

13th IFAC Symposium on Control in Transportation Systems 2012

**Sofia, Bulgaria
12-14 September 2012**

Editor:

Todor Stoilov

ISBN: 978-1-62276-881-3

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© (2012) by Elsevier Limited
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact the publisher, Elsevier Limited
at the address below.

Elsevier Limited
The Boulevard, Langford Lane
Kidlington OX5 1GB, United Kingdom

Phone: +44 (0)1865 844640
Fax: +44 (0)1865 843912

Email: eurobkinfo@elsevier.com

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

| | |
|---|-----|
| Space-Independent Community Structure Detection in United States Air Transportation | 1 |
| <i>Emil Gegov, Alexander Gegov, M. Nadia Postorino, Mark Atherton, Fernand Gobet</i> | |
| METANET Model Validation Using a Genetic Algorithm | 7 |
| <i>Adam James Poole, Apostolos Kotsialos</i> | |
| Optimal Trajectory Planning for Trains under Operational Constraints Using Mixed Integer Linear Programming | 13 |
| <i>Yihui Wang, Bart De Schutter, Ton J. J. van den Boom, Bin Ning</i> | |
| Realistic Modelling of Train Control System with Coloured Petri Nets | 19 |
| <i>Daohua Wu, Eckehard Schmieder, Debiao Lu, Hansjorg Manz</i> | |
| Concurrent Split, Offset and Cycle Control through Model Predictive Control | 24 |
| <i>Luciano Dionisio Dantas, Bernhard Friedrich</i> | |
| Development of the Autonomous Overhead Travelling Crane with Real Time Path-Planning Based on Obstacle Information | 30 |
| <i>Akihiro Kaneshige, Shunsuke Nagai, Satoshi Ueki, Takanori Miyoshi, Kazuhiko Terashima</i> | |
| Geometric Path Planning for Automatic Parallel Parking in Tiny Spots | 36 |
| <i>Helene Vorobieva, Sebastien Glaser, Nicoleta Minoiu Enache, Said Mammar</i> | |
| Video-Based Parking Space Analysis for Traffic Management | 43 |
| <i>Klaus-Peter Doge, Jurgen Krimmling</i> | |
| Design and Analysis of a Fault Diagnosis System for Aircraft Control | 48 |
| <i>Ouadie Bennouna, Nicolas Langlois</i> | |
| Fault Detection in Roll Angle Estimation for Two-Wheeled Vehicles | 54 |
| <i>Simone Formentin, Ivo Boniolo, Paolo Lisanti, Cristiano Spelta, Sergio Savaresi</i> | |
| CRONE Control Application for a Toll Plaza | 60 |
| <i>Milka Uzunova, Daniel Jolly, Emil Nikolov</i> | |
| Network-Centric Simulation of Complex Transportation Systems Based on an Extended HLA Integration Architecture | 66 |
| <i>Georgi Kirov, Valentin Stoyanov, Boyan Lazarov</i> | |
| Modelling and H_∞ Control of Urban Transportation Network | 72 |
| <i>Huide Zhou, Rachid Bouyekhf, Abdellah El Moudni</i> | |
| Accuracy Evaluation of GNSS for a Precise Vehicle Control | 78 |
| <i>Federico Grasso Toro</i> | |
| A Discrete-Time Model for Optimizing the Rail Port Cycle | 83 |
| <i>Claudia Caballini, Cecilia Pasquale, Simona Sacone, Silvia Siri</i> | |
| Macroscopic Traffic Control of a Mixed Urban and Freeway Network | 89 |
| <i>Mohsen Ramezani, Jack Haddad, Nikolas Geroliminis</i> | |
| Micro-Ferry Scheduling Problem with Charging and Embarking Times | 95 |
| <i>Mernout Burger, Bart De Schutter, Hans Hellendoorn</i> | |
| Algebraic Connectivity Optimization of Large Scale and Directed Air Transportation Network | 103 |
| <i>Gregoire Spiers, Peng Wei, Dengfeng Sun</i> | |
| Integrated Ramp Metering and Mainstream Traffic Flow Control on Freeways Using Variable Speed Limits | 110 |
| <i>Rodrigo Castelan Carlson, Diamantis Manolis, Ioannis Papamichail, Markos Papageorgiou</i> | |
| Simulation of Natural Environment Impacts on Intelligent Vehicle Based on a Virtual Reality Platform | 116 |
| <i>Minzhi Luo, Abdelkader El Kamel, Guanghong Gong</i> | |
| Fuzzy Traffic Controller for Urban Intersection Developed in Simulink/Sim Events | 122 |
| <i>Zoran Gacovski, Stojce Deskovski, Kostandina Veljanovska</i> | |
| Safety Assesment of Mixed Traffic Based on Accident Scenario | 126 |
| <i>Oussama Derbel, Benjamin Mourllion, Michel Basset</i> | |
| Multi-Dimensional Nash Arbitration in the Braess Paradox | 132 |
| <i>Natalia Danailova Nikolova, Ivan Stefanov Armenski, Lea-Tereza Tenekedjjeva, Daniela Toneva-Zheynova</i> | |
| Expert Assessment of Alternatives to Change the Location of the Port of Varna | 138 |
| <i>Natalia Danailova Nikolova, Ivan Stefanov Armenski, Kalina Tchikova, Kiril Ivanov Tenekedjjev</i> | |
| Model Predictive Traffic Control: A Mixed-Logical Dynamic Approach Based on the Link Transmission Model | 144 |
| <i>Mohammadreza Hajiahmadi, Bart De Schutter, Hans Hellendoorn</i> | |

