

12th IFAC Symposium on Control in Transportation Systems 2009

**Redondo Beach, California, USA
2-4 September 2009**

ISBN: 978-1-61567-991-1

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2009) by the International Federation of Automatic Control (IFAC)
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact the publisher, International Federation of Automatic Control (IFAC)
at the address below.

IFAC Secretariat
Schlossplatz 12
A-2361 Laxenburg
Austria

Phone: +43 2236 71 447
Fax: +43 2236 72 859

secretariat@ifac-control.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Control of Day-To-Day Route Choice in Traffic Networks with Overlapping Routes	1
<i>Monique van den berg, Bart De Schutter, Hans Hellendoorn, Andreas Hegyi</i>	
Experimental Validation of Unknown Inputs Estimation of Heavy Vehicle Via High Order Sliding Mode Observer	7
<i>Hocine Imine, Abdelaziz Benallegue, Leonid M. Fridman</i>	
Optimal Mainstream Traffic Flow Control of Motorway Networks	14
<i>Rodrigo Castelan Carlson, Ioannis Papamichail, Markos Papageorgiou, Albert Messmer</i>	
On Traffic Flow Modelling with Phase Transition: An Energy Concept	20
<i>Aziz NAKRACHI</i>	
Aurora Road Network Modeler	27
<i>Alex A. Kurzhanskiy, Jaimyoung Kwon, Pravin P. Varaiya</i>	
Set-Valued Estimation of Freeway Traffic Density	34
<i>Alex A. Kurzhanskiy</i>	
Model Based Measurement of Railway Track Irregularities	41
<i>Martin Baier, Wolfgang Rulka, Dirk Abel</i>	
Simulation and Evaluation of Collective Taxi Systems	47
<i>Eugenie Lioris, Guy Cohen, Arnaud de La Fortelle</i>	
Modelling of Traffic Safety and Operation in Urban Networks	55
<i>Anan Abu Farha, Eckehard Schnieder, Stefan Detering</i>	
Model Predictive Control for Multi-Class Traffic Flows	61
<i>Puspita Deo, Bart De Schutter, Andreas Hegyi</i>	
Model-Based Traffic Control for Balanced Reduction of Fuel Consumption, Emissions, and Travel Time	67
<i>Solomon Kidane Zegeye, Bart De Schutter, Hans Hellendoorn, Ewald Breunesse</i>	
State Dependent Ramp Metering Control of Motorway Bottlenecks Using Non-Linear Pole Assignment	73
<i>C. James Taylor, Arun Chotai</i>	
A Simplified Macroscopic Urban Traffic Network Model for Model-Based Predictive Control	79
<i>Shu Lin, Bart De Schutter, Yugeng Xi, Hans Hellendoorn</i>	
Multi-Vehicle Adaptive Cruise Control with Collision Avoidance in Multiple Transitions	85
<i>Seung-Wuk Moon, Kyongsu Yi, Hyoung-Jin Kang</i>	
Designing Fuzzy Controller and Real Time Experimental Studies on a Nonholonomic Robot	93
<i>Pourya Shahmaleki, Mojtaba Mahzoon, Venus Shahmaleki</i>	
Modelling for the Optimal Sizing of an Automatic Intermodal Freight Terminal	101
<i>Claudia Caballini, Pier Paolo Puliafito, Simona Saccone, Silvia Siri</i>	
An Improved Methodology to Generate a Digital Road Network Using Location Positioning Data of Probe Vehicles	108
<i>hideaki ito, Yoshiki Suga, toru higashi, yasuo asakura</i>	
An Investigation into Integrated Human Driver Model for Closed-Loop Simulation of Intelligent Safety System	114
<i>Taeyoung Lee, Juyong Kang, Kyongsu Yi, Kihan Noh</i>	
Agent-Based Evolutionary Game-Theoretic Framework for Optimizing Investment Plans of Competitive Port Facilities	122
<i>Loukas Dimitriou, Antony Stathopoulos</i>	
Integrating Traffic Data and Model Predictive Control to Improve Fuel Economy	130
<i>Nicholas Kohut, Karl Hedrick, Borrelli Francesco</i>	
The Implementation of the Safespot Architecture on a Powered Two-Wheeler Vehicle	136
<i>Vincenzo Manzoni, Fabio Codecà, Sergio Savaresi, Paolo Cravini</i>	
Predictive Route Choice Control of Destination Coded Vehicles with Mixed Integer Linear Programming Optimization	142
<i>Alina Tarau, Bart De Schutter, Hans Hellendoorn</i>	
Decentralized Route Choice Control of Automated Baggage Handling Systems	148
<i>Alina Tarau, Bart De Schutter, Hans Hellendoorn</i>	
Adaptive Performance Optimization for Large-Scale Traffic Control Systems	154
<i>Anastasios Kouvelas, Elias Kosmatopoulos, Markos Papageorgiou, Konstantinos Aboudolas</i>	
A Multimodal Traffic Responsive Strategy Using Particle Swarm Optimization	162
<i>Sofiene KACHROUDI, Neila BHOURI</i>	

