Curriculum Vitae

(March 27, 2005)

Apostolos Kotsialos

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Vita

Birth:	Larissa, Greece 31 January 1972.
Family:	Single.
Citizenship:	Greek.

Education

1989 – 1995	Engineering degree studies at the Department of Production Engineering and Management (DPEM) at the Technical University of Crete (TU Crete).
1992	ERASMUS fellowship for visiting the Technical University of Eindhoven, The Netherlands.
1995	Diploma thesis "Automatic Highway Systems: overview and preliminary simulation".
1995 – 1998	Interdisciplinary Master's degree studies at DPEM, TU Crete.
1998	Master thesis "Integrated control of motorway traffic networks".
1998 – 2004	Ph.D. Candidate at DPEM, TU Crete.
2004	Ph.D. Thesis "Traffic Flow Modelling and Optimal Control of Large-Scale Motorway Networks".

Languages

Greek.
English (Fluently).

Employment

1995 – 2004	Research Associate at the Dynamic Systems and Simulation Laboratory, DPEM, TU Crete.

| 2004 – present | Postdoc researcher at the Dynamic Systems and Simulation Laboratory, DPEM, TU Crete. |
| 2004 – present | Contract lecturer at DPEM, TU Crete. |

Military Obligations

Mandatory military service at the Hellenic Armed Forces completed during the period 2001–2002.

Teaching activities

- Tutorials for the courses:
    - Nonlinear programming.
    - Dynamic programming.
- Teaching of full courses:
    - Systems' Reliability (winter semester of 2004).
    - Production Systems (summer semester of 2005).

Professional Memberships

- Member of the Greek Technical Chamber (TEE).
- Member of the IEEE.

Research Activities

Participation in the following research projects:

- **DACCORD** (TR1017) of the European Commission (DG XIII - Transport Telematics).

  Scope: Coordinated Dynamic Traffic Management with Applications to the Ile-de-France Network, the Ville de Paris Network, the Amsterdam Periurban Network, and the Venice-Padua Motorway.

  Duration: 1996 – 1999.
- **DELPHI** (26965) of the European Commission (DG III - ESPRIT).

  Scope: Integration in Manufacturing with sales forecasting.

  Duration: 1998 – 2000.
- **OMNI** (IST-1999-11250) of the European Commission (DG XIII), R&D Programme Information Society Technologies.

  Scope: Integrated architecture for urban traffic control and development of an Internet information system with implementation in Milano, Paris, Alicante and Chania.

  Duration: 2000 – 2003.
- **SMART NETS** (IST-2000-28090) of the European Commission (DG XIII), R&D Programme Information Society Technologies.

  Scope: Implementation and Field-Evaluation of the Urban Traffic Control Strategy TUC in Southampton (U.K.), Munich (Germany) and Chania (Greece).

  Duration: 2001 – 2003.

- **RHYTHM** (IST-2000-29427) of the European Commission (DG XIII), R&D Programme Information Society Technologies.
  Scope: Motorway Traffic Surveillance and Control Employing Video Sensor Technology.
  Duration: 2001 – 2004.
- **EURAMP** of the European Commission (IST-2002-23110)
  Scope: European Ramp Metering Project European Ramp Metering Project at a number of different sites (France, The Netherlands, Germany, Israel and the UK).
  Duration: 2004 – 2007

Research Interests
- Traffic flow modeling.
- Traffic flow control.
- Numerical optimization.
- Automatic control.
- Optimal control.
- Receding horizon control.
- Neural networks.
- Forecasting.

Publications

A. Papers in refereed journals

A1. A. Kotsialos and M. Papageorgiou, "The importance of traffic flow modelling for motorway traffic control," *Networks and Spatial Economics*, Vol. 1, pp. 179–203, 2000.

A2. A. Kotsialos, M. Papageorgiou and F. Middelham, "Optimal coordinated ramp metering with AMOC," *Transportation Research Record*, No. 1748, pp. 55–65, 2001.

