

Conference Program



The IEEE 4th International Conference on Intelligent Transportation Systems

Oakland, California

August 25-29, 2001

www.ieee.org/itsc/2001/



Table of Contents

Hotel Maps	3
Welcome to IEEE ITSC 2001	4
Note from IEE ITSC President	5
Plenary I Speakers	6
Plenary II Speaker	8
Monday, August 27, 1:30 – 3:00 p.m.	9
Monday, August 27, 3:30 – 5:00 p.m.	11
Monday, August 27, 6:30 - 8:00 p.m.	13
Tuesday, August 28, 8:30 – 10:00 a.m.	14
Tuesday, August 28, 10:30 a.m. – 12:00 p.m.	16
Tuesday, August 28, 1:30 – 3:00 p.m.	18
Tuesday, August 28, 3:30 – 5:00 p.m.	20
Wednesday, August 29, 8:30 – 10:00 a.m.	22
Wednesday, August 29, 10:30 a.m. – 12:00 p.m.	24
Wednesday, August 29, 1:30 – 3:00 p.m.	26
Wednesday, August 29, 3:30 – 5:00 p.m.	28
Tutorial 1, Sunday, August 26, 9 a.m. – Noon	30
Tutorial 2, Sunday, August 26, 9 a.m. – 4 p.m.	31
Tutorial 3, Sunday, August 26, 9 a.m. – 4 p.m.	32
Author Index	33
Organizing Committee	39
Program at a Glance	back cover

Special Events

The welcoming reception will be held Sunday, August 26 at 6:30 p.m. in the Topper Room.

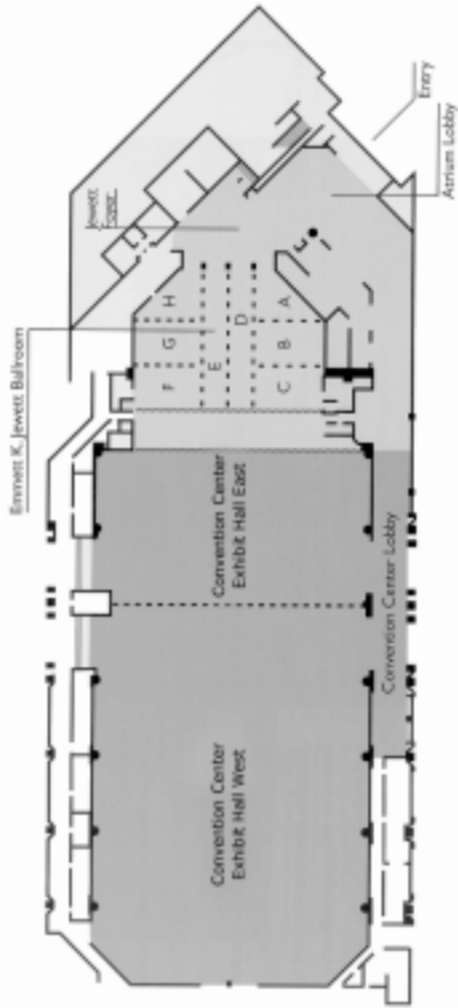
The opening Plenary session will be held in the Jewett Ballroom on Monday, August 27 from 8:30 a.m. until 12 p.m.

The conference banquet will be on Tuesday, August 28 starting at 6:30 p.m. in the Jewett Ballroom.

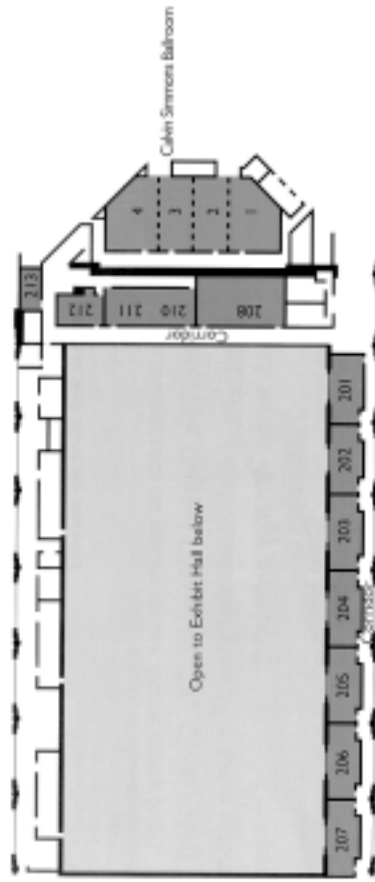
The second Plenary session and luncheon will be held on Wednesday, August 29 at 12 p.m. in the Jewett Ballroom.

If you have signed up for one of the technical tours on Thursday, August 30, please check with the registration desk for details.

Ground Floor:
Jewett Ballroom/Exhibit Hall



Second Floor:
Simmons Ballroom/Meeting Rooms





Welcome To IEEE ITSC 2001

Dear Colleagues,

On behalf of the organizing Committee, I welcome you to the 4th International IEEE Conference on Intelligent Transportation Systems (ITSC 2001), August 25-29, 2001. Since

ITS = IT (Information Technology) + (TS (Transportation Systems),

it is particularly appropriate that ITSC 2001 is being held at the Marriott Hotel, Oakland, in the San Francisco Bay Area. The Bay Area is the birthplace of the IT revolution, and that revolution imposes major burdens on the region's transportation system, which we are attempting to meet in innovative ways.

The technical program is exciting. Professionals and researchers from transportation, automotive technology, and information technology will present 200+ papers in 63 sessions and seven special panels, during August 27-29. There will be three tutorials on Sunday, August 26. Leaders in ITS will initiate the conference plenary session on Monday.

A reception is planned for 6:30 p.m. on Sunday, August 26, a dinner banquet at the Marriot on Tuesday, August 28, and a lunch on Wednesday, August 29. We are arranging three technical tours on Thursday, August 30 at the BART control center, the Caltrans Bay Area Traffic Management Center, and the California PATH's advanced vehicle control and safety program.

The Marriott hotel is located in Oakland's Chinatown, a few blocks from colorful Jack London Square. From a BART station one block away, a 20-minute train ride will take you to downtown San Francisco.

I am glad that you have joined us in making the conference a great success.

Pravin Varaiya
General Chair, ITSC'01

Note from IEEE ITSC President



It gives me great pleasure to have the opportunity to make some comments in the front pages of the program for ITSC 2001. The last time I prepared such material was as Program Chair for VNIS 1995, a precursor conference to ITSC. This year I am again a Program Chair, as well as having the good fortune to be the President of the ITS Council. From this vantage point the changes in the council and the conferences have been dramatic. I'd like to make a few observations about the success of the IEEE ITS activity.

This year the council's two flagship conferences are being held on different continents at different times of year.

The IEEE Intelligent Vehicles Symposium (IV'01) was held in Tokyo, Japan in May. IV'01 brought together vehicle researchers from academia and industry for a very successful symposium. High quality technical presentations on a range of issues that effect the future of vehicular travel were the focal point.

The 4th International IEEE Conference on Intelligent Transportation Systems, ITSC'01, is being held in Oakland, California, USA. ITSC'01 is a truly international event; the countries represented here include: Austria, Canada, Czech Republic, Egypt, Finland, France, Germany, Greece, Hong Kong SAR, India, Israel, Italy, Japan, Korea, Mexico, Morocco, Netherlands, P.R. China, Poland, Portugal, Singapore, Spain, Sweden, Taiwan R.O.C., USA, United Kingdom, Ukraine, and Uruguay. The attendance numbers at the conference, as well as the quantity and quality of the submissions, demonstrate the wide audience for ITS activities.

The editor of our Transactions tells me that he has received so many quality contributions that we plan to expand the number of pages available in each issue. I encourage you to subscribe to this definitive source for peer-reviewed ITS technology and ideas.

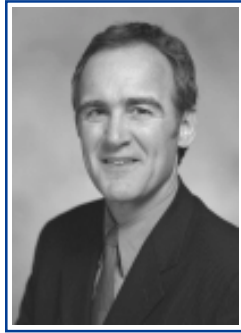
The editor of our newsletter has created an international electronic forum that reaches over ten thousand people! Again, I encourage you to take advantage of this wonderful source for cutting edge ITS information.

In 1995 I could not have imagined that the Council and the Conferences would be so successful. This success is due to the contributions of the volunteers from the IEEE ITS community. I would like to thank the 2001 conference organizers for their hard work. I would also like to thank the officers and council members for their support, and I would encourage those reading this that are not yet active to come join this successful group!

Please join me in enjoying the program for this year's ITSC 2001, the premier technical conference on ITS.

Daniel J. Dailey
ITSC President & ITSC'01 Program Chair

Plenary I Speakers



Lawrence D. Burns – Vice President,
GM Research & Development and
Planning, General Motors Corporation

Larry Burns was named General Motors Vice President in charge of Research and Development and Planning in May, 1998.

In this post, he oversees the Corporation's global R&D programs and has responsibility for its product portfolio, capacity, technology, process, and business plans. He also is a member of the Automotive Strategy Board, GM Automotive's highest-level management team.

