely obsolete whether they use wheels on rails or magnetic levitation. So, maglev trains will die in their infancy. But donlt blame maglev per se for its misuse; it will have wonderful advantages for dualmode transportation. Some are obvious: if the cars are floating with motors off, they

won t be wearing out. Nor will the guideways wear, so they wonot develop dangerous faulty rails or potholes.

In the more common types of magnetic levitation, the magnetic field from AC-powered armature coils, in either the guideways or the cars, reacts with opposing field magnets in either a repulsion mode or an attraction mode (which requires a more complex configuration).

Linear electric motors. Maglev systems usually incorporate linear electric motors to propel vehicles. These linear motors are like ordinary AC motors except that they are laid out flat so that the working parts move linearly instead of rotating. In some cases the same magnets and coils can work for both levitation and propulsion. The motoros stator is built into the guideway, and its moving parts are attached to the levitated car. But the armature carrying the AC current can be in either the car or the guideway, with the field magnets in the opposite location.

If the guideways employ linear synchronous motors, all the cars will travel at precisely the same speed at all times, so the spacing between them will never change. Collisions will be virtually impossible. They will be like boxes on a conveyor belt or like plug-in electric clocks that keep exactly the same time because they all run synchronously on the same alternating current. One major advantage of LSM guideways is greatly increased system capacity due to remarkably lower minimum headways. Another is a greatly reduced failure rate due to a simpler system with much fewer parts. The simplification comes from eliminating the proximity sensors and velocity-control systems, which nonsynchronous guideways or an AHS requires.

True LSMs, like their rotary-synchronous-motor cousins, provide no starting torque when using normal AC power. Most synchronous-linear-motor dualmode advocates propose to accelerate the vehicles on ramps supplied with power of increasing frequency. Because the system can tailor that power s variable frequency, it can precisely merge an entering car with the mainline traffic in a minimum-length gap. Likewise, in the exit or deceleration ramps, power will gradually decrease in frequency, synchronizing the vehicles with it.

During descent of steep grades, the LSMs will act as synchronized alternator generators and provide dynamic braking. This will pump electrical energy back into the power grid rather than wasting it as brake heat.

During a power failure, the cars will still hold their spacing while decelerating. Autosynchronization of the LSMs will occur because they will still be electrically coupled through the guideways. Any car that tends to run more slowly than its mates will receive synchronous power generated by them so that it can keep up with them.

Inductive maglev. The HiLoMag dualmode system (http://faculty.washington.edu/jbs/itrans/hilo1.htm) would use conventional magnetic levitation and linear motors plus a less common type of maglev for guidance and switching. This type, sometimes called inductive maglev, requires no electrical input. Permanent magnets in the moving car induce a current and a corresponding magnetic field in fixed, electrically conductive rails in the guideways. This process generates a repulsion force.

For the cars to switch from one guideway to another at full speed (the same as we merge with or exit highways at full speed), the switching would be initiated automatically in the vehicles, not by switching the track configuration, as occurs on railroads. The switching concept, which is basically that which the Morgantown People Mover and some other systems use, requires two normally parallel lateral guide rails on the guideways. At a junction, the guide rails separate; one follows one arm of the "Y," while the other follows the other arm.

Before a vehicle arrives at a junction, a switching command from the guideway computer system would direct a mechanism in the vehicle to cleave to either the left or right guide rail as the vehicles route requires. The guide rails would be conductive and would provide zero-contact guidance and switching by means of laterally oriented inductive maglev. Because inductive maglev requires no electrical power, the system would guide cars safely even during a power failure.

Efficiency. Although the efficiency will vary widely with the details of the system, maglev combined with linear-motor propulsion will provide excellent efficiency compared with pneumatic tires and internal-combustion engines. Contrary to what many people believe, magnetic support alone doesn t require energy any more than a structural column requires energy to support a roof. I have a novelty ballpoint pen that is supported in the air by permanent magnets. It has no battery, and the pen floats as high now as it did

years ago. The magnets in the base are arranged to produce a swale in the composite flux field, providing a virtual nest in which the pen floats stably.

According to Matt Brogdon and his colleagues, "Maglev consumes per trip about one-seventh of the energy used by a Boeing 737-300." Another approach to estimating the relative efficiencies is to compare lift-to-drag ratios. The L/D of jet airliners is 18 to 20. The L/D of the Bechtel maglev system is said to be 100, while that of the Foster Miller maglev system is 170.

Cost. Although Dualmode guideways will cost more initially than AHS lanes, they will use less energy. Dualmode vehicles might cost more or less than AHS vehicles, depending primarily on whether the dualmode system employs pallets. Cars that ride on pallets will cost less than true dualmode cars. But a palleted dualmode guideway system will cost more than a true-dualmode-car system, owing to the cost of the system-owned pallets, to additional computer complexity, and to additional ramp loops needed to automatically route empty pallets to where they are needed. These places will normally be in residential areas during morning rush hours and in business, shopping, and industrial areas during evening rush hours.

How much will a dualmode guideway system cost? Probably an average of 25 million to 50 million dollars per mile of guideway hundreds of billions for the US national system. But the vehicles will not belong to the guideway companies, so they wonot be part of the system cost any more than the cars on our highways are part of the highway systemos cost. The guideway system will be paid for by automatically charging every vehicle that uses it (and essentially all vehicles will use it). A private-enterprise consortium, the government, or a combination of both could finance and operate the system. Because a dualmode system will be universally used as our highways are, it should never require subsidies.