A3. A. Kotsialos, M. Papageorgiou and A. Poulimenos, "Long term sales forecasting for industrial supply chain management," *Operational Research. An international Journal*, Vol. 1, No. 3, pp. 241–251, 2001.

A4. A. Kotsialos, M. Papageorgiou, M. Mangeas and H. Haj-Salem, "Coordinated and integrated control of motorway networks via non-linear optimal control," *Transportation Research C*, Vol. 10, No. 1, pp. 65–84, 2002.

A5. M. Papageorgiou and A. Kotsialos "Freeway ramp metering: An overview," *IEEE Transactions on Intelligent Transportation Systems*, Vol. 3, No. 4, pp. 271–281, 2002.

A6. A. Kotsialos, M. Papageorgiou, C. Diakaki, Y. Pavlis and F. Middelham, "Traffic flow modeling of large-scale motorway networks using the macroscopic modeling tool METANET," *IEEE Transactions on Intelligent Transportation Systems*, Vol. 3, No. 4, pp. 282–292, 2002.

A7. A. Kotsialos and M. Papageorgiou, "Motorway network traffic control systems," *European Journal of Operational Research*, Vol. 152, No. 2, pp. 321–333, 2004.

A8. M. Papageorgiou, C. Diakaki, V. Dinopoulou, A. Kotsialos and Y. Wang, "Review of road traffic control strategies," *Proceedings of the IEEE*, Vol. 91, No. 12, pp. 2043–2067, 2003.

A9. A. Kotsialos and M. Papageorgiou, "Efficiency and equity properties of freeway network–wide ramp metering with AMOC," *Transportation Research C*, Vol. 12, No. 6, pp. 401–420, 2004.

A10. A. Kotsialos and M. Papageorgiou, "Nonlinear optimal control applied to coordinated ramp metering," *IEEE Transactions on Control Systems Technology*, Vol. 10, No. 6, pp. 920–933, November 2004.

A11. A. Kotsialos, M. Papageorgiou and A. Poulimenos, "Long-term sales forecasting using Holt-Winters and Neural Networks Methods", *Journal of Forecasting*, accepted for publication.

A12. A. Kotsialos, M. Papageorgiou and F. Middelham, "Local and Optimal Coordinated Ramp Metering for Freeway Networks". (At final review stage for *ITS Journal*).

B. Book chapters

B1. ITS and Traffic Management. One of the chapters of Operations Research Handbook on Transportation. Co-authored with M. Papageorgiou, J. Bottom, M. Ben Akiva, S. Hogendoorn, P. Bovy, M. McDonald, and N. Hounsell.In preparation.

B2. A. Kotsialos and M. Papageorgiou, "The Traffic Amelioration Potential of Freeway Network Ramp Metering Control", paper to be included in a special volume in honor of Prof. Pravin Varaiya's, Univ. of California, Berkeley, 65th birthday.

C. Conference papers

C1. A.Kotsialos, Y. Pavlis, F. Middelham, M. Papageorgiou and C. Diakaki, "METANET application and validation for the large scale motorway

network around Amsterdam," in *Proc. (CD) 4th World Congress on Intelligent Transportation Systems*, Berlin, Germany, October 21–24, 1997

C2. A. Kotsialos, C. Diakaki, Y. Pavlis, M. Papageorgiou and G. Vardaka, "Short-term traffic forecasting using the macroscopic simulation tool METANET," in *Proc. DACCORD Short Term Traffic Forecasting Workshop*, Delft University of Technology, Delft, The Netherlands, February 13, 1998, pp. 11–30.

C3. A. Kotsialos, H. Haj-Salem, F. Middelham, J. van Schuppen and J. Taylor, "DACCORD integrated and co-ordinated control," in *8th World Conference on Transport Research*, Antwerp, Belgium, July 12–17, 1998.