Burns first joined General Motors in 1969 as a college student in training. He began his career as a member of the research staff and subsequently held a number of leadership assignments at various GM units, where he directed activities in areas ranging from product operations and business planning to product program management, industrial engineering, production control, and quality. Burns has twice been the recipient of the GM Chairman's Honors Award, the Corporation's highest employee recognition. He also has received three Charles L. McCuen Achievement Awards, presented to members of the R&D staff for extraordinary technical accomplishment.

Burns has a bachelor's degree in mechanical engineering from General Motors Institute (now Kettering University). He holds a master's in engineering/public policy from the University of Michigan and a Ph.D. in civil engineering from the University of California at Berkeley. Burns has authored one book, *Transportation, Temporal, and Spatial Components of Accessibility*, and numerous technical articles. He recently received Kettering University's 2000 Engineering Alumni Achievement Award.

Burns currently is a member of the Operating Council of the United States Council for Automotive Research, the board of directors of the Intelligent Transportation Society of America, and the University of Michigan School of Engineering National Advisory Council. He also serves on the board of the Deafness Research Foundation and the board of directors of the University of Michigan Center for Communication Disorders.

Ann Flemer – Deputy Director,
Metropolitan Transportation
Commission



Ann Flemer became MTC's deputy director for operations in January 2001. She oversees the agency's Transit Coordination and Allocations Section and the Bridge and Highway Operations Section, as well as internal administration and information technology services for MTC, which is the metropolitan planning organization for the nine-county San Francisco Bay Area..

Key transit projects under Flemer's direction include the TransLink® universal transit ticket which will go into testing in the fall of 2001, the Take Transit regional online transit trip planning system, the region's rideshare program, the coordination of accessible transit and paratransit services, and transportation planning related to welfare reform. In the highway realm, she oversees the Freeway Service Patrol tow truck service and the region's network of roadside call boxes, as well as a \$1.5 billion program to upgrade five of the region's state-owned toll bridges.

Ann has worked in public transportation planning, policy and finance at MTC since 1982. She served as the coordinator for the MTC-sponsored Regional Transit Association from 1983 to 1986, managing interagency programs to improve transit accessibility, marketing, employee development, and fare and schedule coordination.

From 1986 to 1991, Ann was responsible for the region's transportation program for elderly persons and persons with disabilities, including the adoption and implementation of the Regional Paratransit Plan and coordinating the transit operators' implementation of the Americans with Disabilities Act.

Ann received her bachelor's degree in Urban Studies from UCLA and her master's degree in City and Regional Planning from UC Berkeley.



**Carl Guardino – President and CEO,
Silicon Valley Manufacturing Group**

Carl Guardino, 39, is President and CEO of the Silicon Valley Manufacturing Group. Founded in 1978 by David Packard of Hewlett-Packard, the Manufacturing Group (SVMG) is a public policy trade association that represents 190 of Silicon Valley's most respected private sector employers, who collectively provide more than 275,000 jobs - nearly one out of every four - in Silicon Valley.

Before being named President of the Manufacturing Group, Guardino worked for Hewlett-Packard Company. Prior to his tenure at Hewlett-Packard, Guardino spent five years at the Manufacturing Group, where he served as Vice President.

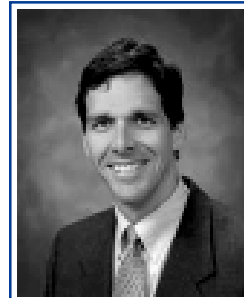
Previously, Guardino spent six years on the staff of Assemblyman Rusty Areias, the last three years as his Chief Assistant. When he was named to that position, he became the youngest Chief Assistant in the State of California.

Guardino was recently named as one of the "Ten Most Powerful" people in Silicon Valley by the San Jose Mercury News "power study," which is only conducted every ten years.

Known throughout the region as a consensus builder, Guardino's work includes managing two successful traffic relief initiatives, known as Measures A and B in 1996; co-directing the November 2000 Measure A traffic relief initiative to bring BART to Santa Clara County; creating the Housing Action Coalition to advocate for housing that is relatively affordable for Silicon Valley workers; developing the Santa Clara County Housing Trust; and forming the Vehicle Buy-Back Coalition to permanently remove older, smoky vehicles from our roads in order to improve air quality.

**Jeff Morales – Director, California
Department of Transportation**

In May 2000, Gov. Gray Davis appointed Jeff Morales as Director of the California Department of Transportation (Caltrans), where he manages a \$10 billion budget and more than 23,000 employees working to build, maintain and operate the largest state transportation system in the country.



Director Morales formally began his duties on June 1, 2000, after serving as Executive Vice President for Management and Performance at the Chicago Transit Authority (CTA).

As head of Caltrans, Director Morales' highest priority is to deliver Gov. Davis' far-reaching plan to cut traffic congestion in the state. He is charged with finding new ways to improve the pace and efficiency of the Department's project delivery process.

The 2000/01 California State Budget commits \$6.8 billion in new transportation funds, including \$5.3 billion for Gov. Davis' Transportation Congestion Relief Plan. Over the next five years, the plan will fund 141 locally recommended projects, the largest General Fund commitment to transportation in state history.

Director Morales has a wide range of experience in transportation and government. At the CTA, he spearheaded major reforms to improve service and increase ridership at the nation's second largest transit agency. Those efforts were instrumental in reversing the steady decline in ridership that had prevailed for the previous 15 years.

Prior to his tenure at the CTA, he was a senior staff member with Vice President Al Gore's National Performance Review, the task force to reinvent the federal government. It has saved taxpayers more than \$130 billion and produced dramatic improvements in the management of federal programs.

He secured unprecedented reforms within the Federal Aviation Administration's personnel and procurement systems. In 1996/97, he was issues director of the White House Commission on Aviation Safety and Security, which laid out a blueprint for a national aviation policy in the 21st century. Morales held senior positions at the U.S. Department of Transportation and was on the staff of the U.S. Senate, where he was a principal drafter of the landmark Intermodal Surface Transportation Efficiency Act of 1991.

Plenary II Speaker

Jeffrey A. Lindley – Director,
Office of Travel Management,
FHWA

On January 2, 2000, Jeffrey A. Lindley became Director of the Office of Travel Management. He directs a staff responsible for FHWA policies and programs related to transportation management and deployment of Intelligent Transportation Systems (ITS). Prior to this appointment, he served as FHWA California Division Administrator from September 1997.

He joined the Federal Highway Administration in 1985 as a Highway Research Engineer in McLean, Virginia. He later held positions as a traffic management /ITS specialist in San Francisco, California and as a Branch Chief and Team Leader in the Office of Traffic Management and ITS Applications in Washington, D.C. In 1996, he was named Deputy Director of the ITS Joint Program Office, and managed a variety of ITS program activities, including development of FHWA's proposal for reauthorization of the ITS program as part of TEA-21.

Prior to joining FHWA, he held transportation engineering positions in the private sector and with the U.S. Air Force.

Jeffrey Lindley is a civil engineering graduate of Virginia Tech and received his Master's Degree in Transportation Engineering from the University of Maryland. He is a registered professional engineer in Virginia, a member and past Chair of the Transportation Research Board's Committee on Freeway Operations, and currently serves as the Chair of the ITS Council of the Institute of Transportation Engineers (ITE).

He has received numerous performance and honor awards, including the Administrator's Award for Superior Achievement, the Fred Burggraf Outstanding Paper Award from the Transportation Research Board, and the Young Engineer of the Year Award from the Washington, D.C., Section of ITE.



Session 1 – Simmons 1

Location-Based Wireless Technologies

Session Organizers: C. Drane and J.L. Ygnace

System Design and Analysis of Repeating GPS

Y. Chen and H. Kobayashi

Computing Travel Times Estimates from GSM Signaling Messages: the STRIP Project

J-G Remy

The Use of Mobile Phones in Traffic Management and Control

V. Astarita, M. Florian

Cellular Telecommunication and Transportation Convergence: A Case Study of a Research Conducted in California and in France on Cellular Positioning Techniques and Transportation Issues

C. Drane and J. Ygnace

Session 11 – Simmons 2

Advanced Traveler Information Systems

Session Organizer: Srinivas Peeta

Development of a Map Matching Method Using the Multiple Hypothesis Technique

J. Pyo, D. Shin, and T. Sung

AI-Base Route Guidance Strategy and Its Simulation

G. He and S. Ma

A New Approach to Map-Matching for In-Vehicle Navigation Systems: The Rotational Variation Metric

R.R. Joshi

Insights on a Stable Route Guidance Model for Real-Time Deployment

S. Peeta and T. Yang

Session 21 – Simmons 3

Urban Traffic Control in Europe

Session Organizer: Chistiane Bielefeldt

A Combined Adaptive/Fuzzy Network Control and Its Application within the Munich Open System Architecture

