Dr. **Jamal Toutouh**

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Personal Statement

At present I am involved in the moveON project as a research associate at the University of Málaga. The project aims to apply emerging algorithms to smart mobility issues. My broad research interests are in optimization algorithms and computational methods, especially those arising from or applicable to real-world systems. I have a specific interest in applying them to communication networks, smart mobility, urban planning and machine learning. However, as one of life's enthusiasts, I am open to new and unknown challenges. My experience in sport, firstly as a player, and later as a coach, enables me to feel confident working independently or as part of a team. I am adaptable, resourceful, and self-motivated.

Education

PhD in Computer Science (Doctor Europeus)

Málaga, Spain

E.T.S. Ingeniería Informática (University of Málaga) *January 2016*

Dissertation Title: **Natural Computing for Vehicular Networks**. With *Cum Laude* honors.

Key features of research:

- In-depth analysis of the emerging field of vehicular networks and identification of the most important arising research challenges.
- Formulation of optimization problems to address vehicular networks and smart mobility issues by applying Natural Computing.
- Devising new Natural Computing operators and algorithms to enhance the performance of state-of-the-art methods.
- Modeling and simulating vehicular environments by using real world maps and mobility models to evaluate the proposed solutions.
- Real world pilots (hardware and software) for vehicular communications testbeds.

Original research published in five ISI JCR indexed journals and in thirteen prestigious conferences and workshops.

MSc in Software Engineering and Artificial Intelligence

Málaga, Spain

E.T.S. Ingeniería Informática (University of Málaga) *September 2010*

- This Master's degree is part of the doctoral programme of the University of Málaga, and is considered as a requirement to enter the PhD research level.
- Main Areas: Artificial Intelligence, Machine Learning, and Software Engineering.
- Dissertation Title: 'Metaheuristics for the Optimal Configuration of the OLSR Routing Protocol in Vehicular Networks". With honors.

MSc in Information and Computer Sciences - Intelligent and Adaptive Systems.

Luxembourg, Luxembourg

Faculty of Science, Technology and Communication (University of Luxembourg) *July 2010*

- Main Areas: Intelligent Agents, Multi-agent Systems, Neural Networks, Logic/Semantic-based Reasoning, and Multi-criteria Decision Making/Optimization.
- Dissertation Title: 'Metaheuristics for Optimal Transfer of P2P Information in VANETs".

Research Experience

moveON: Metaheuristics, Holistic Intelligence, and Smart Mobility

Málaga, Spain

Research associate. E.T.S. Ingeniería Informática (University of Málaga) *Jan. 2015 - Exp. Dec. 2017*

Founded by the Spanish Ministry of Economy and Competitiveness and FEDER (TIN2014-57341-R).

CellCar: Advanced Cellular Technologies for Connected Cars

Doha, Qatar

Research collaborator. Qatar Mobility Innovations Center (QMIC) *Sep. 2015 - Nov. 2015*

Founded by the Qatar National Research Fund.

maxCT: Movilidad Inteligente: Wifi, Rutas y Contaminación

Málaga, Spain

Research collaborator. E.T.S. Ingeniería Informática (University of Málaga) *Jan. 2015 - Dec. 2015*

Founded by the regional AOP GGI3003IDII

TABS: Teoría, Algoritmos Bioinspirados y Software

Málaga, Spain

Research collaborator. E.T.S. Ingeniería Informática (University of Málaga) *Jan. 2015 - Jun. 2015*

Founded by the Spanish initiative FEDER.

roadME: Fundamentals for Real World Applications of Metaheuristics *Málaga, Spain*

Scientific collaborator. E.T.S. Ingeniería Informática (University of Málaga) *Jan. 2012 - Dec. 2015*

Founded by the Spanish Ministry of Economy and Competitiveness (TIN2011-28194).

DIRICOM: Intelligent Design of Wireless Communication Networks *Málaga, Spain*

Research associate. E.T.S. Ingeniería Informática (University of Málaga) *Dec. 2009 - Jan. 2012*

Founded by the regional ministry for Innovation, Science, and Business (P07-TIC-03044).

CARLINK. Wireless Traffic Service Platform for Linking Cars *Málaga, Spain*

Research associate. E.T.S. Ingeniería Informática (University of Málaga) *Oct. 2007 - Oct. 2008*

Founded by the European European EUREKA-CELTIC initiative (FIT-330225-2007-1).

Journals

[J07] R. Massobrio, J. Toutouh, S. Nesmachnow, E. Alba, **Infrastructure Deployment in Vehicular Communication Networks Using a Parallel Multiobjective Evolutionary Algorithm**, *International Journal of Intelligent Systems*, Vol. 32, Issue 8, pp 801-829, Wiley Periodicals, 2017. doi:10.1002/int.21890, *In Press*

[J06] J. Toutouh, E. Alba, **Parallel multi-objective metaheuristics for smart communications in vehicular networks**, Vol. 21, Issue 8, *Soft Computing*, Vol. 21, Issue 8, pp. 1949-1961, Springer, 2017. doi:10.1007/s00500-015-1891-2

[J05] J. Toutouh, E. Alba, **Light commodity devices for building vehicular ad hoc networks: An experimental study**, *Ad Hoc Networks*, Vol. 37, pp. 499-511, Elsevier, 2016. doi:10.1016/j.adhoc.2015.09.013