C4. A. Kotsialos, Y. Pavlis, C. Diakaki, G. Vardaka and M. Papageorgiou, "Modelling of the large scale motorway network around Amsterdam," in *Preprints 8th IFAC/IFORS/IMACS/IFIP Symposium on Large Scale Systems Theory & Applications*, Patras, Greece, July 15–17, 1998, pp. 354–360.

C5. A. Kotsialos, M. Papageorgiou and A. Messmer, "AMOC: A generic tool for integrated control of motorway traffic networks," in *DACCORD Workshop on Advanced Motorway Traffic Control*, Lancaster University, United Kingdom, December 11, 1998, pp. 34–45.

C6. A. Kotsialos, M. Papageorgiou and A. Messmer, "Optimal co-ordinated and integrated motorway network traffic control," in *Proc. TRAIL Expert Seminar on Recent Advances in Traffic Flow Modelling and Control*, Delft, The Netherlands, 20 September 1999, Chapter 2.

C7. A. Kotsialos, M. Papageorgiou, C. Diakaki, Y. Pavlis and F. Middelham, "Traffic flow modelling of large-scale motorway networks using the macroscopic modelling tool METANET," in *Proc. TRAIL Expert Seminar on Recent Advances in Traffic Flow Modelling and Control*, Delft, The Netherlands, 20 September 1999, Chapter 6.

C8. A. Kotsialos, M. Papageorgiou and A. Messmer, "Integrated optimal control of motorway traffic networks," in *Proc. 1999 American Control Conference*, San Diego, California, USA, June 2–4, 1999, pp. 2183–2187.

C9. A. Kotsialos, M. Papageorgiou and A. Messmer, "Optimal co-ordinated and integrated motorway network traffic control," in *Proc. 14th Intern. Symposium on Transportation and Traffic Theory* (Elsevier Science), Jerusalem, Israel, 20–23 July 1999, pp. 621–644.

C10. A. Kotsialos and M. Papageorgiou, "Nonlinear optimal control applied to coordinated ramp metering," in *Preprints 11th IFAC Workshop on Control Applications of Optimization*, Saint-Petersburg, Russia, July 3–6, 2000, Vol. 1, pp. 190–195.

C11. M. Papageorgiou and A. Kotsialos, "Freeway ramp metering: An overview," in *Proc. 3rd IEEE Intern. Conference on Intelligent Transportation Systems*, Dearborn, Michigan, October 1–3, 2000, pp. 228–239.

C12. A. Kotsialos, M. Papageorgiou and F. Middelham, "Optimal coordinated ramp metering with AMOC," in *Preprints CD-ROM of the TRB (Transportation Research Board) 80th Annual Meeting*, Washington, D.C., January 7–11, 2001, Paper No. 01–3125.

C13. A. Kotsialos and M. Papageorgiou, "Nonlinear optimal control applied to coordinated ramp metering in the Amsterdam ringroad," in *Preprints 9th IFAC/IFORS/IMACS/IFIP Symposium on Large Scale Systems Theory and Applications*, Bucharest, Romania, July 18–20, 2001, pp. 472–477.

C14. A. Kotsialos and M. Papageorgiou, "Efficiency versus fairness in network-wide ramp metering," in *Proc. 4th IEEE Conference on Intelligent Transportation Systems*, Oakland, California, August 25–29, 2001, pp. 1190–1195.

C15. A. Kotsialos and M. Papageorgiou, "Overview of motorway network traffic control strategies," in *Proc. of the 13th Mini-EURO Conference on Handling Uncertainty in the Analysis of Traffic and Transportation Systems and the 9th Meeting of the EURO Working Group on Transportation*, Bari, Italy, June 10–13, 2002, pp. 381–386.

C16. A. Kotsialos and M. Papageorgiou, "Hierarchical nonlinear model predictive ramp metering control for freeway networks," *TRISTAN V (Triennial Symposium on Transportation Analysis)*, June 13-18, 2004, Le Gosier, Guadeloupe.