Now's the time to start

We can't simply continue patching our present obsolete transportation systems. The patches are obviously not working – the overall situation keeps getting worse rather than better. More and more, we see that none of the conventional projects and proposals can do much good. Trains and automobiles are over 100 years old; they were 19th-century inventions. In their present forms they are obsolete. The only way to get high capacity and safe high speeds, keep the wonderful advantages of private cars, and solve transportation-related environmental problems is to design and build a universal system with modern technology for 21st-century traffic and lifestyles.

Many people have concluded that dualmode transportation addresses the greatest number of our transportation problems. It combines the best aspects of both private-car transportation and public transportation, yet it reduces or eliminates most of their shortcomings. In particular, when our petroleum reserves are gone, a dualmode system would continue to operate because it does not depend on internal combustion engines.

A leader in a transportation technical society wrote to me, "Dualmode systems are something that we should keep in mind for the future, but it is too early to think about such revolutionary ideas." Does he realize that designing and implementing a dualmode system will take at least two decades? By that time most of our oil will be gone, and its price will be excessive. Global warming will be worse, air pollution will be worse, concrete will have replaced more flora, and the traffic jams will be intolerable.

At last count, 22 different dualmode systems have been independently proposed. About one-fifth of these originated outside the US. A half-dozen or more inventors are now working together and with others on the Internet to refine the details of an optimum dualmode system. Unfortunately, in spite of this extensive research, the general public and most of the technical fraternity are not yet aware of the very promising and urgently needed dualmode technology.

Report on the ITS Council meeting, Oct 1, 2000

by Emily Sopensky

The ITS Council met October 1, 2000, in the Ritz-Carlton, Dearborn MI.

Present: Robert Barrett (Vehicular Technology), Alberto Broggi (Newsletter Editor) Rye Case (Past President), Daniel Dailey (VP Publications), Andrew Drozd Electromagnetic Compatibility), French (Vehicular Technology), Toshio Fukuda (Robotics & Automation), Charles Herget (Control Systems), Hideki Hashimoto (Industrial Electronics), Richard Klafter (VP Finance), Paul Kostek (Aerospace & Electronic Systems), Ichiro Masaki (VP Conferences), Umit Ozguner (President), Lewis Sabounghi (Communications Society), Sopensky (Secretary), John Troxell (Electron Devices), Shoichi Washinio (Industrial Electronics), Chelsea White III (Transactions Editor and Systems, Man and Cybernetics), Yilin Zhao (Robotics and Automation)

President's Report and Actions

President Ozguner thanked all those involved with the Council for the two years of his presidency. In addition, he noted the appearance of the Transactions, the realization of the ITSC2000 and IV2000, the organization of ITSC2001 and IV2001, the plans for ITSC2002 and IV2002, the existence of the newsletter, the webpage, columns in various IEEE magazines, a financial reserve that shows promise, the development of a membership database, discussions with ITS World Congress organizers, and the association of the Council with standards activities.

Motions approved: A Committee on Constituency be established to enhance interaction with individual members of affiliated Societies and to develop a database interacting with different Council activities. A Committee on Education and Student Activities be established to develop educational activities and programs and support Student Members of affiliated Societies and encourage interest in ITS. Three liaison positions were established to provide 'corporate memory' on running specific conferences. These positions are outside the purview of the VP of Meetings and Conferences, but should have no financial impact. Three long-term liaison positions were established to ensure continuity of structure, quality and organization of meetings of interest to the Council. The tenure of each position would be four years to help the Vice President(s) of Meetings and Conferences. One position is for the ITSC conferences; one for the IV symposiums; the third for World Congress meetings.

President Ozguner appointed Stefano Stramigioli as the chair of the Constituency Committee; Ben Coifman, as the chair of the Education & Student Committee; Toshio Fukuda as the ITSC liaison; Ichiro Masaki as the IV liaison. Chip White and Umit Ozguner will prepare a proposal to World Congress.

Presidential appointments to various technical committee chairs are as follows:

- Prof Anna Hauksdottir, Univ. of Iceland to head the Technical Subcommittee on ITS for Air Traffic
- Prof Ryuji Kohno, Yokohama National Univ. To head the Technical Subcommittee on Communication Networks
- Prof Bin Ning, Northern Jiaotong Univ. to head the Technical Subcommittee on ITS for Railroads.
- Prof Robert Fenton, Ohio State Univ. to head Fellowship Nominations.

Publications (Dailey w/ White & Broggi)

Dailey and White report that the Council expects to make page budget this year. Subscription prices are $20 members and $250 non-members. The newsletter is going out quarterly and is being received well. The database is growing.

Conferences (Masaki)

Fukuda reports on the status of ITSC2000: ITSC 200 papers; IV 88 papers; 14 panel discussions. Reporting on the proposals for future conferences, Masaki expects the Singapore proposal for 2002 to be accepted at the November Excom meeting in November with a modified budget.

Elections

President: Dan Dailey (U of Washington) was elected president.

