

Lidia Montero

Doctor in Computer Science by Barcelona Tech - UPC Universitat Politècnica de Catalunya de Barcelona (1993), since 1998 is associate professor (tenure position) of the department of Statistics and Operations Research at the Technical University of Catalonia (UPC), **specializes in the application of statistics to transportation planning, demand modeling, traffic management, traffic simulation and other related transportation problems.**

In 1985 enrolled up to LIOS (Laboratori d'Investigació Operativa i Simulació) that in 1997 merged with other research groups at UPC to set up PROMALS (Programació Matemàtica, Logística i Simulació), a consolidated research group certified by the Catalan Government. PROMALS is a Transportation Research Laboratory at the Department of Statistics and Operations Research of UPC, very active in developing traffic models and namely traffic simulation models through the participation as partner in projects of the R&D Programs of the European Union.

Participation in the following projects:

1989-1991 DRIVE I Programme

- Project ASTERIX, System and Scenario Simulation for testing RTI Systems. The basic objective of this project was to design and develop an integrated modeling framework for a traffic simulation system suitable for testing Advanced Transport Telematic Applications. LIOS was the coordinator of the project.
- Project SOCRATES, System of Cellular Radio for Traffic Efficiency and Safety. The objective of the project was to investigate the use and feasibility of an RTI (Road Transport Informatic) system based on cellular radio, and to make recommendations which lead to the use of a pan-European cellular radio system such as GSM as the basis for an Integrated Road Transport Environment. As partner in the SOCRATES consortium UPC (LIOS) conducted the simulation studies for the use of floating car data in vehicle guidance.

4th Framework Programme 1995-1999

- Project IN-RESPONSE, (DG XIII/ATT), Automatic Incident Detection and Management
- Project CAPITALS, (DGVII), Advanced Wide Area Traffic Management. The objective of the project is the design, development and testing of a Traffic management System consisting of a Supervisor that co-ordinates several local Traffic Control Centres on a large urban area. The Supervisor uses an Aimsun model of the area for short term prediction of the evolution of the network state, and for evaluating alternative management strategies.

Other EU projects (5th and 6th FP):

- PRIME (Project IST-13036-1999) on automatic incident detection and incident management
- **COST Action TU903 (2010-2012). Participation in WP3 for Dynamic Estimation of OD Matrices.**

Projects from the Spanish R&D National Programs

TRA2011-27791-C03-02 ROBUSTEZ, RECUPERABILIDAD Y CONGESTIÓN EN REDES DE TRANSPORTE PUBLICO. MICINN.

Researcher in the UPC team of Project In4Mo, Advanced Information System on the Mobility of Persons and Vehicles, Reference: TSI-020100-2010-690. Program: Acción Estratégica de Telecomunicaciones y Sociedad de la Información, 2010. Subprogram: Avanza Competitividad I+D+I, 2010-2012.

Project MITRA, Reference TRA2009-14270 (subprogram MODAL), Dynamic Traffic Models for Integrated Corridor Management. Funding Agency: MICINN, Ministry of Research and Innovation. 2010-2012.

Project SIMETRIA (Ref. P 63/08, 27.11.2008), Simulation Models for the evaluation of Multimodal Global and regional Transportation Scenarios. Funding Agency: Ministry of Public Works, 2009-2011.

Project MARTA, Mobility in Advanced Transport Networks. Funding Agency: CDTI Program CENIT, 2007-2010.

Other professional experience:

1991-1993 Senior Consultant at Advanced Logistics Group S.A in Spain.

Co-founder in 1997 of TSS-Traffic Simulation Systems the spin-off company of UPC set up to commercialize, maintain and provide technical support to the microscopic traffic simulator Aimsun, developed at LIOS between 1985 and 1997, widely used today by more than 1800 users in 50 countries around the world.

Selected publications in refereed journals

J.Barceló, L.Montero, L. Marqués and C. Carmona, Travel time forecasting and dynamic of estimation in freeways based on Bluetooth traffic monitoring, Transportation Research Records: Journal of the Transportation Research Board, Vol. 2175 (2010), pp. 19-27.