Coordination Concepts for Ramp Metering Control in a Freeway Network	169
<i>Yufei Yuan, Winnie Daamen, Serge P. Hoogendoorn, Jos Vrancken</i>	
An Empirical Model of Occupancy-Queue Relation.....	176
<i>Jan Prikryl, Jus Kocjan</i>	
Aggregation Bias in Traffic Flow Time Series: The Effects of Ignoring It	182
<i>Eleni Vlahogianni, Mathew Karlaftis</i>	
Analysis of Off-Peak Traffic Signal Operations.....	187
<i>Anuar Amanzholov, Ardeshir Faghri, Reza Taromi, Earl Rusty Lee</i>	
Utilization of GPS Travel Time and Delay Data for Optimal Routing	193
<i>Shilpa Mallem, Ardeshir Faghri, Reza Taromi, Tracy DeLiberty</i>	
Requirements for Precise Simulation Models for Traffic Flow Optimizing ADAS	200
<i>Stefan Detering, Eckehard Schnieder</i>	
Bayesian Calibration of Car-Following Models	205
<i>Chris Philip IJssbrand van Hinsbergen, Hans van Lint, Serge P. Hoogendoorn, Henk J. van Zuylen</i>	
Virtual Analyzers in Management Information Systems for Logistic Cycle of Production Process	212
<i>Natalia Bakhtadze, Vladimir Lototsky</i>	
Real-Time Density Estimation on Freeways with Loop Detector and Probe Data.....	216
<i>Tony Z. Qiu, Xiao-Yun Lu, Andy H.F. Chow</i>	
A Generic Method to Optimize Instructions for the Control of Evacuations	222
<i>Olga Huijregtse, Serge P. Hoogendoorn, Adam John Pel, Michiel Bliemer</i>	
Models to Predict Traffic Volatility in Transportation Networks	229
<i>Theodore Tsekeris, Antony Stathopoulos</i>	
Link Vehicle-Count-the Missing Measurement for Traffic Control	235
<i>Markos Papageorgiou, Pravin P. Varaiya</i>	
Accuracy of Optimum Road Pricing Considering Local Emissions of Road Traffic Network	241
<i>Nataraju Jakkula, Yasuo Asakura</i>	
Efficient Particle-Based Estimation of Marginal Costs in a First-Order Macroscopic Traffic Flow Model	248
<i>Frank Zuurbier, Andreas Hegyi, Serge P. Hoogendoorn</i>	
Utilizing Road Grade Preview for Increasing Fuel Economy of Hybrid Vehicles.....	256
<i>Chen Zhang, Ardalan Vahidi, Pierluigi Pisu, Xiaopeng Li, Tennant Keith</i>	
On the Use of XML for Port Communications.....	262
<i>Burkhard Englert, Shui Lam</i>	
Fiber Optic Sensors for Transportation Infrastructural Health Monitoring	270
<i>Chin Chang, Rahul Mehta</i>	
Reduced Order Hinfinity Control Design of a Nose Landing Gear Steering System.....	277
<i>G. Pouly, Jean-Philippe Lauffenburger, Michel Basset</i>	
Integration of Electric Pedal Assisted Bikes in a Bike-Sharing System	283
<i>Vincenzo Manzoni, Fabio Codecà, Alessandro Moia, Sergio Savaresi</i>	
The Neuro-Fuzzy Adaptive Anti-Sway Crane Control System.....	291
<i>Jaroslaw Smoczek, Janusz Szymko</i>	
Analysis of Fastest and Shortest Paths in an Urban City Using Live Vehicle Data from a Vehicle-To-Infrastructure Architecture	297
<i>Jeffrey Miller</i>	
Aurora Arterial Modeler-A Macroscopic Tool for Urban Traffic Signal Control.....	302
<i>Andy H.F. Chow, Gabriel Gomes, Alex A. Kurzhanskiy, Pravin P. Varaiya</i>	
Fundamental Diagram Modeling and Analysis Based NGSIM Data	308
<i>Xiao-Yun Lu, Pravin P. Varaiya, Roberto Horowitz</i>	
An Equivalent Second Order Model with Application to Traffic Control.....	316
<i>Xiao-Yun Lu, Pravin P. Varaiya, Roberto Horowitz</i>	
Measurement of Occupancy of Heterogeneous Traffic Using Simulation Technique.....	324
<i>Thamizh Arasan Venkatachalam, Dhivya Gnanavelu</i>	
Generation of Coordinated Control Regions for Road Network Using Hypergraph Models	330
<i>Houli DUAN, Zhiheng LI, Yi ZHANG</i>	
Large-Scale Traffic Simulation Tools for Planning and Operations Management.....	336
<i>Ramachandran Balakrishna, Daniel Morgan, Howard Slavin, Qi Yang</i>	
Design of Path Tracking and Collision Avoidance Controller for Autonomous Vehicle	342
<i>Dongwook Kim, Jae Mann Park, Seung-Wuk Moon, Juyong Kang, H. Jin Kim, Kyongsu Yi</i>	
Macroscopic Modeling and Simulation of Freeway Traffic Flow.....	350
<i>Jan Hueper, Gunes Dervisoglu, Ajith Muralidharan, Gabriel Gomes, Roberto Horowitz, Pravin P. Varaiya</i>	
Urban Traffic Control Via Stackelberg-Nash Equilibria.....	355
<i>Israel Alvarez, Alexander S. Poznyak</i>	