VP Finance, VP Pubs, VP Conferences, Secretary: Results: VP of Meetings and Conferences is Hideki Hoshimoto; VP Finance is Emily Sopensky; VP of Publications is Yilin Zhao; Secretary is Charles Herget.

VT Society

Bob French asks that the Council look into updating the 1994 28-minute video that the VT Society made on ITS. Some 200 copies were made and it is still selling. He reviewed it and has determined that little is out of date with 75% of the footage that could be retained. Patricia Mickus by the Education Activities Board has asked what to do with the video. VTS offers to pay $5000 towards the expenses of updating the video.

Barrett and French will do a market proposal for the next meeting or at the earliest opportunity.

Motion approved: The Council supports and encourages VTS to complete its recommendations at the first opportunity.

CFP: The IEEE 4th International Conference on Intelligent Transportation Systems

by Daniel J. Dailey

Call for Papers

The IEEE 4th International Conference on Intelligent Transportation Systems

Oakland, California, August 25-29, 2001

www.ieee.org/itsc/2001

The IEEE Intelligent Transportation Systems Council (ITSC) is sponsoring a conference on basic research and applications of leading advances in communications, computer, control, and electronics technologies related to Intelligent Transportation Systems (ITS).

Program Topics:

- Sensors (infrastructure & vehicle-based)
- Communications (wide area & vehicle-to-roadside)
- Simulation (continuous, discrete, real-time)
- Human-Computer 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)
- Technology Forecasting & Transfer
- System/Subsystem Electromagnetic Compatibility
- Signal Processing
- Reliability & Quality Assurance
- Imaging & Image Analysis
- Vehicle Control
- Standards
- Traffic Theory in ITS
- Routing & Route Guidance
- Transit Applications
- Air Traffic Control
- Navigation & Guidance System

Proposals for Special Sessions should be forwarded to itsc2001@its.washington.edu. Suggestions for tutorials are invited and should be forwarded to lhowe@its.berkeley.edu.

Paper Submission:

Complete manuscripts in PDF format must be electronically submitted for review no later than January 15, 2001 at the following address:

www.its.washington.edu/itsc2001

Submitted manuscripts must be no longer than six (6) pages in IEEE two-column format, including figures and references. Manuscripts exceeding this length limit may be rejected without review. A LaTeX style file and a Microsoft Word template are available from the IEEE web site:

www.ieee.org/organizations/pubs/authors.html

HOWEVER, submission **MUST** be in PDF format.

In addition to the manuscript, a cover page should be sent that includes: (1) the title of the paper, (2) the name(s) of the author(s), (3) the technical categories, and (4) the name, mailing address, telephone and fax number, and email address of the contact author. Notification of acceptance is scheduled for May 1, 2001.

Important Dates:

- Paper submission deadline January 15, 2001
- Notification of acceptance May 1, 2001
- Camera-ready copy due June 15, 2001

CFP: 2001 IEEE Intelligent Vehicle Symposium

by Masataka Kagesawa

2001 IEEE Intelligent Vehicle Symposium (IV 2001)

May 14, 2001 - May 17, 2001
(May 14: Tutorial, May 15-16: Workshop, May 17: Technical Tour)
National Institute of Informatics, Tokyo, Japan.

The IEEE Intelligent Transportation System Council (ITSC) is sponsoring a professional-level conference on basic research and present and future applications for Intelligent Vehicles and Intelligent Infrastructures. Papers dealing with vehicle-related 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.

TOPICS

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

PAPER SUBMISSION

Prospective authors are requested to send four copies of an extended abstract, by postal mail, no later than **January 1, 2001** to Dr. Tsugawa:

Dr. Sadayuki Tsugawa
Machine Intelligence Division,
Department of Applied Physics and Information Science,
Mechanical Engineering Laboratory,
1-2 Namiki, Tsukuba-shi, Ibaraki-ken 305-8564 Japan
Fax: +81-298-61-7091

Extended abstract must be no longer than one (1) page (A4 or letter size) including figures. The cover page should include (1) the title of the paper, (2) the names of the authors, (3) the name, mailing address, telephone and fax number, and e-mail address of the contact author.

TUTORIAL and DEMO

Tutorial sessions on DEMO 2000 are going to be held on May 14 (Mon). DEMO 2000 is a kind of big experiment on AHS in Japan; it is held November-December 2000. There will be a lot of intelligent sensors, vehicles, communication systems and infrastructures in DEMO 2000, hence its results is expected to include interesting suggestion for Intelligent Transportation Systems.

DEMO 2000 Technical tour is going to be held on May 17 (Thu). Participants to the tour can experience intelligent vehicles of DEMO 2000 after the conference.

DEADLINES

Paper submission (1 page abstract) ..... Jan 1, 2001
Notification of acceptance ..... Feb 20, 2001
Camera-ready copy ..... Apr 1, 2001

Web site: http://www.cvl.iis.u-tokyo.ac.jp/iv2001/

Report on IEEE Trans. on Intelligent Transportation Systems

by Jerri White

Three issues of Vol.1 of the IEEE Transactions on ITS have now been published. Part I of the Special Issue on Air Traffic Control, the fourth and final issue of Vol. 1, is due to be mailed before the end of January.