J. Mertz, F. Weichenmeier, and T. Schon

The Use of SCOOT Outputs at ROMANSE in Southampton

R. Morris and T. Cherrett

TUC and the SMART NETS Project

C. Bielefeldt, C. Diakaki, and M. Papageorgiou

MOTION for SITRAFFIC – A Modern Approach to Urban Traffic Control

F. Busch and G. Kruse

Session 31 – Simmons 4

Control of Automated Vehicles

Session Organizers: Perry Li and D.H.A. Swaroop

A Review of Constant Time Headway Policy for Automatic Vehicle Following

D. Swaroop and K.R. Rajagopal

Assessing the Benefits of Coordination in Automatically Controlled Vehicles

W. Choi and D. Swaroop

Highway Simulation with Velocity Dependent Activities

L. Alvarez, G. Ilagorre, and G. Gomes

Integrated Meso-Microscale Traffic Simulation of Hierarchical AHS Control Architectures

L. Munoz, G. Gomes, J. Yi, C. Toy, R. Horowitz, and L. Alvarez

Session 41 – OCC 208

Adaptive Ramp-Metering

Session Organizer: Michael Zhang

Tracing and Forecasting of Congested Patterns for Highway Traffic Management

B.S. Kerner

A Neuro-Fuzzy Algorithm for Coordinated, Traffic-Responsive Ramp Metering

K. Bogenberger, H. Keller, and S. Vukanovic

An Optimization Algorithm for Freeway Traffic Control

H.M. Zhang, R. Jayakrishnan, and W.W. Recker

ALINEA: A Local Traffic Responsive Strategy for Ramp Metering: Field Results on A6 Motorway in Paris

H. Haj-Salem, P. Poirier, J. Heylliar, and J. Peynaud

Session 51 – OCC 210/211

Traffic Flow Models

Session Organizer: Michael Florian

Improving Hierarchical Route Computations for Roadway Networks

K.H. Quek and T. Srikanthan

A Hybrid Optimization-Mesoscopic Simulation Dynamic Traffic Assignment Model

M. Florian, M. Mahut, and N. Tremblay

A Multi-Lane Link Model of Traffic Dynamics Based on the Space-Time Queue

M. Mahut

Three Approaches to the Dynamic Network Loading Problem

K. Er-Rafia, M. Florian, M. Mahut, and S. Velan

Session 2 – Simmons 1

Sensors

Session Organizer: Ben Coifman

Real-Time Travel Time Estimation Using Macroscopic Traffic Flow Models

P. Kachroo, K. Ozbay, and A.G. Hobeika

Vehicle Reidentification and Travel Time Measurement, Part I: Congested Freeways

B. Coifman and M. Cassidy

Vehicle Reidentification and Travel Time Measurement, Part II: Freeways and the Onset of Congestion

B. Coifman

A Gaussian Maximum Likelihood Formulation for Short-Term Forecasting of Traffic Flow

W. Lin

Development and Field Test of a Laser-Based Non-Intrusive Detection System for Identification of Vehicles on the Highway

H.H. Cheng, B.D. Shaw, J. Palen, B. Link,
J. Parks, and B. Chen

Session 12 – Simmons 2

Navigation

Analysis of Positioning Errors in Radionavigation Systems

D.H. Shin and T.K. Sung

Real-Time Vehicle Location with Desired Accuracy

S.V. Bana and P. Varaiya

Road Grade and Vehicle Parameter Estimation for Longitudinal Control Using GPS

H.S. Bae, J. Ryu, and C. Gerdes

DGPS/INS Integrated Positioning for Control of Automated Vehicle

K.A. Redmill, T. Kitajima, and U. Ozguner

Session 22 – Simmons 3

Traffic Adaptive Signal Control

Session Organizer: Nathan Gartner

Applications of Linear Systems Controller to a Cycle-Based Traffic Signal Control

W. Wey

A Cooperativ Fuzzy Control Method for Traffic Lights

H. Wei, W. Yong, M. Xuanqin, and W. Yan

An Enhanced 0-1 Mixed Integer LP Formulation for the Traffic Signal Problem

W. Lin

Session 32 – Simmons 4

Vision

Vehicle Type Classification from Visual-Based Dimension Estimation

A.H.S. Lai, G.S.K. Fung, and N.H.C. Yung

A Cooperative Approach to Vision-Based Vehicle Detection

A. Bensrhair, M. Bertozzi, A. Broggi, P. Miche,
S. Mousset, and G. Toulminet

An Intelligent Framework for Spatio-Temporal Vehicle Tracking

S. Chen, M. Shyu, and C. Zhang

Session 42 – OCC 208

Data Fusion Techniques

Session Organizer: Reinhart D. Kuhne

An Adaptive Model for Real-Time Estimation of Overflow Queues on Congested Arterials

L. Fu, B. Hellinga, and Y. Zhu

A Simple and Effective Method for Predicting Travel Times on Freeways

J. Rice and E. van Zwet

New Filtering Methods for Data Fusion and Short Term Forecast for Urban Traffic

B. Kummerer and R.D. Kuhne

Prediction of Congestion Due Road Works on Freeways

A. Ober-Sundermeier and H. Zackor

Session 52 – OCC210/211

OR Methods in Transportation

Session Organizer: Georgia Perakis

Characterizing Braess's Paradox for Traffic Networks

J.N. Hagstrom and R.A. Abrams

Second-Order Fluid Dynamics Models for Travel Times in Dynamic Transportation Networks

S. Kachani and G. Perakis

Computation Methods for Congestion Toll Pricing Models

D.W. Hearn, M.B. Yildirim, M.V. Ramana,
and L.H. Bai

A Numerical Analytical Model for the Continuous Dynamic Network Equilibrium Problem with Limited Capacity and Spill Back

J.M. Rubio-Ardanaz, J.H. Wu, and M. Florian

Session 61 – Simmons 1

Special Panel 7: Air- and Space-Based Remote Sensing of Traffic Flows

Session Organizer: Mark Hickman

Mark Hickman, Assistant Professor, University of Arizona
The National Consortium on Remote Sensing of Transportation Flows

Dinesh Chandnani, Graduate Researcher, and Pitu Mirchandani, Professor, University of Arizona
Image Processing for Real-Time Estimation of Traffic Flow Variables

Rabi Mishalani, Assistant Professor, and Benjamin Coifman, Assistant Professor, The Ohio State University
Evaluating the Use of Airborne-Based Sensor Data in Real-Time Origin-Destination Flow Estimation

Alejandro Angel, Graduate Researcher, and Mark Hickman, Assistant Professor, University of Arizona
Estimation of Traffic Flow Variables Using Video from Low-Flying Moving Platforms

Benjamin Coifman, The Ohio State University
Mark Hickman, University of Arizona
Pitu Mirchandani, University of Arizona
Rabi Mishalani, The Ohio State University
Research Needs in Air- and Space-Based Remote Sensing

Session 62 – Simmons 2

Sensors

Head Detection Inside Vehicles with a Modified SVM for Safer Airbags

R.A. Reyna, A. Giralt, and D. Esteve

A Lane Tracking System for Intelligent Vehicle Applications

K.A. Redmill, S. Upadhyay, A. Krishnamurthy, and U. Ozguner

Range Scan-Based Localization Methods for Mobile Robots in Complex Environments

L. Preucil, R. Mazl, and M. Kulich

Session 63 – Simmons 3

Vehicle Control

Design of Gyroscope-Free Navigation Systems

C. Tan, S. Park, K. Mostov, and P. Varaiya

Duplex Motion Planning Strategy for Automatic Manoeuvre of Vehicle in Complex Environment

J. Xu, M. Xie, and J. Lu

Winter Road Maintenance – ITS Options

V.P. Sisiopiku

Session 3 – Simmons 1

ITS for the Disabled

Session Organizer: Aristotelis Naniopoulos

A Flexible System Architecture for Rapid Algorithmic Prototyping of Multi Sensorial Driver Assistance Systems

T. Muller and S. Furst

Application and Optimization of Neural Field Dynamics for Driver Assistance

H. Edelbrunner, U. Handmann, C. Igel, I. Leeften, and W. von Seelen

Is ITS Ready for the Older Driver?