C17. A. Kotsialos and M. Papageorgiou, "Holt-Winters and Neural-Network Methods for Medium-term Sales Forecasting". (Accepted for publication at the *16th IFAC World Congress*, 2005).

C18. A. Kotsialos and M. Papageorgiou, "A Hierarchical Ramp Metering Control Scheme for Freeway Networks". (Accepted for publication at the *American Control Conference*, 2005).

D. Technical reports

D1. A. Kotsialos, M. Papageorgiou and partners of the Transport Telematics Project DACCORD (TR 1017), Coordinated Control Strategies, Deliverable 6.1, Report for Transport Telematics Office, Brussels, Belgium, December 1997.

D2. A. Kotsialos, M. Papageorgiou A. Messmer, and partners of the Transport Telematics Project DACCORD (TR 1017), Coordinated Control Software, Deliverable 6.2, Report for Transport Telematics Office, Brussels, Belgium August 1998.

D3. A. Kotsialos, M. Papageorgiou and partners of the Transport Telematics Project DACCORD (TR 1017), Off-Line Simulation Results, Deliverable 6.3, Report for Transport Telematics Office, Brussels, Belgium, August 1998.

D4. M. Papageorgiou, A. Kotsialos and partners of the Transport Telematics Project DACCORD (TR 1017), Exploitation Plan, Deliverable 11.2, Report for Transport Telematics Office, Brussels, Belgium, December 1998.

D5. A. Poulimenos, M. Papageorgiou and A. Kotsialos, Functional Specifications of the Prediction Module, Deliverable 3.1.1 of the project DELPHI (26965), European Programme ESPRIT, Brussels, Belgium, May 1999.

D6. A. Poulimenos, M. Papageorgiou and A. Kotsialos, Methodological Design of the Prediction Module, Deliverable 3.2.1 of the project DELPHI (26965), European Programme ESPRIT, Brussels, Belgium, July 1999.

D7. A. Poulimenos, M. Papageorgiou, A. Kotsialos and J. Marinakis, Calibration and Verification of Prediction Parameters, Deliverable 3.3.1 of the project DELPHI (26965), European Programme ESPRIT, Brussels, Belgium, February 2000.

D8. A. Poulimenos, M. Papageorgiou, A. Kotsialos and J. Marinakis, Comparison and Evaluation Results for Prediction Module, Deliverable 3.4.1 of the project DELPHI (26965), European Programme ESPRIT, Brussels, Belgium, October 2000.

D9. P. Karampyperis, M. Papageorgiou and A. Kotsialos, Software Code of Statistical Forecasting Methods, Deliverable 3.2.3 of the project DELPHI (26965), European Programme ESPRIT, Brussels, Belgium, October 2000.

D10. A. Kotsialos, M. Papageorgiou and Partners, Current Status of Ramp Metering, Deliverable D2.2 of the project EURAMP (IST-2002-23110), European Programme IST, December 2004.

D11. A. Kotsialos and M. Papageorgiou, The Impact of the Number of Release Rates on ALINEA Ramp Metering Performance, Dynamic Systems and Simulation Laboratory Internal Report No 2004-23, Technical University of Crete, Chania, Greece.

D12. M. Papageorgiou, A. Kotsialos and Partners, Preliminary Local Strategy Development, Deliverable D3.1 of the project EURAMP (IST-2002-23110), European Programme IST.In preparation.