Our managing editor at IEEE has informed us that we have met our page budget of 240 pages for the year 2000. We received a total of 85 papers for the year 2000. This total includes all papers that were sent directly to the editor of the Transactions and only those additional papers accepted by the guest editors of the special issues.

The first issue of Vol. 2 has already been sent to the publisher. We anticipate that Vol. 2, No. 1 will be mailed on schedule in March. Prof. N. Harris McClamroch has informed us that preparations for Part II of the Special Issue on Air Traffic Control are nearing completion. Publication for that issue is tentatively scheduled for June issue of 2001.

Guest Editor, Prof. Ryuji Kohno has informed us that the Special Issue on ITS Telecommunications is progressing very well and should be ready for publication in either September or December. This special issue will present the best papers, suitably revised and in some cases extended, from the first International workshop on ITS Telecommunications, ITST2000.

We also have several papers recently accepted for a regular issue and anticipate meeting the 240-page budget for the year 2001. According to the original plan, the page budget will gradually increase beginning in 2002.

Proposals have been accepted for three more special issues. Profs. Alberto Broggi and Petros Ioannou will be guest editors of a special issue featuring the best papers of the IV and ITSC 2000 conferences. Prof. Ryuji Kohno will be guest editor of a second special issue on ITS Telecommunications presenting the best papers from the ITS Telecommunications section of IV2001. Prof. Katsu Ikeuchi has proposed a special issue containing the best papers from other sections of IV2001.

In order to increase interest in the Transactions, 50 copies of Vol. 1, No. 1 were distributed at the ITS Council Conference in Dearborn, Michigan, in October 2000. The Transactions Editor, Prof. Chelsea White, distributed 50 copies of Vol. 1, No. 1 at the ITS World Congress in Torino, Italy, in November 2000. Prof. Katsu Ikeuchi has proposed increasing awareness of the Transactions in Japan by distributing copies of Transactions to key industry and government people in Japan. He will distribute copies at IV2001, which will take place in Tokyo in May. Two hundred copies of the Special Issue on Vision Applications and Technology for Intelligent Vehicles, Parts I and II, will be sent to Prof. Ikeuchi for this purpose.

IEEE Trans. on Intelligent Transportation Systems - Index

by Chelsea C. White

Vol.1, No.2, June 2000,
Special Issue on Vision Applications and Technology for Intelligent Vehicles, Part I

- **A Vehicle Occupant Counting System Based on Near-Infrared Phenomenology and Fuzzy Neural Classification,** by I. Pavlidis, V. Morellas, and N. Papanikolopoulos;

  Abstract: We undertook a study to determine if the automatic detection and counting of vehicle occupants is feasible. An automated vehicle occupant counting system would greatly facilitate the operation of freeway lanes reserved for buses, car-pools, and emergency vehicles (HOV lanes). In the present paper we report our findings regarding the appropriate sensor phenomenology and arrangement for the task. We propose a novel system based on fusion of near-infrared imaging signals and we demonstrate its adequacy with theoretical and experimental arguments. We also propose a fuzzy neural network classifier to operate upon the fused near-infrared imagery and perform the occupant detection and counting function. We demonstrate experimentally that the combination of fused near-infrared phenomenology and fuzzy neural classification produces a robust solution to the problem of automatic vehicle occupant counting. We substantiate our argument by providing comparative experimental results for vehicle occupant counters based on visible, single near-infrared, and fused near-infrared bands. Interestingly, our proposed solution can find a more general applicability as the basis for a reliable face detector both indoors and outdoors.

- **Vehicle Type Identification through Automated Virtual Loop Assignment and Block-based Direction Biased Motion Estimation,** by A. H. S. Lai and N. H. C. Yung;

  Abstract: This paper presents a method of automated virtual loop assignment and direction-based motion estimation. The unique features of our approach are that first, a number of loops are automatically assigned to each lane. The merit of doing this is that it accommodates pan-tilt-zoom (PTZ) actions without needing further human interaction. Second, the size of the virtual loops is much smaller for estimation accuracy. This enables the use of standard block-based motion estimation techniques that are well developed for video coding. Third, the number of virtual loops per lane is large. The motion content of each block may be weighted and the collective result offers a more reliable and robust approach in motion estimation. Comparing this with traditional inductive loop detectors (ILDs), there are a number of advantages. First, the size and number of virtual loops may be varied to fine-tune detection accuracy. Second, it may also be varied for an effective utilization of the computing resources. Third, there is no failure rate associated with the virtual loops or physical installation. As the loops are defined on the image sequence, changing the detection configuration or redeploying the loops to other locations on the same image sequence requires only a change of the assignment parameters. Fourth, virtual loops may be reallocated anywhere on the frame, giving flexibility in detecting different parameters. Our simulation results indicate that the proposed method is effective in type classification.