N. Stamatiadis

Including Elderly and Disabled in Intelligent Transport System Development and Application

A. Naniopoulos

Session 13 – Simmons 2

The Future of Traffic Monitoring

Session Organizer: H.J. van Zuylen

A High Performance License Plate Recognition System Based on the Web Technique

D. Yan, M. Hongqing, L. Jilin, and L. Langan

Adaptive Background Estimation for Real-Time Traffic Monitoring

D. Gao and J. Zhou

Improving Shadow Suppression in Moving Object Detection with HSV Color Information

R. Cucchiara, C. Grana, M. Piccardi, A. Prati, and S. Sirotti

Shadow Detection Algorithms for Traffic Flow Analysis: A Comparative Study

A. Prati, I. Mikic, C. Grana, and M.M. Trivedi

Session 23 – Simmons 3

Control

Fuzzy Traffic Signal Control in Major Arterials

J. Niittyaki, T. Kosonen, and R. Nevala

Hybrid Fuzzy Logic-Genetic Algorithm Technique for Automated Detection of Traffic Incidents on Freeways

D. Srinivasan, R.L. Cheu, and Y.P. Poh

A Fuzzy Decision Support System for Traffic Control Centers

A. Hegyi, B. De Schutter, S. Hoogendoorn, R. Babuska, H. van Zuylen, and H. Schuurman

Soft Computing System for Motion Control

C. Li and C. Lee

Session 33 – Simmons 4

Vehicle Control

Automatic Path Tracking Control of Vehicles Based on Lyapunov Approach

J.R. Zhang, S.J. Xu, and A. Rachid

H^∞ Steering Control of an Unmanned Vehicle Driving System by the MR Sensors

C.S. Kim, K.S. Park, J.I. Bae, and M.H. Lee

Hybrid Control in Automated Guided Vehicle Systems

S. Arora, A.K. Raina, and A.K. Mittal

Control of the Hopping Apparatus

V.B. Larin

Session 43 – OCC 208

Traffic Estimation

Session Organizer: Michael Bell

Traffic Flow Theory and Its Applications in Automated Vehicle Control: A Review

C. Tampere and B. van Arem

Sufficiency of Detector Information Under Incomplete Configuration for Intersection OD Estimation

C. Lan

A New Dynamic Traffic Control System: Performance of Adaptive Control Strategies for Over-Saturated Traffic

H.K. Lo, Y.C. Chan, and A.H.F. Chow

A Recursive Traffic Flow Predictor Based on Dynamic Generalized Linear Model Framework

C. Lan

Traffic Estimation in Munich: Practical Problems and Pragmatic Solutions

F. Logi, M. Ulrich, and H. Keller

Session 53 – OCC 210/211

Simulation

Computer Aided Testing and Evaluation of Adaptive Ramp Control Strategies

J. Hourdakis and P.G. Michalopoulos

A Simulation-Based Optimization Algorithm within a Dynamic Traffic Assignment Framework

A.S. Abdelfatah and H.S. Mahmassani

Traffic Forecast Using Simulations of Large Scale Networks

R. Chrobok, J. Wahle, M. Schreckenberg

Section-Wise Modeling of Traffic Flow and Its Application in Traffic State Estimation

J. Meier and H. Wehlan

Session 4 – Simmons 1

Sensors

Multilevel-Extension for Laserscanners

V. Willhoeft and K. Fuerstenberg

Object Tracking and Classification Using Laserscanners – Pedestrian Recognition in Urban Environment

K. Fuerstenberg and V. Willhoeft

Lane Detection and Street Type Classification Using Laser Range Images

J. Sparbert, K. Dietmayer, and D. Streller

A Laser Intensity Image Based Automatic Vehicle Classification System

H.M. Abdelbaki, K. Hussain, and E. Gelenbe

Session 14 – Simmons 2

Vehicle Control

A Control Authority Transition System for Collision Avoidance

T. Acarman, Y. Pan, and U. Ozguner

Access Control System with Neuro-Fuzzy Supervision

G. Adorni, S. Cagnoni, M. Gori, and M. Mordonini

A Vehicle-to-Vehicle Distance Control for Stop-and-Go Cruise Control

K. Yi, I. Moon, and Y.D. Kwon

A Dynamic Tire/Road Friction Model for 3D Vehicle Control and Simulation

X. Claeys, J. Yi, L. Alvarez, R. Horowitz, and C. Canudas de Wit

Session 24 – Simmons 3

Control

Collision Avoidance System for Fixed Obstacles – Fuzzy Controller Network for Robot Driving of an Autonomous Vehicle

U. Lages

Automobile Engine Fault Diagnosis Using Neural Network

S. Kher, P.K. Chande, and P.C. Sharma

Adaptive Controller Design of MEMS Gyroscopes

S. Park, R. Horowitz, and C. Tan

Active Steering Systems Based on Model Reference Adaptive Nonlinear Control

T. Fukao, S. Miyasaka, K. Mori, N. Adachi, and K. Osuka

Session 34 – Simmons 4

Vehicle Control

Real-Time Lane Detection for Autonomous Navigation

S.G. Jeong, C.S. Kim, K.S. Yoon, J.N. Lee, J.I. Bae,
and M.H. Lee

A Feature-Based Real-Time Traffic Tracking System Using Spatial Filtering

X. Liu, D. Yao, L. Cao, L. Peng, and Z. Zhang

Autonomous Underwater Vehicle Navigation Scheme for Cable Following

A. Balasuriya and T. Ura

Machine-Vision-Based Detection and Tracking of Stationary Infrastructural Objects Beside Innercity Roads

K. Fleischer and H. Nagel

Session 44 – OCC 208

Status of Traffic Flow

Session Organizer: Carlos Daganzo

Recent Findings on Simple Attributes of Freeway Queue Formation and Propagation

M.J. Cassidy

The PeMS Algorithms for Accurate, Real-Time Estimates of g -Factors and Speeds from Single-Loop Detectors

Z. Jia, C. Chen, B. Coifman, and P. Varaiya

The Freeway Access Control Problem – A Survey of Successes and Continuing Challenges

D.J. Lovell and W.S. Levine

Some Recent Developments in Traffic Flow Theory

H.M. Zhang and W. Lin

Session 54 – OCC 210/211

Simulation

Pedestrian Simulation Model for Hong Kong Underground Stations

J.Y.S. Lee, W.H.K. Lam, and S.C. Wong

To Simulate or Not to Simulate

J. Dahlgren

A Simulation Approach for Performance Evaluation of Proposed Automated Container Terminals

C.I. Li, H. Jula, P.A. Ioannou

Non-Convergence in Dynamic Assignment Networks?

R. Mounce

Session 5 – Simmons 1

Sensors

An Arterial Speed Estimation Model Fusing Data from Stationary and Mobile Sensors

R. Cheu, D. Lee, and C. Xie

Transit Vehicles as Traffic Probe Sensors

F.W. Cathey and D.J. Dailey

Speed-Vision: Speed Measurement by License Plate Reading and Tracking

G. Garibotto, P. Castello, E. Del Ninno,
P. Pedrazzi, and G. Zan

Formulation of a New Methodology to Identify Erroneous Paired Loop Detectors

J. Ametha, S. Turner, S. Darbha

Session 15 – Simmons 2

Image Analysis

Elastic Bands to Enhance Vehicle Following

S.K. Gehrig and F.J. Stein

Next Generation Tracking and Tracing – A New Integrated Approach

K. Jakobs, R. Williams, I. Graham, and A. Lloyd

Vehicle Shape Approximation from Motion for Visual Traffic Surveillance

G.S.K. Fung, N.H.C. Yung, and G.K.H. Pang

Mobile Visual Detection of Traffic Infrastructure

L. Paletta, G. Paar, and A. Wimmer

Session 25 – Simmons 3

Control

A Traffic Flow Forecast Supported System Based Multi-Agent

S. Ma, G. He, and S. Wang

Effects of Communication Delays on String Stability in Vehicle Platoons

X. Liu, S.S. Mahal, A. Goldsmith, and J.K. Hedrick

Isolated Ramp Metering Feedback Control Utilizing Mixed Sensitivity for Desired Mainline Density and the Ramp Queues

P. Kachroo, K. Ozbay, and D.E. Grove

A Methodological Framework for Integrated Control in Corridor Networks

Y. Pavlis and W. Recker

Session 35 – Simmons 4

Vehicle Control

Modeling of Human Behaviors in Real Driving Situations

T. Miyazaki, T. Kodama, T. Furuhashi, and H. Ohno

Voice Recording and Analysis in Locomotive Safety Controlling System

Z. Lu and T. Zhang

Road Environment Descriptions – A Database for Integrating Urban Environment Protection Aspects in Route Guidance Systems

F. Huber and H. Meiners

A Televiewing System for Multiple Simultaneous Customized Perspectives and Resolutions

B. Hall, K. Huang, and M. Trivedi

Session 45 – OCC 208

Traffic Theory

Performance Studies of a Network Adaptive Traffic Control Algorithm via Simulation Model

W. Wey and R. Jayakrishnan

Stochastic Modeling and Real-Time Estimation of Incident Effects on Surface Street Traffic Congestion

J. Sheu, Y. Chou, and A. Chen

Experimental Analysis of Different Simulation Models for Motorway Traffic Flow

D.C. Festa, G. Longo, G. Mazzulla, and G. Musolino

Non-Linear Analysis of Traffic Flow

A.S. Nair, J. Liu, L. Rilett, and S. Gupta

Session 55 – OCC 210/211

Simulation

VATSIM: A Simulator for Vehicles and Traffic

J. Lei, K. Redmill, and U. Ozguner

Genetic Algorithm-Based Combinatorial Parametric Optimization for the Calibration of Microscopic Traffic Simulation Models