Integrated Simulation of Freeway Traffic Flow and Container Terminal Operation: Framework and Case Study.....	361
<i>Hwan Chang, Hossein Jula, Anastasios G. Chassiakos, Petros A. Ioannou</i>	
Honeybee Social Foraging for Urban Traffic Control.....	367
<i>Pablo Nanez, Nicanor Quijano</i>	
A Survey on Effects of ITS -related Systems and Technologies on Global Warming Prevention.....	373
<i>Sadayuki Tsugawa</i>	
Transportation Network User Equilibrium Assignment by Ant Colony Systems with a Variable Trail Decay Coefficient	381
<i>lorenzo musrone, Matteo Matteucci, ahmed ghazia</i>	
Environmentally Beneficial Intelligent Transportation Systems.....	389
<i>Matthew Barth, Kanok Boriboonsomsin</i>	
Developing Successful Autonomous Ground Vehicles: Lessons Learned from DARPA Challenges.....	393
<i>Gregory Kehoe, Hossein Jula, Fariba Ariaei</i>	
Model Splitting and First Order Sliding Mode Observers for Estimation and Diagnosis in Vehicle	401
<i>Belgacem JABALLAH, nacer msirdi, aziz naamane, Hassani Messaoud</i>	
Lane Change Guidance for Freeway Incident Management.....	407
<i>Yun Wang, Hwan Chang, Petros A. Ioannou</i>	
PortSec: Port Security Risk Management and Resource Allocation System.....	412
<i>Michael Orosz, Carl Southwell, Anthony Barrett, Onur Bakir, Jennifer Chen, Isaac Maya</i>	
Driver Monitoring and Warning System for Active Safety Enhancement	420
<i>Burak Cayir, Tankut Acarman, Emrah Yuruklu</i>	
Improving Travel Time Reliability Using Ramp Metering: Field Assessment Results on the A6W Motorway in Paris	426
<i>Neila BHOURI, Habib Haj-Salem</i>	
Modelling of the European Rail Traffic Management System (ERTMS) for Checking Objectives	432
<i>sana Jabri, El miloudi El koursi, Etienne Lemaire, Thomas Bourdeaud'huy</i>	
Development and Evaluation of Bus Priority Scenarios Via Microscopic Simulation Models.....	439
<i>George Papageorgiou, Petros A. Ioannou, Andreas Pitsillides, Thrasos Aphamis, Athanasios Maimaris</i>	
Online Travel Time Estimation in Urban Areas Using the Occupancy of Long Loop Detectors.....	447
<i>Willem K. Mak, Francesco Viti, Serge P. Hoogendoorn, Andreas Hegyi</i>	
Adaptive Control Design for Cargo Ship Steering with Limited Rudder Angle	455
<i>Nazli E. Kahveci, Petros A. Ioannou</i>	
PD/PID-Switching Control As a Human-Machine Interface for a Semi-Autonomous Driver in Automobiles.....	463
<i>Mirko Nentwig, Paolo Mercorelli</i>	
Dynamic Modeling of a Train of Intelligent Vehicles Inside a Confined Space.....	471
<i>Wissam KHALIL, Rochdi Merzouki, Belkacem Ould Bouamama</i>	
Mode Switching and Smooth Motion Generation for Adaptive Cruise Control Systems by a Virtual Lead Vehicle.....	479
<i>Sang Gyum Kim, Masayoshi Tomizuka, Kuo-Hsiang Cheng</i>	
Hardware-In-The-Loop On-Ramp Simulation Tool to Debug and Test the Universal Ramp Metering Software.....	486
<i>Rene Omar Sanchez, Roberto Horowitz, Pravin P. Varaiya</i>	
Modeling Driving Responses to Vehicle-To-Vehicle Hazard Alerts in Freeway Traffic.....	492
<i>Hwasoo Yeo, Steven Shladover</i>	
Stochastic Models of Traffic Flow Interrupted by Incidents	499
<i>Melike Baykal-Gursoy</i>	
Cost-Based Optimization of Shipment Scheduling	507
<i>Shui Lam, Burkhard Englert</i>	
A Semantic Framework for Integrated Modeling and Simulation of Transportation Systems	513
<i>Qunzhi Zhou, Viktor Prasanna, Hwan Chang, Yun Wang</i>	
Navigation-Based Speed Profile Generation for an Open Road Speed Assistant.....	521
<i>Jeremie Daniel, G. Pouly, Abderazik Birouche, Jean-Philippe Lauffenburger, Michel Basset</i>	
Author Index	