| | |
|--|-----|
| Green-Function for the Highway Vehicular Traffic Flow Modeling and Analysis | 150 |
| <i>Emil Nikolov, Nina Nikolova, Vassilka Stoilova</i> | |
| A Dynamic Traffic Assignment Measure of Stability Based on Network Efficiency | 158 |
| <i>Eleni Papatzikou, Antony Stathopoulos</i> | |
| Safety-Critical Interlocking Software Development Process for Fixed-Block Signalization Systems | 165 |
| <i>Mustafa Seckin Durmus, Ugur Yildirim, Oytun Eris, Mehmet Turan Soylemez</i> | |
| Automatic Interlocking Table Generation for Railway Stations Using Symbolic Algebra | 171 |
| <i>Ugur Yildirim, Mustafa Seckin Durmus, Mehmet Turan Soylemez</i> | |
| N-Version Programming for Railway Interlocking Systems: Synchronization and Voting Strategy | 177 |
| <i>Oytun Eris, Ugur Yildirim, Mustafa Seckin Durmus, Mehmet Turan Soylemez, Salman Kurtulan</i> | |
| The Relationship between Diagnostic Coverage and Proof Test Interval for 1oo2 and 1oo2D Architectures | 181 |
| <i>Ilker Ustoglu, Ozgur Turay Kaymakci, Josef Borcsok</i> | |
| Design of a Hardware and Software Based Test Bed for Railway Signalization Systems | 185 |
| <i>Ilhan Mutlu, Ali F. Ergenc, Tolga Ovatman, Mehmet Turan Soylemez</i> | |
| Interlocking and Automatic Operating System Design with Automaton Method | 191 |
| <i>Emre Dincel, Salman Kurtulan</i> | |
| Graph Constrained-CTM Observer Design for the Grenoble South Ring | 197 |
| <i>Carlos Canudas de Wit, Luis Ramon Leon Ojeda, Alain Kibangou</i> | |
| Solving Multi-Modal and Uni-Modal Transportation Problems through TIMIPlan | 203 |
| <i>Javier Garcia, Alvaro Torralba, Angel Garci-a-Olaya, Daniel Borrajo, Jose E. Florez</i> | |
| Associating Driving Behavior with Hysteretic Phenomena of Freeway Traffic Flow | 209 |
| <i>Foteini Orfanou, Eleni Vlahogianni, Matthew Karlaftis</i> | |
| A Model Predictive Control Approach for the Line Balancing in Baggage Handling Systems | 215 |
| <i>Yashar Zeinaly, Bart De Schutter, Hans Hellendoorn</i> | |
| Control of Traffic Signals in a Model Predictive Control Framework | 221 |
| <i>M.A.S. Kamal, Jun-ichi Imura, Akira Ohata, Tomohisa Hayakawa, Kazuyuki Aihara</i> | |
| Software Reliability Modelling of Risk Automotive System | 227 |
| <i>Nikolay Petrov, Angel Tanev</i> | |
| Bi-Level Modelling of Arterial Traffic Control | 231 |
| <i>Todor Stoilov, Krasimira Stoilova, Konstantin Nikolov</i> | |
| Achieving System-Optimal Splitting Rates in a Freeway Network Using a Reverse Stackelberg Approach | 237 |
| <i>Noortje Groot, Bart De Schutter, Hans Hellendoorn</i> | |
| Identification of an Engine Air Path Actuator with LuGre Friction Model | 243 |
| <i>Athmane Kebairi, Mohamed Becherif, Mohammed El Bagdouri, Maxime Wack</i> | |
| Monitoring Driver's Authority: Simulator Study | 249 |
| <i>Tankut Acarman</i> | |
| Hierarchical Planning for Agent-Based Traffic Management and Control | 256 |
| <i>Chao Lu, Haibo Chen</i> | |
| A Robust Sliding Mode Control Strategy for Turbocharged Diesel Engine Air Path | 262 |
| <i>Softiane Ahmed Ali, Nicolas Langlois</i> | |
| Analysis of Driver Behavior Related to Look-Ahead Control | 268 |
| <i>Andras Mihaly, Balazs Nemeth, Peter Gaspar</i> | |
| Optimization Problem of Assignment Containers to AIVs in a Container Terminal | 274 |
| <i>Radhia Zaghoud, Khaled mesghouni, Simon Collart Ditutelle, Kamel Zidi, Khaled Ghedira</i> | |
| The Application of an Intelligent Crane Control System | 280 |
| <i>Jaroslav Smoczek, Janusz Szpytko, Pawel Hyla</i> | |
| Automatic Ship Berthing Using Artificial Neural Network Based on Virtual Window Concept in Wind Condition | 286 |
| <i>Yaseen Adnan Ahmed, Kazuhiko Hasegawa</i> | |
| Economic and Social Modelling of Urban Traffic Controlling | 292 |
| <i>Adam Torok, Raimundas Junevicius, Ferenc Meszaros</i> | |
| Non-Integer Real-Time Robust Control with Application to Toll Plaza and Evaluation of CO2 Gases Emissions | 297 |
| <i>Milka Uzunova, Remi Losero, Jimmy Lauber, Emil Nikolov, Thierry Marie Guerra</i> | |
| A Model for Pedestrian Routing in Walkable Networks | 303 |
| <i>Olaf Czogalla</i> | |
| Traffic Flow Modelling Approach Based on the Controlled Networks | 309 |
| <i>Askhat Diveev, Andrew Kochkin, Konstantin Pupkov, Elena Sofronova</i> | |