T. Ma and B. Abdulhai

Genetic-Algorithms-Based Approach for Calibrating Microscopic Simulation Models

K. Kim and L.R. Rilett

Intelligent Agents in Decentralized Traffic Control

E.D. Ferreira, E. Subrahmanian, and D. Manstetten

Session 6 – Simmons 1

Sensors

Design of Dual-Duplex System and Evaluation of RAMS

H. Kim, J. Lee, K. Lee, and H. Lee

AFM Type of Non-Scanning Wide-Range

Ultrasonic Sensor for ALV

T. Emura and M. Kumagai

Advanced Range Sensor Processing Using DGPS and a Geospatial Database

A. Gorjestani, B. Newstrom, C. Shankwitz,
and M. Donath

Embedded Computer/Communication Sub-System for Bridge Vibration Control

V. DeBrunner, L.S. DeBrunner, M. Ta, J. Davis

Nonlinear Filter Road Vehicle Model Development

M. Wada, K.S. Yoon, H. Hashimoto

Session 16 – Simmons 2

Image Analysis

Vehicle Detection in Static Road Images with PCA-and-Wavelet-Based Classifier

J. Wu, X. Zhang, and J. Zhou

SVM-Based Detection of Moving Vehicles for Automatic Traffic Monitoring

D. Gao, J. Zhou, L. Xin

Using Topological Constraints as Context for the Joint Classification of Image Regions in a Traffic Environment

G Lorenz

Maintaining the Identity of Multiple Vehicles as They Travel Through a Video Network

G.T. Kogut and M.M. Trivedi

Session 26 – Simmons 3

Freight Transport Automation: New Developments

Session Organizer: Hugo Priemus

Underground Freight Transportation: A New Development for Automated Freight Transportation Systems in the Netherlands

B. Pielage

Logistic Control for Fully Automated Large Scale Freight Transport Systems; Event Based Control for the Underground Logistic System Schiphol

A. Verbraeck and C. Versteegt

Boosting Efficiency of Split Marine Container Terminals by Innovative Technology

K. Franke

Intelligent Road Rail Hybrid Transport: A New Modality for the Rhine-Schelde Delta

J.J.M. Evers

Strategies to Achieve a Quality Leap in Intermodal Rail or Barge Transportation

E. Kreutzberger

Session 36 – Simmons 4

Automation in Rail Systems

Session Organizer: E. Schnieder

Improving Railway Punctuality by Automatic Piloting

I.A. Hansen

A Feasibility Study of Train Automatic Stop Control Using Range Sensors

K. Yoshimoto, K. Kataoka, and K. Komaya

Modeling and Simulation of an Operation Concept for Future Rail Traffic

S. König and E. Schnieder

Recent Trends in Automatic Train Controls

J. Schutte

Session 46 – OCC 208

Traffic Theory

Spectral and Cross-Spectral Analysis of Urban Traffic Flows

A. Stathopoulos and M.G. Karlaftis

Preferred Time-Headway of Highway Drivers

T.J. Ayres, L. Li, D. Schleuning, and D. Young

Adaptive Turning Flow Estimation Based on Incomplete Detector Information for Advanced Traffic management

C. Lan

Toward Hybrid Dynamic Traffic Assignment – Models and Solution Procedures

Y. Chiu and H.S. Mahmassani

Session 56 – OCC 210/211

Simulation

Customized Simulation Modeling Using PARAMICS Application Programmer Interface

D. Lee, P. Chandrasekar, and R. Cheu

A Microscopic Traffic Simulation Model for the Evaluation of Toll Station Systems

V. Astarita, M. Florian, and G. Musolino

Shortest Paths in Randomly Time Varying Networks

R. Cerulli, P. Festa, and G. Raiconi

Microscopic Traffic Simulation with Reactive Driving Agent

P.A.M. Ehlert and L.J.M. Rothkrantz

Modular Representation of Urban Traffic Systems Based on Hybrid Petri Nets

A. Di Febraro, D. Giglio, and N. Sacco

Session 7 – Simmons 1

Communication

A Beam Control Array Antenna for Road to Vehicle Communications

Y. Yamasaki, M. Yasunaga, Y. Murakami,
and H. Moribe

Pre-Installation Assessment of DSRC Systems

C. Becker and A. Feld

Radio Wave Propagation Measurements in Tunnel Entrance Environment for Intelligent Transportation Systems Applications

A.V.B. da Silva and M. Nakagawa

Session 17 – Simmons 2

Image Analysis

Comparison Between Eigenfaces and Fisherfaces for Estimating Drive Pose

S. Lakshmanan, P. Watta, Y.L. Hou, and N. Gandhi

Unmanned Vehicle Control Using Simulation and Virtual Reality Techniques

T.W. van den Berg, W. Huiskamp,
and J.C. van den Heuvel

An Adaptive Windowing Prediction Algorithm for Vehicle Speed Estimation

T. Pai, W. Juang, and L. Wang

Session 27 – Simmons 3

ITS Architectures in Europe

Session Organizer: Antonio Marques

The Project OSSA and the Concept of Interoperable Simulation

V. Sebastian and A. Marques

OMNI– Open Model for Network-Wide Heterogeneous Intersection-Based Transport Management

C. Bachiller, S.A. Beraetta, and F. Biora

Deployment of European ITS Framework Architecture

G. Franco

Traffic Information Systems in the City of Barcelona (Traffic Web Site)

J.G. Ramon

Session 37 – Simmons 4

Vehicle Control

A Cooperative Driving System with Automated Vehicles and Inter-Vehicle Communication in Demo 2000

S. Tsugawa, S. Kato, K. Tokuda, T. Matsui,
and H. Fujii

**Fault Detection, Identification and Reconstruction
for Ground Vehicles**

R.H. Chen, H.K. Ng, J.L. Speyer, and D.L. Mingori

**Emergency Calls Location Using TDOA Technique
Along a Motorway Dedicated Cellular Radio Network**

M. Laouif, M. Heddebaut, and J.M. Rouvaen

Finding a Path in the Hierarchical Road Networks

C.K. Park, K. Sung, S. Doh, and S. Park

**Robustness and Performance Issues for Advanced
Control of Vehicle Dynamics**

L. Ganzelmeier, J. Helbig, and E. Schnieder

Session 47 – OCC 208

Decision Systems

Managing a Pool of Self Service Cars

N. Hafez, M. Parent, and J. Proth

Study on Intelligent Train Dispatching

L. Ping, N. Axin, L. Jia, and W. Fuzhang

**A Demand Driven Freight Transport System
for the Supply Chain**

I.G. Black and A. Halatsis

Session 57 – OCC 210/211

Special Panel 2: Traveler Information

Session Organizer: Hamed Benouar

Panelists:

John Cox – President, TANN

Larry Sweeney, Ph.D. – Vice President and
General Manager of ITS, Etak

Peter Dwyer – TravInfo Project, Parson-Brinckerhoff

Hary Voccola – Vice President, Navtek

Session 8 – Simmons 1

Communication

Inter-Vehicle Communication Based on Ultra-Wide Band and CDMA Techniques

F. Elbahhar, A. Rivenq-Menhaj, J.M. Rouvaen,
and M. Heddebaut

Space Division Multiple Access (SDMA) for Robust AdHoc Vehicle Communication Networks

S.V. Bana and P. Varaiya

Performance Comparisons of Inter-Vehicle Communication Networks Including the Modified V-PEACE Scheme Proposed

K. Fujimura and T. Hasegawa

Session 18 – Simmons 2

Transit

Wireless Content Delivery and User Profiling

C. Ng and C. Chen

Distributed Holding Control of Bus Transit Operations

J. Zhao, M. Dessoky, and S. Bukkapatnam

Transferability of Travel Time Models and Provision of Real-Time Arrival Time Information

A. Shalaby, C. Lyon, and T. Sayed

Real-Time Bus Information on Mobile Devices

S.D. Maclean and D.J. Dailey

Session 28 – Simmons 3

Systems

An Architecture for ITS Information Application Systems

J. Ren, Y. Zhang, Z. Li, and D. Hu

Development of Intelligent Transport Systems in Hong Kong

W.H.K. Lam

Operating Concepts for Urban Bus Automation and Inter-City Truck Automation

H.S.J. Tsao and J.L. Botha

Deploying the ITS Infrastructure in California

H. Benouar

Session 38 – Simmons 4

Special Panel 1: International Demos of Advanced Vehicle Control and Safety Systems

Session Organizer: Steve Shladover

Panelists:

Tom Alkim

Demo '98 Follow Up

Susumu Osawa
Introduction of Proving Test and Demo 2000 in Japan

Pete Zaniewski
*Demo 2003, Demonstrating the Benefits of
Automated Trucks and Transit Buses*

Session 48 – OCC 208

Decision Systems

Real-Time Recognition of Large-Scale Driving Patterns

J. Engstrom and T. Victor

Experimenting with Decision Support for Traffic Management

W.J. Knibbe and R. Kock

An Application of a Hybrid Fuzzy Logic and Expert System to Transportation Modal Split Evaluation

A.K. Prokopowicz and V. Sotnikov

Traffic Signal Networks Simulator Using Emotional Algorithm with Individuality

H. Ishihira and T. Fukuda

Session 58 – OCC 210/211

Special Panel 3: ITS Wireless

Session Organizers: Raja Sengupta and Ramez Gerges

Panelists:

Broady Cash
Tim Godfrey
Ramez Gerges
Sam Oyama

Session 9 – Simmons 1

Communication

**Lessons Learned in Interfacing Dynamic
Message Signs with a Trunked Radio System**

J.A. Kerenyi

**Designing a Traffic Management System to
Utilize a Digital Cable Network**

K.G. Aguigui, K.J. Fehon, and R. Raie

**Radio-On-Fiber Access Network Systems for
Road-Vehicle Communication**

Y. Okamoto, R. Miyamoto, and M. Yasunaga

**Communications Resources Management
for Advanced Telematics Applications**

R.J. Punnoose, R.S. Tseng, S. Wang,
P.V. Nikitin, T.E. Schlesinger, and D.D. Stancil

Session 19 – Simmons 2

Transit

**Path-Planning Algorithms for Public
Transportation Systems**

C. Liu, T. Pai, C. Chang, and C. Hsieh

**The CarLink II Pilot Program: Testing a
Commuter-Based Carsharing Model**

S. Shaheen and J. Wright

Busview: A Graphical Transit Information System

S.D. Maclean and D.J. Dailey

Session 29 – Simmons 3

Automation in Railway/Shipping

**Intelligent Simulation System for
Guangzhou-Shenzhen Railway Operation**

Y. Wang, L. Jia, N. Axin, and W. Fuzhang

**Evolution Programming Applied to the Railway Line
Design in the Presence of Terrain Obstacles**

W. Koc and K. Palikowska

**MOCONT: A New System for Automatic
Identification and Location of Containers**

R. Bozzo, A. Derito, R. Nurchi, and N. Ackroyd

Session 39 – Simmons 4

Marine

Session Organizer: Thomas Degre

**Dynamic Positioning Concepts and Strategies
for the Mobile Offshore Base**

A.R. Girard, J.B. de Sousa, and J.K. Hedrick

Vessel Management Expert System

T. Tran, C. Harris, and P. Wilson

River Information Services: A Joint European Effort to Enhance Safety and Usability of the Inland Waterway Network

I.A.A. ten Broeke, C.P.M. Willems,
and C.C. Glansdrop

ECDIS – The Intelligent Heart of the Hazard and Collision Avoidance System

B. Pillich and G. Buttgenbach

Session 49 – OCC 208

Decision Systems

Metricom’s Ricochet Network: Alternative New Technology for Traffic Signals

R.E. Davis, III and K.G. Aguigui

Non-Standard Safety Technology

Y. Pan, T. Acarman, and U. Ozguner

Road Traffic Indicators and Their Prediction

M. Danech-Pajouh

Towards Intelligent TeleGeomatic Transportation Systems for Environmental Monitoring

A. Boulmajoul and R. Laurini

Session 59 – OCC 210/211

Special Panel 4: ITS Deployment

Session Organizer: Hamed Benouar

Panelists:

Cyrus Minoofar – Alameda County Congestion Management Agency

Abbas Mohaddes – Senior Vice President, Iteris
Lessons Learned in ITS Deployment at a Glance

Janie Page – ITS Regional Coordinator, Metropolitan Transportation Commission

Susan Shaheen, Ph.D. – Research Scientist, University of California, PATH and Davis
CarLink’s Evolution: From Field Test to Pilot Program

Session 10 – Simmons 1

Communication

A Novel Method to Reduce the Estimation Variance of DCSK

H. Liu, Z.S. Jing, L.J. Bo, W.R. Chun,
and Z.L. Ping

Advanced Joint Mechanism in DSRC-Based ITS Networks and ITS Evaluation

T. Munka, T. Yamamoto, M. Kuroda,
and T. Watanabe

A Wireless Token Ring Protocol for Intelligent Transportation Systems

D. Lee, R. Attias, A. Puri, R. Sengupta,
S. Tripakis, and P. Varaiya

A Study on Encoding of Position Information Using Predictive Algorithms in Inter-vehicle Communications

Y. Goto and T. Hasegawa

Session 20 – Simmons 2

Transit

Automatic Fare Collection

A. Ampelas

Developing AFC Systems

H. Haddingh

A Comparison of Different Technologies for EFC and Other ITS Applications

J.G. Jordan, F. Soriano, D. Graullera, and G. Martin

Perspectives on ITS Standards for Public Transit

M. Hickman

Session 30 – Simmons 3

Control

The Measurement of Reliability in Stochastic Transport Networks

M.G.H. Bell

Efficiency versus Fairness in Network-Wide Ramp Metering

A. Kotsialos and M. Papageorgiou

A Decentralized Optical Control Scheme for Route Guidance in Urban Road Networks

R. Minciardi and F. Gaetani

Conflict Detection and Planar Resolution for Air Traffic Control

A. Inselberg

Session 40 – Simmons 4

ITS

Towards the Development of Intelligent Transportation Systems

L. Figueiredo, I. Jesus, J.A.T. Machado,
J.R. Ferreira, and J.L. Martins de Carvalho

An Economic Evaluation of Freeway Service Patrols

D. Levinson, P.K. Parthasarathi

Performance Evaluation of a Multi-Station Shared Vehicle System

M. Barth, J. Han, and M. Todd

Travel Card: Airport Self-Check In Using a Wireless PDS

T. Zimmerman, S. Ihde, K. Aalders, S. Wright,
M. Wirth, and S. Hopkirk

Validation of Advanced Transport Telematics Applications in 5 European Capitals

E. Negrenti and G. Valenti

Session 50 – OCC 208

Special Panel 6: ITS and Freight Transportation

Session Organizers: Amelia Regan and Jose Holguin-Veras

Panelists:

Hani Mahmassani
Lazar Spasovic
Amelia Regan
Jose Holguin-Veras

Session 60 - OCC 210/211

Special Panel 5: Location-Based Services

Session Organizer: Priya Viswanath

Uday Nagendran – Director of Mobile Services,
U.S. Wireless Corporation

Location-Based Services: Enabling Mobility from the Network

Julia Langley – Vice President of Corporate Development and Alliances, @Road Inc.

Web-Based Telematics: A Scalable Approach

Philip Klein – Chief Scientist, WaveMarket, Inc.

Moving Beyond Right Here Right Now with Location Intelligence

Tutorial 1
Sunday, August 26 – OCC 201
9 a.m. – Noon

Simulation Models in ITS System Design
Oakland Marriott Civic Center
Fee: \$55

Instructors:

Sumit Ghosh, Ph.D. Thomas E. Hattrick Professor of Information Systems Engineering and Director of the Computer Engineering Program and Secure Network Design Lab, Electrical and Computer Engineering Department, Stevens Institute of Technology, Hoboken, NJ. Prior to his appointment at Stevens, he was chair for research and graduate programs in the Computer Science and Engineering Department at Arizona State University and a member of the faculty at Brown University. He received his doctorate from Stanford University. Sghosh2@stevens-tech.edu

Tony Lee, Ph.D. Vitria Technology, Inc., Sunnyvale CA. Dr. Lee's current responsibilities include development of XML infrastructure within the BusinessWare platform. He is co-author with Dr. Ghosh of *Modeling and Synchronous Distributed Systems: Analyzing Complex Systems and Intelligent Transportation Systems: New Principles and Architectures*. He received his doctorate in computer engineering from Brown University. Tlee@vitria.com

Description:

One difficulty in ITS system design is lack of reliable, realistic traffic estimates that enable the system designer to predict traffic demand patterns. This tutorial provides students with an understanding of how to develop robust and accurate models by focusing on estimates of a few key traffic behaviors. Through interactive discussion and software demonstrations, students will learn why many large simulators, including MIT's simulator for the Boston Tunnel project, fail to meet criteria set by the Simulation Institute at the University of Central Florida in a project commissioned by the US DOT.

The tutorial begins by explores how to decompose complex ITS systems; how to develop models for individual components; and how to synthesize them into an asynchronous, distributed simulation that quickly executes autonomously on a network of workstations.

Applications of PeMS: A Freeway Performance Measurement System

Fee: \$150

Instructors:

Pravin Varaiya, Ph.D., Nortel Networks Distinguished Professor in the Department of Electrical Engineering and Computer Science at the University of California Berkeley. Varaiya is a Fellow of IEEE and a Member of National Academy of Engineers. He was Director, California PATH Program, 1994-97. He is a member of the Editorial Boards of Transportation Research-C, Economic Dynamics and Control, Discrete Event Dynamical Systems. varaiya@eecs.berkeley.edu

Also sharing in the instruction will be Chao Chen, Karl Petty, Alex Skabardonis, all members of the PeMS Development Group.

Description:

The Freeway Performance Measurement System (PeMS) project is a collaboration between California PATH program and Caltrans. PeMS receives traffic data from California highways and incident data from the California Highway Patrol, archives these data, and processes them in real time to produce useful information for the public, performance monitoring, operations, planners, and decision makers. PeMS will soon be deployed throughout California. PeMS is accessed over the Internet at

<http://transacct.eecs.berkeley.edu/>

The PeMS tutorial will cover:

- PeMS design goals, communications, hardware, and software architectures
- The routine applications of PeMS
- Findings about traffic behavior that depend on analysis of massive amount of data
- The major data processing algorithms
- Future developments

For an introduction to PeMS see [Introduction](http://paleale.eecs.berkeley.edu/~varaiya/papers_ps.dir/PeMSTutorial.pdf) (http://paleale.eecs.berkeley.edu/~varaiya/papers_ps.dir/PeMSTutorial.pdf)



Traffic Flow Modeling and Control

Fee: \$150

Instructors:

Prof. Markos Papageorgiou, Technical University of Crete, Greece

Prof. Alexander Skabardonis, Associate Research Engineer Institute of Transportation Studies, and Adjunct Professor of Civil Engineering, University of California Berkeley, USA. Dr. Skabardonis has been researching traffic engineering and control systems for over 20 years. Recent projects include freeway service evaluation, control strategies and route guidance for signal control networks and ATMIS modeling tools. He teaches courses in ITS in the graduate engineering program.