- **An Algorithm to Estimate Mean Traffic Speed Using Un-calibrated Cameras,** by D. J. Dailey, F. W. Cathey and S. Pumrin;

- **Traffic Monitoring and Accident Detection at Intersections,** by S. Kamijo, Y. Matsushita, K. Ikeuchi, and M. Sakauchi;

  Abstract: Among the most important research in ITS is the development of systems that automatically monitor traffic flow at intersections. Rather than being based on global flow analysis as is currently done, these automatic monitoring systems should be based on local analysis of the behavior of each vehicle at the intersection. The systems should be able to identify each vehicle and track its behavior, and to recognize situations or events that are likely to result from a chain of such behavior. The most difficult problem associated with vehicle tracking is the occlusion effect among vehicles. In order to solve this problem we have developed an algorithm, referred to as Spatio-Temporal Markov Random Field, for traffic images at intersections. This algorithm models a tracking problem by determining the state of each pixel in an image and its transit, and how such states transit along both the x-y image axes as well as the time axes. Vehicles, of course, are of various shapes and they move in random fashion, thereby leading to full or partial occlusion at intersections. Despite these complications, our algorithm is sufficiently robust to segment and track occluded vehicles at a high success rate of $93 - 96\%$. This success has led to the development of an extendable robust event recognition system based on the Hidden Markov Model. The system learns various event behavior patterns of each vehicle in the HMM chains and then, using the output from the tracking system, identifies current event chains. The current system can recognize bumping, passing, and jamming. However, by including other event patterns in the training set, the system can be extended to recognize those other events, e.g., illegal u-turns or reckless driving. We have implemented this system, evaluated it using the tracking results, and demonstrated its effectiveness.

- **Image Analysis and Rule-based Reasoning for a Traffic Monitoring System,** by Rita Cucchiara, Massimo Piccardi and Paola Mello;

  Abstract: The paper presents an approach for detecting vehicles in urban traffic scenes by means of rule-based reasoning on visual data. The strength of the approach is its formal separation between the low-level image processing modules (used for extracting visual data under various illumination conditions) and the high-level module, which provides a general-purpose knowledge-based framework for tracking vehicles in the scene. The image processing modules extract visual data from the scene by spatio-temporal analysis during daytime, and by morphological analysis of headlights at night. The high-level module is designed as a forward chaining production rule system, working on symbolic data, i.e. vehicles and their attributes (area, pattern, direction and others) and exploiting a set of heuristic rules tuned to urban traffic conditions. The synergy between the artificial intelligence techniques of the high-level and the low-level image analysis techniques provides the system with flexibility and robustness.

Vol.1, No.3, September 2000,
Special Issue on Vision Applications and Technology for Intelligent Vehicles, Part II

- **Simultaneous Detection of Lane and Pavement Boundaries Using Model-Based Multisensor Fusion,** by Bing Ma, Sridhar Lakshmanan, and Alfred Hero;

  Abstract: This paper treats a problem arising in the design of intelligent vehicles: automated detection of lane and pavement boundaries using forward-looking optical and radar imaging sensors mounted on an automobile. In previous work, lane and pavement boundaries have always been located separately. This separate detection strategy is problematic in situations when either the optical or the radar image is too noisy.

  In this paper, we propose a Bayesian multisensor image fusion method to solve our boundary detection problem. This method makes use of a deformable template model to globally describe the boundaries of interest. The optical and radar imaging processes are described with random field likelihoods. The multisensor fusion boundary detection problem is reformulated as a joint MAP estimation problem. However, the joint MAP estimate is intractable, as it involves the

computation of a notoriously difficult normalization constant, also known as the partition function. Therefore we settle for the so-called empirical MAP estimate, as an approximation to the true MAP estimate. Several experimental results are provided to demonstrate the efficacy of the empirical MAP estimation method in simultaneously detecting lane and pavement boundaries. Fusion of multi-modal images is not only of interest to the intelligent vehicles community, but to others as well, such as biomedicine, remote sensing, target recognition. The method presented in this paper is also applicable to image fusion problems in these other areas.

- **Stereo- and Neural Network-Based Pedestrian Detection,** by Liang Zhao and Charles E. Thorpe;

  Abstract: Pedestrian detection is essential to avoid dangerous traffic situations. In this paper, we present a fast and robust algorithm for detecting pedestrians in a cluttered scene from a pair of moving cameras. This is achieved through stereo-based segmentation and neural network-based reco gnition. The algorithm includes three steps. First, we segment the image into su b-image object candidates using disparities discontinuity. Second, we merge and split the sub-image object candidates into sub-images that satisfy pedestrian si ze and shape constrains. Third, we use intensity gradients of the candidate sub- images as input to a trained neural network for pedestrian recognition. The experiments on a large number of urban street scenes demonstrate that the proposed algorithm 1) can detect pedestrians in various poses, shapes, sizes, clothing, and occlusion status, 2) runs in real-time, and 3) is robust to illumination and background changes.

- **Walking Pedestrian Recognition,** by C. Curio, J. Edelbrunner, T. Kalinke, C. Tzomakas, and W. von Seelen;

  Abstract: In recent years many methods providing the ability to recognize rigid obstacles - sedans and trucks - have been developed. These methods provide the driver with relevant information. They are able to cope reliably with scenarios on motorways. Nevertheless, not much attention has been given to image processing approaches to increase the safety of pedestrians in urban environments. In this paper a method for the detection, tracking, and final recognition of pedestrians crossing the moving oberserver's trajectory is suggested. A combination of data- and model-driven approaches is realized. The initial detection process is based on a fusion of texture analysis, model-based grouping of, most likely, the geometric features of pedestrians, and inverse-perspective mapping (binocular vision). Additionally, motion patterns of limb movements are analyzed to determine initial object hypotheses. The tracking of the quasi-rigid part of the body is performed by different algorithms that have been successfully employed for the tracking of sedans, trucks, motorbikes, and pedestrians. The final classification is obtained by a temporal analysis of the walking process.

