

DTA2010

The Third International Symposium on Dynamic Traffic Assignment



29th – 31st July, 2010

Takayama Green Hotel, Takayama, Japan

Welcome Message

Welcome to DTA 2010 at Takayama, Japan - the third symposium in a series that started off in Leeds in 2006 and was continued in Leuven in 2008. These symposia provided a forum where groups of researchers, engaged in cutting-edge research, gathered from all over the world to intensively discuss / exchange recent research issues and outcomes on DTA (Dynamic Traffic Assignment) and to identify future directions for activities and development.

This symposium invites 2 keynote speeches by Professor Mike Smith and Professor Terry Friesz as well as 39 presentations dealing with aspects of a wide range from fundamental theoretical issues to promising applications of DTA, including two aspects of dynamics: within-day and day-to-day dynamics. We hope to have established a stimulating but informal and warm atmosphere, in which any topic related to DTA can be addressed, that aids to establish a worldwide network of researchers and generates opportunities of collaboration.

In addition to the proceedings, we are fortunate to offer the opportunities to publish your papers in the special issues of three international journals with high reputation. Details will be announced during the symposium by the guest editors. It is envisaged that discussions during the symposium will help to further improve your paper.

We wish you a pleasant stay in Takayama, a famous town with the flair of historical Japan, and hope you enjoy fruitful discussion and a lasting experience. Thank you very much for joining us!



Masao KUWAHARA, Professor

Symposium Chair of DTA2010
Institute of Industrial Science, University of Tokyo
Graduate School of Information Science, Tohoku University

Abstracts of Keynote Speeches

Day to Day and within Day Traffic Assignment and Control Processes; with Implications for the Design of Intelligent Network Management and Control Strategies

Professor Mike Smith

Department of Mathematics, University of York

This paper outlines

- how the dynamics of interconnecting markets has been modelled in economics and how the stability of these dynamics may or may not depend on the different adjustment speeds in different markets;
- how day to day traffic adjustments have been modelled;
- how within day traffic adjustments have been modelled (including departure time choice);
- how these adjustments may be regarded as adjustments in different but interconnected markets; and
- possible ways in which past work in economic theory on the stability of interconnecting markets may point to new methods of looking at the dynamics of day to day and within day adjustment processes.

How responsive signal timings fit into these adjustment processes is explored, and the stability of natural adjustment processes, including both flow and control adjustments, is considered. This leads to

- a new way of designing controls for urban road networks and
- a new approach to the bilevel optimal control problem.

The paper makes some suggestions, based on the theory and modelling presented, as to how best to manage and control urban road networks.

The paper also considers routing algorithms utilised in communication networks and in particular includes a new look at familiar ways of calculating network equilibria using link flows and splitting rates instead of route flows.

Dynamic Traffic Assignment: Some History, Unanswered Questions and New Directions

Professor Terry L. Friesz

Harold & Inge Marcus Chaired Professor of Industrial Engineering, Pennsylvania State University

In this talk we present a condensed history of the field of scholarly inquiry known as dynamic traffic assignment, emphasizing contributions during the early years that continue to influence present-day DTA research. This review includes a short list of unanswered, seemingly intractable research questions. We also offer some frank criticisms of the basic notion of dynamic user equilibrium that is employed in many studies of dynamic traffic assignment and argue that the stage is now set for the emergence of a new fundamental DUE model. We offer some conjectures about what a new, computable theory of dynamic traffic assignment informed by an improved DUE model may look like and suggest some specific directions of inquiry.