Description:

The design, analysis, and evaluation of Intelligent Transportation Systems (ITS) requires a thorough knowledge of traffic flow analysis techniques as well as of powerful methodologies from the areas of optimization, control, networks, and dynamic systems. The purpose of this workshop is to provide an overview of the most significant methods and their applications for traffic flow modeling and control.

Traffic Flow Modeling: The course will begin with traffic flow modeling and validation that includes a coverage of the various traffic flow models, the modeling of traffic networks, and simulation tools. Next, the models' practical application and suitability for the evaluation of various ITS scenarios will be discussed. Emphasis will be placed on the underlying models' theory, calibration and validation procedures, and analysis of the results.

Traffic Control: The state-of-the art techniques on freeway control, road traffic control, and integrated control employing ramp metering, signal control, and route guidance via application of modern optimization, control, and estimation techniques, together with several case studies will be presented.

Author Index

A

Aalders, K. 29
Abdelbaki, H.M. 16
Abdelfatah, A.S. 15
Abdulhai, B. 19
Abrams, R.A. 12
Acarman, T. 16, 27
Ackroyd, N. 26
Adachi, N. 16
Adorni, G. 16
Aguigui, K.G. 26, 27
Alkim, T. 24
Alvarez, L. 10, 10, 16
Ametha, J. 18
Ampelas, A. 28
Andres, C.M. 12
Angel, A. 13
Arora, S. 15
Astarita, V. 9, 21
Attias, R. 28
Axin, N. 23, 26
Ayres, T.J. 21

B

Babuska, R. 14
Bachiller, C. 22
Bae, H.S. 11
Bae, J.I. 15, 17
Bai, L.H. 12
Balasuriya, A. 17
Bana, S.V. 11, 24
Barth, M. 29
Becker, C. 22
Bell, M.G.H. 28
Benouar, H. 24
Bensrhair, A. 12
Beraetta, S.A. 22
Bertozzi, M. 12
Bielefeldt, C. 9
Biora, F. 22
Black, I.G. 23
Bo, L.J. 28

Bogenberger, K. 10
Botha, J.L. 24
Boulmajoul, A. 27
Bozzo, R. 26
Broggi, A. 12
Bukkapatnam, S. 24
Busch, F. 9
Buttgenbach, G. 27

C

Cagnoni, S. 16
Canudas de Wit, C. 16
Cao, L. 17
Cash, B. 25
Cassidy, M.J. 11, 17
Castello, P. 18
Cathey, F.W. 18
Cerulli, R. 21
Chan, Y.C. 15
Chande, P.K. 16
Chandnani, D. 13
Chandrasekar, P. 21
Chang, C. 26
Chen, A. 19
Chen, B. 11
Chen, C. 17, 24
Chen, R.H. 23
Chen, S. 12
Chen, Y. 9
Cheng, H.H. 11
Cherrett, T. 9
Cheu, R. 18, 21
Cheu, R.L. 14
Chiu, Y. 21
Choi, W. 10
Chou, Y. 19
Chow, A.H.F. 15
Chrobok, R. 15
Chun, W.R. 28
Claeys, X. 16
Coifman, B. 11, 11,
13, 13, 17
Cox, J. 23
Cucchiara, R. 14

D

da Silva, A.V.B. 22
Dahlgren, J. 17

Hearn, D.W.	12	Kachroo, P.	11, 18
Heddebaut, M.	23, 23	Karlaftis, M.G.	21
Hedrick, J.K.	18, 26	Kataoka, K.	21
Hegyi, A.	14	Kato, S.	22
Helbig, J.	23	Keller, H.	10, 15
Hellinga, B.	12	Kerenyi, J.A.	26
Heylliar, J.	10	Kerner, B.S.	10
Hickman, M. .	13, 13, 13, 28	Kher, S.	16
Hobeika, A.G.	11	Kim, C.S.	15, 17
Holguin-Veras, J.	29	Kim, H.	20
Hongqing, M.	14	Kim, K.	19
Hoogendoorn, S.	14	Kitajima, T.	11
Hopkirk, S.	29	Klein, P.	29
Horowitz, R.	10, 16, 16	Knibbe, W.J.	25
Hou, Y.L.	22	Kobayashi, H.	9
Hourdakis, J.	15	Koc, W.	26
Hsieh, C.	26	Kock, R.	25
Hu, D.	24	Kodama, T.	19
Huang, K.	19	Kogut, G.T.	20
Huber, F.	19	Komaya, K.	21
Huiskamp, W.	22	König, S.	21
Hussain, K.	16	Kosonen, T.	14

I

Igel, C.	14	Kreutzberger, E.	21
Ihde, S.	29	Krishnamurthy, A.	13
Ilagorre, G.	10	Kruse, G.	9
Inselberg, A.	28	Kuhne, R.D.	12
Ioannou, P.A.	17	Kulich, M.	13
Ishihra, H.	25	Kumagai, M.	20
		Kummerer, B.	12
		Kuroda, M.	28
		Kwon, Y.D.	16

J

Jakobs, K.	18
Jayakrishnan, R.	10, 19
Jeong, S.G.	17
Jesus, I.	29
Jia, L.	23, 26
Jia, Z.	17
Jilin, L.	14
Jing, Z.S.	28
Jordan, J.G.	28
Joshi, R.R.	9
Juang, W.	22
Jula, H.	17

K

Kachani, S.	12
------------------	----

L

Lages, U.	16
Lai, A.H.S.	12
Lakshmanan, S.	22
Lam, W.H.K.	17, 24
Lan, C.	15, 15, 21
Langan, L.	14
Langley, J.	29
Laouif, M.	23
Larin, V.B.	15
Laurini, R.	27
Lee, C.	14
Lee, D.	18, 21, 28
Lee, H.	20
Lee, J.	20
Lee, J.N.	17

Lee, J.Y.S.	17	Mingori, D.L.	23
Lee, K.	20	Minootar, C.	27
Lee, M.H.	15, 17	Mirchandani, P.	13, 13
Leefken, I.	14	Mishalani, R.	13, 13
Lei, J.	19	Mittal, A.K.	15
Levine, W.S.	17	Miyamoto, R.	26
Levinson, D.	29	Miyasaka, S.	16
Li, C.	14	Miyazaki, T.	19
Li, C.I.	17	Mohaddes, A.	27
Li, L.	21	Moon, I.	16
Li, Z.	24	Mordonini, M.	16
Lin, W.	11, 11, 17	Mori, K.	16
Link, B.	11	Moribe, H.	22
Liu, C.	26	Morris, R.	9
Liu, H.	28	Mostov, K.	13
Liu, J.	19	Mounce, R.	17
Liu, X.	17, 18	Mousset, S.	12
Lloyd, A.	18	Muller, T.	14
Lo, H.K.	15	Munka, T.	28
Logi, F.	15	Munoz, L.	10
Longo, G.	19	Murakami, Y.	22
Lorenz, G.	20	Musolino, G.	19, 21
Lovell, D.J.	17		
Lu, J.	13		
Lu, Z.	19		
Lyon, C.	24		

M

Ma, S.	9, 18
Ma, T.	19
Machado, J.A.T.	29
Maclean, S.D.	24, 26
Mahal, S.S.	18
Mahmassani, H.S.	15, 21, 29
Mahut, M.	10, 10, 10
Manstetten, D.	19
Marques, A.	22
Martin, G.	28
Martins de Carvalho, J.L.	29
Matsui, T.	22
Mazl, R.	13
Mazzulla, G.	19
Meier, J.	15
Meiners, H.	19
Mertz, J.	9
Michalopoulos, P.G.	15
Miche, P.	12
Mikic, I.	14
Minciardi, R.	28

N

Nagel, H.	17
Nagendran, U.	29
Nair, A.S.	19
Nakagawa, M.	22
Naniopoulos, A.	14
Negrenti, E.	29
Nevala, R.	14
Newstrom, B.	20
Ng, C.	24
Ng, H.K.	23
Niittyaki, J.	14
Nikitin, P.V.	26
Nurchi, R.	26

O

Ober-Sundermeier, A.	12
Ohno, H.	19
Okamoto, Y.	26
Osawa, S.	25
Osuka, K.	16
Oyama, S.	25
Ozbay, K.	11, 18
Ozguner, U.	11, 13, 16, 19, 27