- **Visual Perception of Obstacles and Vehicles for Platooning,** by M. Bertozzi, A. Broggi, A. Fascioli, A. Piazzi, and C. G. Lo Bianco;

  Abstract: This paper presents the methods for sensing obstacles and vehicles implemented on the University of Parma experimental vehicle (ARGO). The ARGO project is briefly described along with its main objectives; the prototype vehicle and its functionalities are presented. The perception of the environment is performed through the processing of images acquired from the vehicle. Details about the stereo vision-based detection of generic obstacles are given, along with a measurement of the performance of the method; then a new approach for leading vehicles detection is described, relying on symmetry detection in monocular images. The paper is concluded with a description of the current implementation of the control system, based on a gain scheduled controller, which allows the vehicle to follow the road or other vehicles.

Vol.1, No.4, December 2000,
Special Issue on Automated Air Traffic Control, Part I

- **A Critical Review of Conflict Detection and Resolution Modeling Methods,** by J. K. Kuchar, L. C. Yang

Abstract: A number of methods have been proposed to automate air traffic conflict detection and resolution (CD&R), but there has been little cohesive discussion or comparative evaluation of approaches. This paper presents a survey of 68 recent CD&R modeling methods, several of which are currently in use or under operational evaluation. A framework that articulates the basic functions of CD&R is used to categorize the models. The taxonomy includes: dimensions of state information (vertical, horizontal, or three-dimensional); method of dynamic state propagation (nominal, worst-case, or probabilistic); conflict detection threshold; conflict resolution method (prescribed, optimized, force field, or manual); maneuvering dimensions (speed change, lateral, vertical, or combined maneuvers); and management of multiple aircraft conflicts (pairwise or global). An overview of important considerations for these and other CD&R functions is provided, and the current system design process is critiqued.

- **Benefits of Direct-To Tool in National Airspace System,** by B. Sridhar, G. B. Chatterji and S. R. Grabbe;

Abstract: Recent initiatives in air traffic management both in the United States and in Europe are aimed at providing air traffic controllers automation tools to separate traffic, meet time constraints required for traffic flow and accommodate route preferences of users such as airlines. These efforts are expected to result in removal of restrictions on users preferred routes without compromising safety. Thus, aircraft will be able to fly optimal routes such as great circle and wind-optimal routes. In the existing system, only a limited number of flights on optimal routes are authorized. Widespread use is limited due to lack of automation tools for maintaining air traffic controller's situational awareness and inter-facility coordination required for safe operations. In addition, aircraft which have the basic navigation capability needed for flying from one navigational aid to another along the airways are unable to fly these optimal routes. National Aeronautics and Space Administration! has developed the design for a new automation tool, referred to as the Direct-To tool, which advises the controller on direct time-saving routes for any aircraft irrespective of levels of equipage. In contrast to earlier studies on the potential benefits of direct routes in the National Airspace System (NAS), the objective of this paper is to evaluate the benefits based on a controller tool. The paper describes the benefits of applying this algorithm to the 20 air route traffic control centers within the continental United States. Benefits are measured in terms of the total time savings accrued by flying the direct route. Results are described for three different implementations dependent on the search region bounding each air route traffic control center. The first region exactly encloses the air route traffic control center airspace, the second is the smallest rectangular bounding region while the third is a bigger rectangular bounding region approximately twice as large as! the second region. It is shown that the application of the Direct-To routing algorithm does not significantly alter the number of conflicts and their spatial distribution compared to the case in which the aircraft fly along the airways. The results presented in the paper suggest that the Direct-To routing algorithm can provide significant cost savings to the users without adversely impacting the air traffic management functions.

- **A Probabilistic Approach to Aircraft Conflict Detection,** by M. Prandini, J. Hu, J. Lygeros, S. Sastry;

Abstract: Conflict detection and resolution schemes operating at the mid-range and short range level of the air traffic management process are discussed. Probabilistic models for predicting the aircraft position in the near term and mid-term future are developed. Based on the mid-term prediction model, the maximum instantaneous probability of conflict is proposed as criticality measure for two aircraft encounters. Randomized algorithms are introduced to efficiently estimate this measure of criticality and provide quantitative bounds on the level of approximation introduced. For short-term detection, approximate closed-form analytical expressions for the probability of conflict are obtained, using the short term prediction model. Based on these expressions, an algorithm for decentralized conflict detection and resolution that generalizes potential fields methods for path planning to a probabilistic dynamic environment is proposed. The algorithms are validated using Monte Carlo simulations.

- **Optimal Cooperative Conflict Resolution for Air Traffic Management Systems,** by Antonio Bicchi, Lucia Pallottino;

  Abstract: In this paper, we consider optimal resolution of air traffic conflicts. Aircraft are assumed to cruise within a given altitude layer, and are modeled as a kinematic system with constant velocity and curvature bounds. Aircraft can not get closer to each other than a predefined safety distance. For such system of multiple aircraft, we consider the problem of planning optimal paths among given waypoints. Necessary conditions for optimality of solutions are derived, and used to devise a parameterization of possible trajectories that turns into efficient numerical solutions to the problem. Simulation results for a realistic aircraft conflict scenario are provided. A decentralized implementation of the optimal conflict resolution scheme is introduced that may allow free-flight coordination in a cooperative airspace management scheme. Impact of decentralization on performance and safety is finally discussed with the help of extensive simulations.