Programme: 29th July

Time	Title	Authors
8:45-8:55	Opening Remark	
	Session 1 : DUE and Other Assignment Models (1) chaired by S. C. Wong	
8:55-9:45	A General Methodology and a Free Software for the Calibration of DTA Models	Gunnar Flötteröd
	Dynamic Origin-Destination Estimation in Congested Networks	Rodric Frederix Chris M.J. Tampère Francesco Viti
9:45-10:05	Coffee Break	
	Session 2 : DUE and Other Assignment Models (2) chaired by T. Iryo	
	Punctuality-Based Dynamic Travel Choice Modeling	Barbara W.Y. Siu Hong K. Lo
10:05-11:45	Reliability-Based Departure Time User Equilibrium	Hao Li Michiel Bliemer Huizhao Tu
	Computing Dynamic User Equilibria with Alternative Network Loading Models	Terry L. Friesz Taeil Kim Ilsoo Lee
	A Semi-Dynamic Traffic Assignment Model with Flow Propagation Based on Sensitivity Analysis	Sho-ichiro Nakayama
11:45-13:00	Conference Lunch	
	Session 3 : DUE and Other Assignment Models (3) chaired by H. K. Lo	
13:00-13:50	Staggered Work Hours: a Bi-Level Model and the Role of Incentives	Wilfredo F. Yushimito Xuegang (Jeff) Ban Jose Holguín-Veras
	Integrating Aspects of Unreliability in a Schedule-Based Transit Assignment Model	Normen Rochau Klaus Noekel Michael G. H. Bell
13:50-14:50	Keynote Speech : chaired by M. Kuwahara Professor Mike Smith: Day to Day and within Day Traffic Assignment and Control Processes; with Implications for the Design of Intelligent Network Management and Control Strategies	
14:50-15:15	Coffee Break	
	Session 4 : Optimization, Controlling and ITS (1) chaired by W. H. K. Lam	
15:15-16:30	Dynamic Traffic Equilibrium Model for Dynamic Pricing and Road Capacity Allocation Scheme	Renxin Zhong Agachai Sumalee Takuya Maruyama Paramet Luatthep
	Verification of the Area Ramp Metering Control Strategy Using Macroscopic Fundamental Diagram	Toshio Yoshii Kosuke Endo
	Implementation of Optimized Traffic Assignment in Disaster Relief: the Effectiveness of Evacuation Instructions and Blocking Roads	Olga Huibregtse Andreas Hegyi Serge Hoogendoorn
16:30-17:00	Coffee Break	
	Session 5 : Optimization, Controlling and ITS (2) chaired by T. Yoshii	
17:00-17:50	Discriminated Discounts Based on ETC to Improve Highway Bottleneck Congestion	Takaji Suzuki
	Online Dynamic Traffic Assignment for Predictive Traffic Management through Information Supply and Pricing	Jing Dong Hani S. Mahmassani
19:00	Reception & Buffet Dinner	

Programme: 30th July

Time	Title	Authors
8:30-10:00	Free time for visiting the morning market & town Session 6 : Route Choices chaired by S. Nakayama	
10:30-11:45	Formulation of a Risk-Averse Dynamic Traffic Assignment	Solmaz Haji Hosseinloo Michael G. H. Bell
	Dynamic Equilibrium Assignment Convergence by En-Route Flow Smoothing	Adam J. Pel Michiel C.J. Bliemer Serge P. Hoogendoorn
	Selecting Potentially Optimal Routes through Optimistic and Pessimistic Node Potentials	Achille Fonzone Jan-Dirk Schmöcker Michael G. H. Bell
11:45-13:00	Conference Lunch Session 7 : Loading Models (1) chaired by A. Sumalee	
13:00-14:40	Empirical Macroscopic Evaluation of Freeway Merge-Ratios	Hillel Bar-Gera Soyoung Ahn
	Isolated Signalized Intersections in Dynamic Traffic Assignment	Michal Blumberg Nitzani Hillel Bar-Gera Ilya Gertsbakh
	A Differentiable Dynamic Network Loading Model That Yields Queue Length Distributions and Accounts for Spillback	Carolina Osorio Gunnar Flötteröd Michel Bierlaire
	Implementation of a Single Dynamic Traffic Assignment Model on Mixed Urban and Highway Transport Networks Including Junction Modelling	M. P. H. Raadsen H. E. Mein M. P. Schilpzand F. Brandt
14:40-15:10	Coffee Break Session 8 : Loading Models (2) chaired by D. P. Watling	
15:10-16:50	Dynamic Continuum Modeling Approach to Urban Traffic Equilibrium Problems	Yanqun Jiang S.C. Wong H.W. Ho Peng Zhang Runxun Liu Agachai Sumalee
	On Two Stable States of Time-Varying Traffic Flow on Signalised Networks	Y. E. Ge Xizhao Zhou
	Stochastic Cell Transmission Model for Traffic Network with Demand and Supply Uncertainties	Agachai Sumalee Renxin Zhong Tianlu Pan Takamasa Iryo William H.K. Lam
	The Stochastic Cell Transmission Model Considering Spatial and Temporal Correlations for Traffic States Prediction	Tianlu Pan Agachai Sumalee Renxin Zhong Nobuhiro Uno
16:50-17:10	Coffee Break Session 9 : Loading Models (3) chaired by C. Tampère	
17:10-18:25	Network Performance Degeneration in Dynamic Network Loading Models	Wouter Schakel Olga Huijbregtse Serge Hoogendoorn
	Introducing Lanes and Lane-Changing in a Cell-Transmission Model	Chandra Balijepalli Malachy Carey David Watling
	A Graph Theoretical Combinatorial Algorithm and Dual Approximation Scheme for Large-Scale Dynamic Traffic Assignment Calibration Problems	Steven T. Waller R. Kumar N. Nezamuddin
19:00	Conference Dinner	