P

Paar, G.	18
Page, J.	27
Pai, T.	22, 26
Palen, J.	11
Paletta, L.	18
Palikowska, K.	26
Pan, Y.	16, 27
Pang, G.K.H.	18
Papageorgiou, M.	9, 28
Parent, M.	23
Park, C.K.	23
Park, K.S.	15
Park, S.	13, 16, 23
Parks, J.	11
Parthasarathi, P.K.	29
Pavlis, Y.	18
Pedrazzi, P.	18
Peeta, S.	9
Peng, L.	17
Perakis, G.	12
Peynaud, J.	10
Piccardi, M.	14
Pielage, B.	20
Pillich, B.	27
Ping, L.	23
Ping, Z.L.	28
Poh, Y.P.	14
Poirier, P.	10
Pooran, F.J.	12
Prati, A.	14, 14
Preucil, L.	13
Prokopowicz, A.K.	25
Proth, J.	23
Punnoose, R.J.	26
Puri, A.	28
Pyo, J.	9

Q

Quek, K.H.	10
-----------------	----

R

Rachid, A.	15
Raconi, G.	21
Raie, R.	26
Raina, A.K.	15
Rajagopal, K.R.	10

Ramana, M.V.	12
Ramon, J.G.	22
Recker, W.W.	10, 18
Redmill, K.A.	11, 13, 19
Regan, A.	29
Remy, J-G.	9
Ren, J.	24
Reyna, R.A.	13
Rice, J.	12
Rilett, L.R.	19, 19
Rivenq-Menhaj, A.	24
Rothkrantz, L.J.M.	21
Rouvaen, J.M.	23, 24
Rubio-Ardanaz, J.M.	12
Ryu, J.	11

S

Sacco, N.	21
Sayed, T.	24
Schlesinger, T.E.	26
Schleuning, D.	21
Schnieder, E.	21, 23
Schon, T.	9
Schreckenber, M.	15
Schutte, J.	21
Schuurman, H.	14
Sebastian, V.	22
Sengupta, R.	28
Shaheen, S.	26, 27
Shalaby, A.	24
Shankwitz, C.	20
Sharma, P.C.	16
Shaw, B.D.	11
Sheu, J.	19
Shin, D.	9
Shin, D.H.	11
Shyu, M.	12
Sirotti, S.	14
Sisiopiku, V.P.	13
Soriano, F.	28
Sotnikov, V.	25
Sparbert, J.	16
Spasovic, L.	29
Speyer, J.L.	22
Srikanthan, T.	10
Srinivasan, D.	14
Stamatiadis, N.	14
Stancil, D.D.	26
Stathopoulos, A.	21

Stein, F.J.	18
Streller, D.	16
Subrahmanian, E.	19
Sung, K.	23
Sung, T.	9
Sung, T.K.	11
Swaroop, D.	10, 10
Sweeney, L.	23

T

Ta, M.	20
Tampere, C.	15
Tan, C.	13, 16
ten Broeke, I.A.A.	27
Todd, M.	29
Tokuda, K.	22
Toulminet, G.	12
Toy, C.	10
Tran, T.	26
Tremblay, N.	10
Tripakis, S.	28
Trivedi, M.M.	14, 19, 20
Tsao, H.S.J.	24
Tseng, R.S.	26
Tsugawa, S.	22
Turner, S.	18

U

Ulrich, M.	15
Upadhya, S.	13
Ura, T.	17

V

Valenti, G.	29
van Arem, B.	15
van den Berg, T.W.	22
van den Heuvel, J.C.	22
van Zuylen, H.	14
van Zwet, E.	12
Varaiya, P.	11, 13, 17, 24, 28
Velan, S.	10
Verbraeck, A.	20
Versteegt, C.	20
Victor, T.	25
Voccola, H.	223
von Seelen, W.	14
Vukanovic, S.	10

W

Wada, M.	20
Wahle, J.	15
Wang, L.	22
Wang, S.	18, 26
Wang, Y.	26
Watanabe, T.	28
Watta, P.	22
Wehlan, H.	15
Wei, H.	11
Weichenmeier, F.	9
Wey, W.	11, 19
Willems, C.P.M.	27
Willhoeft, V.	16, 16
Williams, R.	18
Wilson, P.	26
Wimmer, A.	18
Wirth, M.	29
Wong, S.C.	17
Wright, J.	26
Wright, S.	29
Wu, J.	20
Wu, J.H.	12

X

Xie, C.	18
Xie, M.	13
Xin, L.	20
Xu, J.	13
Xu, S.J.	15
Xuanqin, M.	11

Y

Yamamoto, T.	28
Yamasaki, Y.	22
Yan, D.	14
Yan, W.	11
Yang, T.	9
Yao, D.	17
Yasunaga, M.	22, 26
Ygnace, Y.	9
Yi, J.	10, 16
Yi, K.	16
Yildirim, M.B.	12
Yong, W.	11
Yoon, K.S.	17, 20
Yoshimoto, K.	21

Young, D.	11	Zhang, J.R.	15
Yung, N.H.C.	12, 18	Zhang, T.	19
		Zhang, X.	20
		Zhang, Y.	24
		Zhang, Z.	17
Zackor, H.	12	Zhao, J.	24
Zan, G.	18	Zhou, J.	14, 20, 20
Zaniewski, P.	25	Zhu, Y.	12
Zhang, C.	12	Zimmerman, T.	29
Zhang, H.M.	10, 17		

Z

Organizing Committee

Conference Co-Chairs:

Prof. Pravin Varaiya, UC-Berkeley
varaiya@eecs.berkeley.edu

Mr. Hamed Benouar, Caltrans and UC-Berkeley
Hamed_Benouar@dot.ca.gov

Program Chair:

Prof. Daniel J. Dailey, University of Washington
dailey@its.washington.edu

Publication Chair:

Mr. Bill Stone, California PATH
bstone@uclink4.berkeley.edu

Publicity Co-Chairs:

Dr. Patrick Conroy, California PATH
pconroy@path.berkeley.edu

Prof. Alberto Broggi, University of Pavia
broggi@CE.UniPR.IT

Tutorial Co-Chairs:

Dr. Alex Skabardonis, UC-Berkeley, Inst. of Trans. Studies
dromeas@uclink4.berkeley.edu

Dr. Linda Howe, UC-Berkeley, Inst. of Trans. Studies
lhowe@its.berkeley.edu

Local Arrangement Co-Chairs:

Dr. Judy Chen, Caltrans, District 4
Judy_Chen@dot.ca.gov

Mr. Peter Ray, UC-Berkeley
pray@eecs.berkeley.edu

Exhibition Chair:

Mr. Bob Ratcliff, CAATS
robert_catcliff@caats.org

Registration Chair:

Ms. Kari Hansen, UC-Berkeley
kari@eecs.berkeley.edu


Advisory Committee:

Prof. Umit Ozguner, Ohio State University
u.ozguner@ieee.org

Prof. Richard Klafter, Temple University
r.klafter@ieee.org

Dr. Ichiro Masaki, Massachusetts Institute of Technology
i.masaki@ieee.org

ITSC'01 Program at a Glance

	Saturday August 25	Sunday August 26	Monday August 27	Tuesday August 28	Wednesday August 29	Thursday August 30
8:30 a.m.		Tutorial 1 Tutorial 2 Tutorial 3	Welcome / Plenary I *	Session 3 Session 13 Session 23 Session 33 Session 43 Session 53	Session 7 Session 17 Session 27 Session 37 Session 47 Session 57	Technical Tour 1 Technical Tour 2 Technical Tour 3
10:00 a.m.	BREAK	BREAK	BREAK	BREAK	BREAK	
10:30 a.m.		ITSC Excom Tutorial 1 Tutorial 2 Tutorial 3	Plenary I	Session 4 Session 14 Session 24 Session 34 Session 44 Session 54	Session 8 Session 18 Session 28 Session 38 Session 48 Session 58	
12:00 p.m.	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH / Plenary II *	
1:30 p.m.						
3:00 p.m.	ITSC Committees	ITSC Council Tutorial 2 Tutorial 3	Session 1 Session 11 Session 21 Session 31 Session 41 Session 51	Session 5 Session 15 Session 25 Session 35 Session 45 Session 55	Session 9 Session 19 Session 29 Session 39 Session 49 Session 59	
3:30 p.m.						
5:00 p.m.		ITS Council Tutorial 2 Tutorial 3	Session 2 Session 12 Session 22 Session 32 Session 42 Session 52	Session 6 Session 16 Session 26 Session 36 Session 46 Session 56	Session 10 Session 20 Session 30 Session 40 Session 50 Session 60	
6:30 p.m.						
8:00 p.m.		Reception *	Session 61 Session 62 Session 63	Banquet *		

***Special Events:**

- Reception
Sunday, August 26
6:30 p.m.
Marriott Topper Room
- Welcome / Plenary I
Monday, August 27
8:30 a.m.
Marriott Jewett Ballroom
- Banquet
Tuesday, August 28
6:30 p.m.
Marriott Jewett Ballroom
- Luncheon / Plenary II
Wednesday, August 29
12:00 p.m.
Marriott Jewett Ballroom
- Speaker
Thursday, August 30
6:30 p.m.
Marriott Jewett Ballroom