Vol.2. No.1, March, 2001

- **Feasibility Analysis of Steering Control as a Driver-Assistance Function in Collision Situations,** by Ching-Yao Chan and Han-Shue Tan.

- **Discrimination of the Road Condition toward Understanding of Vehicle Driving Requirements,** by Muneo Yamada, Koji Ueda, Isao Horiba, and Noboru Sugie.

  Abstract: The detection of vehicle driving environments is necessary to secure transport facilities safe from accidents and to keep the performance smooth. The road condition is one of the most important factors toward detection of vehicle driving environments. Conventional discrimination methods for road conditions involved the use of optical or ultrasonic sensors. However, since these sensors can only provide spot information, detected results do not always reflect the spacious condition. To deal with this problem, a new algorithm that employs image analysis technology for discrimination of the road condition is proposed in this paper. In this algorithm, for discrimination of the road condition, we focused on features related to water and snow on the road, and we extracted these features by image analysis. Features related to water were extracted by the ratio of horizontal polarization image intensity to vertical polarization image intensity for each pixel. Features related to snow were extracted by texture analysis using the co-occurrence matrix. We employ a multivariate analysis to discriminate five kinds of the road conditions: Dry, Wet, Slushy, Icy, and Snowy, on the basis of these features extracted from the road images as well as temperature. Furthermore, we conducted field tests to verify the accuracy of this algorithm and obtained favorable discrimination accuracy rate of 92.3% on the average.

- **The Use of Computer Vision in Monitoring Weaving Sections,** by Osama Masoud, N. P. Papanikolopoulos, and Eil Kwon.

  Abstract: This paper presents algorithms for vision-based monitoring of weaving sections. These algorithms have been developed for the Minnesota Department of Transportation in order to acquire data for several weaving sections in the Twin Cities Area. Unlike commercially available systems, the proposed algorithms can track and count vehicles as they change lanes. Furthermore, they provide the velocity and the direction of each vehicle in the weaving section. Experimental results from various weaving sections with various weather conditions are presented. The proposed methods are based on the establishment of correspondences among blobs and vehicles as the vehicles move through the weaving section. The blob tracking problem is formulated as a bipartite graph optimization problem.

- **Recognizing Vehicle in Infra-red Images Using IMAP Parallel Vision Board,** by M. Kagesawa, S. Ueno, K. Ikeuchi, and H. Kashiwagi.

CFP: IEEE Transactions on Intelligent Transportation Systems

by Chelsea C. 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 or by call 734-764-5723. Please send five (5) copies of your manuscript for possible publication to:

Chelsea C. White, III, Editor
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Non-Council ITS News

Postdoctoral or PhD Position available at K.U.Leuven

by Tom Bellemans

Postdoctoral or PhD Position available at K.U.Leuven Dept. of Electrical Eng. (ESAT), SISTA/COSIC

There is an opening for a post-doctoral or PhD researcher in the European TMR project ALAPEDES (THE ALGEBRAIC APPROACH TO PERFORMANCE EVALUATION OF DISCRETE EVENT SYSTEMS) in our research group SISTA/COSIC.

See http://www.cs.rug.nl/ rein/alapedes/ for more information about the project or http://www.esat.kuleuven.ac.be/sista for more information about the research group.

As an extension to the original proposal, the subject of research can be 'Traffic modelling'. SISTA/COSIC is also involved in another project on traffic research: 'Traffic Congestion Problems in Belgium: Mathematical Models, Analysis, Simulation and Control' (SSTC MD01/24).

SISTA/COSIC is currently doing research on identification of traffic flow patterns and on control of traffic flows on highways. A fundamental requirement for traffic research is knowledge of the information on turning movements and total number of vehicles through an intersection. The problem is then, based upon traffic flow measurements, to identify the entries of the origin- destination (O-D) matrix, i.e., the probabilities of vehicles entering one leg of an intersection and exiting another in an intersection. This O-D matrix is time dependent and so we are working on fast estimation algorithms to make on line estimation feasible. A second important research topic in the traffic field is the model based development of control schemes for Advanced Traffic Management Systems on highways, such as: ramp metering, variable message signs, dynamic route information panels... Please note that in order to apply, you need to come from an EC (or associated) country (excluding Belgium) and younger than 35 years.

For more information, you can contact:

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CFP: IEEE International Vehicle Electronics Conference (IVEC'2001)

by Shoichi Washino

Preliminary CALL FOR PAPER

IEEE INTERNATIONAL VEHICLE ELECTRONICS CONFERENCE (IVEC'2001)

25-28 September 2001, Tottori, Japan

Sponsor: IEEE Industrial Electronics Society

Cosponsors: Society of Automotive Engineers of Japan
Society of Instrument & Control Engineers

Technical Cosponsors: Society of Automotive Engineers International
Society of Automotive Engineers of China
IEEJ, IPS, IEICE, ASME, RSJ,
Vehicle, Road and Traffic Intelligence Society
IEEE ITSC, Tottori Univ.