Programme: 31st July

Time	Title	Authors
	Session 10 : The Day of Day-to-day Models (1) chaired by F. Kurauchi	
	Modeling the Day-to-Day Traffic Evolution Process after an Unexpected Network Disruption	Xiaozheng He Henry X. Liu
8:35-9:50	An Experimental Study of Effects of Travel Time Distribution Information on Dynamic Route Choice Behavior	Mitsuhiro Tanaka Nobuhiro Uno Yasuhiro Shiomi YoongHo Ahn
	An Evolutionary Approach to Dynamic Traffic Congestion Control: Implementing Tradable Network Permits Based on Combinatorial Auction	Kentaro Wada Takashi Akamatsu
9:50-10:20	Coffee Break	
	Session 11 : The Day of Day-to-day Models (2) chaired by G. E. Cantarella	
	Evaluating Network Performance Using Different Dynamic Traffic Models within a DTA Framework	Isaak Yperman M. Snelder
	Detector Placement Optimisation Based on DTA and Empirical Data	Tian Jiang Marc Miska Masao Kuwahara
10:20-12:00	Dynamic Route Choice Adjustment Process Using the Log Files of Car Navigation Systems	Seungjae Lee Sooil Lee Hyeokjun Son Injoon Choi
	Comparing the Transient Dynamics and Equilibria of Perturbed Networks with Differing Structural Properties	John Armstrong Richard Connors David Watling
12:00-13:15	Conference Lunch	
	Session 12 : The Day of Day-to-day Models (3) chaired by M. Kuwahara	
	Signal Setting with Demand Assignment: Global Optimization with Equilibrium Stability Constraints	Giulio E. Cantarella P. Velonà A. Vietta
	Discretised Vehicle Assignment: Characteristics of Equilibrium Solutions and Evolution Processes	Takamasa Iryo
13:15-15:20	Dynamic Process Models for Long-Range Transport Planning	David Watling Mike Smith
	The Long Term Behaviour of Day-to-Day Traffic Assignment Models	Martin L. Hazelton Hong K. Lo Giulio E. Cantarella David Watling
	Dynamic Traffic Assignment under Equilibrium and Non-equilibrium: Do We Need a Paradigm Shift?	Chris M.J. Tampère Francesco Viti
15:20-16:00	Coffee Break	
	Keynote Speech : chaired by T. Iryo	
16:00-17:00	Professor Terry L. Friesz: Dynamic Traffic Assignment: Some History, Unanswered Questions and New Directions	
17:00-17:20	Closing Remark	

Committee Members

Members of International Scientific Advisory Committee

David Watling	University of Leeds	<i>Organizer of 1st DTA symposium in 2006</i>
Chris Tampère	Katholieke Universiteit Leuven	<i>Organizer of 2nd DTA symposium in 2008</i>
Michiel Bliemer	Delft University of Technology	
David Boyce	Northwestern University	
Giulio Erberto Cantarella	University of Salerno	
Malachy Carey	Queen's University Belfast	
Terry Friesz	Pennsylvania State University	
Benjamin Heydecker	University College London	
Masao Kuwahara	University of Tokyo / Tohoku University	
Hong K. Lo	Hong Kong University of Science and Technology	
Srinivas Peeta	Purdue University	
Mike Smith	University of York	

Honorary Member

Piet Bovy	Delft University of Technology
-----------	--------------------------------

Members of Regional Committee

Masao Kuwahara	University of Tokyo / Tohoku University	<i>Committee Chair / Local Organizing Team</i>
Takashi Akamatsu	Tohoku University	
Yasuo Asakura	Kobe University	
Motohiro Fujita	Nagoya Institute of Technology	
William H. K. Lam	Hong Kong Polytechnic University	
Takuya Maruyama	Kumamoto University	
Yukimasa Matsumoto	Meijo University	
Shoshi Mizokami	Kumamoto University	
Se-il Mun	Kyoto University	
Agachai Sumalee	Hong Kong Polytechnic University	
Jun-ichi Takayama	Kanazawa University	
Ken-etsu Uchida	Hokkaido University	
S. C. Wong	University of Hong Kong	
Toshio Yoshii	Kyoto University	
Fumitaka Kurauchi	Gifu University	<i>Local Organizing Team</i>
Shoichiro Nakayama	Kanazawa University	<i>Local Organizing Team</i>
Takamasa Iryo	Kobe University	<i>Local Organizing Team</i>

Acknowledgements

The local organizing team wish to extend our appreciation to Ms Kiyoko Morimoto, Ms Chikako Komori, and Ms Guo Min, who support the operation of the symposium. This symposium is financially supported by the Foundation for the Promotion of Industrial Science and Takayama City.

Thank you for joining us!
DTA2010 Local Organizing Team