| | |
|--|-----|
| Indoor Navigation and Guidance of an Autonomous Robot Vehicle with Static Obstacle Avoidance and Optimal Path Finding Algorithm | 315 |
| <i>Lutfi Mutlu, Erol Uyar</i> | |
| Stability Criterion for a Single Decision-Making Node in Decentralized Material Handling Systems | 320 |
| <i>Ireneus Rudolf Wior, Patrick Roth, Alexander Fay</i> | |
| Fault Tolerant Control for Autonomous Vehicle by Generating References for Rear Wheels Steering | 328 |
| <i>Alain Haddad, Abdel Aitouche, Vincent Cocquempot</i> | |
| Understanding Simulated Driver Behavior Using Hysteresis Loops | 334 |
| <i>Lancelot SIX, Sio-Song Ieng, Julien Saunier, Zahia Guessoum</i> | |
| In-Vehicle Embedded Control Systems for Safety: A Survey | 341 |
| <i>Mariana Netto</i> | |
| Simulation-Based Evaluation of New Freeway Isolated Ramp Metering | 347 |
| <i>Vesela Dryankova, Hassane Abouaissa, Daniel Jolly, Habib Haj-Salem, Emil Nikolov</i> | |
| Distributed Approach for Vehicle Routing Problem in Disaster Case | 353 |
| <i>Fethi Mguis, Kamel Zidi, Khaled Ghedira, Pierre Borne</i> | |
| Modelling Road Traffic Incident Management Problems for Automated Planning | 360 |
| <i>Mohammad Munshi Shahin Shah, T.L. McCluskey, Peter Gregory, Falilat Jimoh</i> | |
| Planning for Effective Bus Rapid Transit Systems: A Scenario Simulation Modelling Based Approach | 366 |
| <i>Athanasios Maimaris, George Papageorgiou, P. Ioannou, Thrasos Aphantinos</i> | |
| Author Index | |