CONFERENCE THEME: Vehicle Electronics & Environment; We discuss and think impacts and influence of vehicle electronics and their important roles on environment.

SPECIFIC THEME: - Power electronics in vehicles -Vehicle control
- Modeling and simulation - Sensors & Actuators
- Data Collection and Processing - Design & manufacturing
- Intelligent Transportation Systems (ITS)
- Vehicle information Systems - Recycling
- Vehicle communication Systems - Electric Vehicle
- Pollution Reduction in road traffic Hybrid Electric Vehicle
- Low Emission Vehicle - Others

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Publicity Committee
Mr. Shunichi Fukuyama, Japan, Prof. Hideaki Noda, Japan

Publication Committee
Prof. Masayoshi Aoki, Japan, Prof. Masaaki Shibata, Japan

PLENARY SPEAKERS: Distinguished specialist will be invited.

WORKING LANGUAGE: English

CONFERENCE SITE: Tottori University of Environmental Studies (Approving process is progressing)

AUTHORS SCHEDULE:
Deadline for submission of extended summaries(1000 words): **February 19, 2001**
Notification acceptance and mailing authors' kits: **April 9, 2001**
Deadline for submission of final manuscript: **June 18, 2001**

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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.

Thanks to an agreement with the Magazine, published articles are reprinted in this Newsletter and are made available on the web at: www.ce.unipr.it/broggi/is-department

CFP: Vision in Vehicles 9

by Alastair Gale

VISION IN VEHICLES 9

Brisbane, Australia

19-22 August 2001

The ninth international conference on Vision In Vehicles will be held in Australia in 2001. It is a multi-disciplinary and international forum for the exchange of information on current research encompassing all aspects of vision and its relationship to vehicle and transportation design. Conference proceedings will be published.

Scope: All types of vehicles: cars, motorcycles, cycles, trucks, trains, aircraft, helicopters, ships, autonomous and military vehicles.

Professional interest: Vehicle manufacturers, instrumentation designers, traffic and applied psychologists, ergonomists, ophthalmologists, optometrists, highway engineers, traffic planners, lighting engineers, legislators and anyone concerned with safety in vehicles and transportation.

Topics will include:

- Functional requirements of the driving task
- Road transport informatics: driver-support & navigation systems, HUD
- Vehicle design: vehicle glazing
- External environment: traffic signs, road lighting, fog, rain, night driving
- Visual scanning: UFOV, conspicuity, peripheral & restricted vision
- Simulation: simulators, virtual reality, immersive systems
- Driver's vision: standards, defects, age, night myopia
- Attention, cognitive & perceptual performance: fatigue, multiple tasks
- Speed and distance perception, optical flow, TTC
- Drivers: novice, driver training, experts, older drivers, steering skill
- Human factors & accidents

Individual papers are invited for oral or poster presentation. Abstracts (300 words max.) should be submitted to the address below by **MONDAY 22nd JANUARY 2001**. Submission by email preferred, or by fax / post.

Further information is available on the conference website: http://ibs.derby.ac.uk/viv9

Alernatively for further information or to be added to our mailing list:

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Book Review: "Computerised Vehicle Routing and Scheduling in Road Transport"

by Peter Eibl

Computerised Vehicle Routing and Scheduling in Road Transport

Book Description: This book is aimed at both academics and practitioners interested in the user or management aspects of computerised vehicle routing and scheduling (CVRS) in road transport. The software is investigated with respect to its use in an operational, tactical and strategic role. The empirical findings highlight the fact that CVRS technology is used only by a relatively small number of organizations despite being an effective means to improve the efficiency of transport operations and to provide substantial intangible benefits such as improved control and enhanced customer service. What are the reasons for this apparent "user-gap" between the available CVRS technology and the organizations that most need it? How can the technology be successfully implemented? The research tools employed to find the answers to these questions are both quantitative and qualitative. Their combined use, known as the "triangulation of measurement" approach, is of interest to social science students generally. Contents: Introduction; Basics of VRS; Success of CVRS; Adoption of CVRS; CVRS models in the organizational context; Factors associated with the adoption of CVRS; Factors associated with the success of CVRS; Critical evaluation of the CVRS models and opportunities for their further development. – Peter Eibl, University of Glamorgan, UK.

Referees

"Now that the 'information age' is upon us, our focus of attention is shifting from technology to applications. Peter Eibl's book represents a valuable contribution to this transition, concentrating as he does on the benefits of using information systems and the associated management issues of assessment and implementation." – Professor James Cooper, Director of the Cranfield Centre for Logistics and Transportation, Cranfield University, UK

"It is a well researched and thoughtful book which fills a gap in transportation and information technology literature. While most of the previous research was preoccupied with computational aspects of computerised vehicle routing and scheduling, this book provides an excellent and original analysis of the technology's adoption, practical benefits and implementation. It is well grounded in existing literature, but special strengths derive from the author's meticulous methodology including both qualitative (case study) and quantitative research (survey) instruments. With just the right balance between theory and empirical data, this book will be of interest not only to academics, but also to companies as well as to professional associations and institutes. Students will find this book to be a valuable source for management issues of information technology in general." – Professor Derek H. Smith, Reader and Deputy Head of Department of Mathematics and Computing, University of Glamorgan, UK

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