L. Montero, E. Codina, J. Barceló and P. Barceló, Combining Macroscopic and Microscopic Approaches for Transportation Planning and Design of Road Networks, Transportation Research C, Volumen: 9, pp. 213-23, 2001

D. Rosas, J. Castro and L.Montero. *Using ACCPM in a simplicial decomposition algorithm for the Traffic Assignment Problem*. Computational Optimization and Applications: Volume 44, Issue 2 (2009), Page 289.

Esteve Codina y Lidia Montero. *Approximation of the Steepest Descent Direction for the OD Matrix Adjustment Problem*. **Annals of Operations Research** Volume 144 pp 329-362. May 2006. ISSN 02545330.

J.Barceló, P. Barceló, E. Codina and L. Montero, Interfacing EMME/2 with AIMSUN2 Microsimulator, Journal of University of Shanghai for Science and Technology, Vol. 21, pp. 217-230, 1999

L. Montero and J. Barceló, A Simplicial Decomposition Algorithm for the General Traffic Assignment Problem: RSDVI Problem type solving capabilities, TOP, Vol. 4, Num 2, pp. 225 - 256, 1996

Recent selected conference proceedings with peer review

Barcelo; Montero; Bullejos; Serch; Carmona (2014) *A Kalman Filter Approach for Exploiting Bluetooth Traffic Data When Estimating Time-Dependent OD Matrices*. **Journal of Intelligent Transportation Systems**. Manuscript ID: 76479. Open Access link: <http://cats.informa.com/PTS/go?t=rl&o=oa&m=764793>.

Jaume Barceló, Lidia Montero, Manuel Bullejos, M Paz Linares and Oriol Serch *Robustness And Computational Efficiency Of A Kalman Filter Estimator Of Time Dependent Od Matrices Exploiting Ict Traffic Measurements*. Transportation Research Board 2013 TRB 92th Annual Meeting, 13- 17th January, 2013 - Washington D.C
<http://amonline.trb.org/pap@PaperNo=13-3919>.

Codina, E. Fonseca, P, Colls, M. and Montero, L. *Integrating bus stop modeling and simulation in public transport network design: a survey* Proceedings of ICEAS: 2012 International Conference on Engineering and Applied Science: Beijing , China July 2012. Pp 94-106.
http://cataleg.upc.edu/record=b1419743~S1*cat.

Montero, L.; Barcelo, J.; Codina, E. *Adapting a Dynamic OD Matrix Estimation Approach for Private Traffic Based on Bluetooth Data to Passenger OD Matrices*. Proceedings of ICEAS: 2012 International Conference on Engineering and Applied Science: Beijing , China July 2012. Pp 41-49.
http://cataleg.upc.edu/record=b1419743~S1*cat. E-Prints:
<http://hdl.handle.net/2117/17737> .

Esteve Codina, Àngel Marín, Lidia Montero. *A tool for the design of public transportation services*. International Conference on Management and Service Science (MASS 2012), August 10-12, Shanghai, China. 2012 ISBN: 978-1-61284-874-7. 4
http://cataleg.upc.edu/record=b1419744~S1*cat. E-Prints:
<http://hdl.handle.net/2117/17194>.

Jaume Barceló, Lidia Montero *A use of Information and Communication Technologies in the framework of Advanced Management of Transportation systems:Dynamic OD Matrix Estimation*. International Conference on Management and Service Science (MASS 2012), August 10-12, Shanghai, China. 2012 ISBN: 978-1-61284-874-7. 4 pp.
http://cataleg.upc.edu/record=b1419744~S1*cat. E-Prints:
<http://hdl.handle.net/2117/17738>.

Jaume Barceló, Lidia Montero, Manuel Bullejos, Oriol Serch and Carlos Carmona *Dynamic OD Matrix Estimation Exploiting Bluetooth Data in Urban Networks*. Proceeding of 14 th International Conference on Automatic Control, Modelling and Simulation, Saint-Malo

(France) April 2-4 2012. ISBN: 978-1-61804-080-0. <http://www.wseas.us/e-library/conferences/2012/SaintMalo/ACMIN/ACMIN-17.pdf>
E-Prints: <http://hdl.handle.net/2117/17741>.