Presentations

1. Modelling and integrated control of the Amsterdam motorway network (in greek). Research Workshop of the Dynamic Systems and Simulation Labora-tory of the Technical University of Crete, Chania, Greece, April 10, 1997.
2. METANET application and validation for the large scale motorway network around Amsterdam. 4th World Congress on Intelligent Transportation Sys-tems, Berlin, Germany, October 21-24, 1997.
3. Short term traffic forecasting using the macroscopic simulation tool METANET. DACCORD Workshop on Short Term Traffic Forecasting, Delft, The Netherlands, February 13, 1998.
4. AMOC: A generic tool for integrated control of motorway traffic networks. DACCORD Workshop on Advanced Motorway Traffic Control, Lancaster University, United Kingdom, December 11, 1998.
5. DACCORD integrated and co-ordinated control. 8th World Conference on Transport Research, Antwerp, Belgium, July 12-17, 1998.
6. Integrated optimal control of motorway traffic networks. 1999 American Control Conference, San Diego, California, June 2-4, 1999.
7. Optimal co-ordinated and integrated motorway network traffic control. 14th Intern. Symposium on Transportation and Traffic Theory, Jerusalem, Israel, July 20-23, 1999.
8. Application of the OMNI model to the Chania site. 2nd OMNI Workshop, Alicante, Spain, 25 February 2003.

9.   Application of the OMNI model to the Chania site. Presentation at the City Council of Chania, Chania, Greece, 13 March 2003.

Refereeing

Journals:
- Transportation Research C.
- European Journal of Operational Research.
- IEEE Transactions on Control Systems Technology.

Conferences:
- WCTR (World Conference on Transport Research).
- IFAC (International Federation of Automatic Control) World Congress.
- IEEE Conference on Decision and Control.
- Transportation Research Board.
- IEEE Mediterranean Conference on Control and Automation.
- IEEE Conference on Control Applications.

Citations

There are 38 citations at my published work:

Paper A4 is cited in: [1], [2], [10], [13], [14], [21], [22].
Paper A5 is cited in: [7], [10], [11], [12], [22].
Paper A6 is cited in: [6].
Paper A8 is cited in: [9].
Paper C2 is cited in: [15].
Paper C7 is cited in: [16], [22].
Paper C8 is cited in: [21], [22].
Paper C9 is cited in: [8], [19], [21], [22], [23], [24], [25].
Paper C11 is cited in: [3], [13], [17], [20].
Paper C12 is cited in: [4], [5], [22].
Paper C14 is cited in: [1], [12].
Report D1 is cited in: [8], [21], [22].

[1]   L. Zhang L and D. Levinson, "Optimal freeway ramp control without origin-destination information," *Transportation Research B*, Vol. 38, No. 10, pp. 869 – 887, 2004.
[2]   M. Herty and A. Klar, "Simplified dynamics and optimization of large scale traffic networks," *Mathematical Models & Methods in Applied Sciences*, Vol. 14, No. 4, pp. 579 – 601, 2004.
[3]   M. Cassidy, "Freeway On-Ramp Metering, Delay Savings and the Diverge Bottleneck," *Intelimotion*, Vol. 10, No. 3, 2003.

[4]   A. Hegyi, B. De Schutter, H. Hellendoorn, and T. van den Boom, "Optimal coordination of ramp metering and variable speed control - An MPC approach," in *Proc. of the 2002 American Control Conference*, Anchorage, Alaska, pp. 3600 – 3605, May 2002.

[5]   A. Hegyi, B. De Schutter, and H. Hellendoorn, "Model predictive control for optimal coordination of ramp metering and variable speed control," in *Proc. of the 1st European Symposium on Intelligent Technologies, Hybrid Systems and their implementation on Smart Adaptive Systems (EUNITE 2001)*, Tenerife, Spain, pp. 260 – 272, Dec. 2001.

[6]   L. Mihaylova and R. Boel, "Hybrid stochastic framework for freeway traffic flow modeling", in *Proc. of the 1st international symposium on Information and communication technologies*, pp. 372 – 377, 2003.

[7]   M. Cassidy and S. Ahn, "Driver Turn-Taking Behavior in Congested Freeway Merges," in *Transportation Research Board Annual Meeting*, Washington, DC, 2005.

[8]   K. Bogenberger, H. Keller, and S. Ritchie, "Adaptive fuzzy systems for traffic responsive and coordinated ramp metering," in *Transportation Research Board Annual Meeting*, Washington, DC, 2002.

[9]   F. Basile, C. Carbone, P. Chiacchio, R. K. Boel, and C. C. Avram, "A hybrid model for urban traffic control," in *Proc. of the IEEE SMC'04*, October 10-13, The Hague, The Netherlands, 2004.

[10]   G. Gomes and R. Horowitz, "Globally Optimal Solutions to the On-ramp Metering Problem - Part I," in *Proc. of the 7th International IEEE Conference on Intelligent Transportation Systems,* 2004.

[11]   G. Gomes and R. Horowitz, "A study of two on-ramp metering schemes for congested freeways," in *Proc. of the 2003 American Control Conference*, Denver Colorado. pp. 3756 – 3761, June 4-6, 2003.

[12]   M. Cassidy and J. Rudjanakanoknad, "Increasing the Capacity of an Isolated Merge by Metering its On-Ramp," University of California, Berkeley Report UCB-ITS-RR-2004-6, 2004.

[13]   M. van den Berg, T. Bellemans, B. De Schutter, and H. Hellendoorn), "Control of traffic with anticipative ramp metering," in *Transportation Research Board Annual Meeting*, Washington DC, 2005.

[14]   M. van den Berg, B. De Schutter, A. Hegyi, H. Hellendoorn, "Model Predictive Control for Mixed Urban and Freeway Networks," in *Preprint CD Transportation Research Board Annual Meeting*, Washington, DC, 2004.

[15]   S.P. Hoogendoorn, P.H.L. Bovy and H. van Lint, "Short-term prediction of Traffic Flow Conditions in a Multilane Multi-class Network," in Michael A.P. Taylor, (Ed.), *Transportation and traffic theory in the 21st century* , pp. 625 – 651, Oxford: Pergamon, Elsevier Science, 2002.

[16] Ngoduy, D. and S.P. Hoogendoorn, "An Automated Calibration Procedure for Macroscopic Traffic Flow Models," in *Proc. of the 10th Symposium on Control in Transportation Systems*, 2003.

[17] M. Cassidy, "Freeway On-Ramp Metering, Delay Savings and the Diverge Bottleneck," in *Transportation Research Board Annual Meeting*, Washington DC, 2003.

[18] L. Zhang and D. Levinson, "Balancing Efficiency and Equity of Ramp Meters," in *Transportation Research Board Annual Meeting*, Washington DC, 2003.

[19] S.P. Hoogendoorn and P.H.L. Bovy, "State-of-the-art of Vehicular Traffic Flow Modelling," *Journal of Systems and Control Engineering* (Special Issue on Road Traffic Modelling and Control), Vol. 215, No. 4, pp. 283 – 304, 2001.

[20] C. Chen, J. Zhanfeng and P. Varaiya, "Causes and cures of highway congestion," *IEEE Control Systems Magazine*, Vol. 21 , Issue 6, pp. 26 – 32 , Dec. 2001

[21] T. Bellemans, *Traffic control on motorways*, PhD thesis, Katholieke Universiteit Leuven, Leuven, Belgium, May 2003.

[22] A. Hegyi, *Model Predictive Control for Integrating Traffic Control Measures*, PhD thesis, Delft University of Technology, Delft, The Netherlands, 2004.

[23] A. Hegyi, D.N. Duy, B. De Schutter, J. Hellendoorn, S.P. Hoogendoorn and S. Stramigioli, "Suppressing shock waves on the A1 in The Netherlands-model calibration and model-based predictive control," in *Proc. of the 2003 IEEE Intelligent Transportation Systems Conference*, Vol. 1 , pp. 672 – 677, Oct. 12-15 2003.

[24] T. Bellemans, B. De Sutter and B. De Moor, "Models for traffic control," *Journal A*, Vol. 43, No. 3-4, pp. 13 – 22, 2002.

[25] T. Bellemans, B. De Sutter and B. De Moor, "Model predictive control with repeated model fitting for ramp metering," in *Proc. of the 5th IEEE Intelligent Transportation Systems Conference*, Singapore, 2002.