J.Barceló, L.Montero, M.Bullejos, O. Serch and C. Carmona, A Kalman Filter Approach for the Estimation of Time Dependent OD Matrices Exploiting Bluetooth Traffic Data Collection, Paper #12-3843 accepted for presentation at the 91st TRB Annual Meeting, January 2012.

J.Barceló, F. Gilliéron, M.P. Linares, O. Serch, L.Montero, The detection layout problem. Paper 12-2056, accepted for presentation at the 91st TRB Annual Meeting, January 2012.

J.Barceló, L.Montero, L. Marqués, and C. Carmona, ICT based estimation of time-dependent origin-destination matrices, Paper 11-2596, 90th Transportation Research Board 2011 Annual Meeting, Washington, D.C.

J.Barceló, L.Montero, L. Marqués and C. Carmona, A Kalman-Filter approach for dynamic OD estimation in corridors based on Bluetooth and Wi-Fi data collection, 12th WCTR, 2010

J. Barceló, L.Montero, L. Marqués and C. Carmona, Exploring the use of traffic data collected from new ICT based sensors to estimate time dependent OD matrices, Paper 124, Proceedings of TRISTAN VII, Tromsø, 2010.

J.Barceló, L.Montero, L. Marqués and C. Carmona, Travel time forecasting and dynamic of estimation in freeways based on bluetooth traffic monitoring, TRB Paper 10-3123, presented at 89th Transportation Research Board 2010 Annual Meeting, Washington DC.

Lidia Montero, Esteve Codina. *Making compatible two distinct zoning systems in transportation network models*. 18th IFORS 2008 Sandton – Johannesburg – South Africa Proceedings July 2008..

Lidia Montero, Esteve Codina and Angel Marín. *Design of information points for monitoring traffic conditions*. Proceeding of SEIO 2004, Cádiz (Spain) October 2004. CDROM ISBN 8468904384.

Lidia Montero y Esteve Codina. *Bilevel programming formulation for modelling the location of information points for traffic conditions* Proceedings del EURO XX Rhodes (Greece) July 2004.

Lidia Montero y Esteve Codina. *The General Traffic Assignment Problem: A Proximal Point method for equilibrium computation with applications to the Demand Adjustment Problem*. Proceedings EUROINFORMS Joint Internacional Meeting Estambul (Turkey).

Esteve Codina y Lidia Montero . *Evaluation of subgradients for the Primal Gap function of Variational Inequalities and an application to the Demand Adjustment Problem*. Proceedings EUROINFORMS Joint Internacional Meeting Estambul (Turkey) July 2003.

Esteve Codina y Lidia Montero . *Application to the Proximal Point Algorithm to the General Traffic Assignment Problem*. Congreso de la Sociedad Española de Estadística e Investigación Operativa, Lleida, April 2003.

J.Barcelo, J. Ferrer , J. Casas, L.Montero and J.Perarnau . *Microscopic Simulation with AIMSUN for the assessment of Incident Management Strategies*. ITS Lyon (ERTICO): E-safety congress & exhibition Esafety congrès & exposition IT solutions for safety and security in intelligent transport solutions en faveur de la sécurité et de la sîreté dans les transports intelligents, Lyon 1618 september.

J.Barceló, A.G. Dumont, L. Montero, J. Perarnau and A. Torday. *Safety Indicators for microsimulationbased assessments*. Proceedings Transportation Research Board 82nd Annual Meeting, Washington D.C., January 2.002.

J.Barcelo, L.Montero and J.Perarnau (UPC). *Automatic detection and estimation of incident probabilities for incident management purposes. A case study in Barcelona*. Proceedings ITS Bilbao (ERTICO), 20 al 23 June 2.001.

E.Codina and L.Montero. *A Method to approximate the Steepest Descent direction of the O/D Matrix Adjustment problem*. Proceedings TRISTANIV, Ponta Delgada (Azores, Portugal) June 2.001.

D. Rosas, J. Castro and L.Montero.*Using ACCPM in the master problem of a restricted simplicial decomposition algorithm for the Traffic Assignment problem*. Proceedings TRISTANIV, Ponta Delgada (Azores, Portugal) June 2.001.