[J04] J. Toutouh, E. Alba, **Metaheuristics for energy-efficient data routing in vehicular networks**, *International Journal of Metaheuristics*, Vol. 4, Issue 1, pp. 27-56, Inderscience Publishers (IEL), 2015. doi:10.1504/IJMHEUR.2015.071750

[J03] J. Toutouh, S. Nesmachnow, E. Alba, **Fast energy-aware OLSR routing in VANETs by means of a parallel evolutionary algorithm** *Cluster Computing*, Vol. 16, Issue 3, pp. 435-450, Springer US, 2013. doi:10.1007/s10586-012-0208-9

[J02] J. Toutouh, J. García-Nieto, E. Alba, **Intelligent OLSR Routing Protocol Optimization for VANETs**, *Vehicular Technology, IEEE Transactions on.*, Vol. 61, Issue 4, pp. 1884-1894, IEEE, 2012. doi:10.1109/TVT.2012.2188552

[J01] J. García-Nieto, J. Toutouh, E. Alba, **Automatic Tuning of Communication Protocols for Vehicular Ad-Hoc Networks Using Metaheuristics**, *Engineering Applications of Artificial Intelligence*. Special Issue: Advances in metaheuristics for hard optimization: new trends and case studies, Vol. 23, Issue 5, pp. 795-805, Springer, 2010. doi:10.1016/j.engappai.2010.01.012

Book Chapters

[B01] R. Massobrio, J. Toutouh, S. Nesmachnow, **Multiobjective evolutionary algorithms for smart placement of roadside units in vehicular networks**, N. Nedjah, L. M. Mourelle, H. S. Lopes (Eds.), *Evolutionary Multi-Objective System Design: Theory and Applications*, pp 86-114, June, 2017, Chapman and Hall/CRC. ISBN: 9781498780285

Conferences

[C17] J. Toutouh, J. Arellano-Verdejo, E. Alba, **Enabling Low Cost Smart Road Traffic Sensing**, in *The 12th edition of the Metaheuristics International Conference (MIC 2017)*, Barcelona, Spain, pp 13-15, 2017. URI: http://hdl.handle.net/10630/14188

[C16] J. Toutouh, E. Alba, **Distributed Fair Rate Congestion Control for Vehicular Networks**, in *Distributed Computing and Artificial Intelligence, 13th International Conference*, Sevilla, Spain, pp 433-442, 2016. doi:10.1007/978-3-319-40162-1_47

[C15] C. Cintrano, D. H. Stolfi, J. Toutouh, F. Chicano, E. Alba, **CTPATH: A Real World System to Enable Green Transportation by Optimizing Environmentally Friendly Routing Paths**, in *International Conference on Smart Cities*, Málaga, Spain, pp 63-75, 2016. doi:10.1007/978-3-319-39595-1_7

[C14] R. Massobrio, J. Toutouh, S. Nesmachnow, E. Alba, **Smart placement of RSU for vehicular networks using multiobjective evolutionary algorithms**, in *2nd Latin American Congress on Computational Intelligence (LA-CCI)*, Curitiba, 2015. doi:10.1109/LA-CCI.2015.7435974

[C13] R. Massobrio, J. Toutouh, S. Nesmachnow, **A multiobjective evolutionary algorithm for infrastructure location in vehicular networks**, in *7th European Symposium on Computational Intelligence and Mathematics*, pp 1-6, 2015. doi:10.13140/RG.2.1.1965.0006

[C12] Z. Hameed Mir, J. Toutouh, F. Filali, E. Alba, **QoS-Aware Radio Access Technology (RAT) Selection in Hybrid Vehicular Networks**, in *Communication Technologies for Vehicles.* LNCS 9066. pp 117-128, 8th International Workshop, Nets4Cars/Nets4Trains/Nets4Aircraft 2015, Sousse, Tunisia, May, 2015. doi:10.1007/978-3-319-17765-6_11

[C11] J. Toutouh, E. Alba, **Optimizing Telecommunications in Vehicular Networks with a Parallel Multiobjective PSO**, in *22nd International Conference on Multiple Criteria Decision Making (MCDM2013)*, pp 295, June, 2013. URI: http://hdl.handle.net/10630/5915

[C10] J. Toutouh, E. Alba, **Parallel Swarm Intelligence for VANETs Optimization**, in *Proceedings of the Seventh International Conference on P2P, Parallel, Grid, Cloud and Internet Computing (3PGCIC-2012)*, pp 285 -290, November, 2012. doi:10.1109/3PGCIC.2012.53

[C09] J. Toutouh, E. Alba, **Multi-objective OLSR optimization for VANETs**, *Proceedings of the 2012 IEEE 8th International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob)*, pp 571-578, October, 2012. doi:10.1109/WiMOB.2012.6379133.

[C08] J. Toutouh, E. Alba, **Green OLSR in VANETs with Differential Evolution**, in *Proceedings of the fourteenth international conference on Genetic and evolutionary computation conference companion (GECCO Companion '12)*, pp 11-18, Terence Soule (Ed.). ACM, New York, NY, USA, 2012. doi:10.1145/2330784.2330787

[C07] J. Toutouh, S. Nesmachnow, E. Alba, **Evolutionary Power-Aware Routing in VANETs using Monte-Carlo Simulation**, in *Proceedings of The 10th International Conference on High Performance Computing and Simulation (HPCS 2012)*, pp 119-125, IEEE Computer Society Press, Madrid, Spain, July, 2012.

[C06] J. Toutouh, E. Alba, **Optimizing OLSR in VANETS with Differential Evolution: A Comprehensive Study**, in *First ACM International Symposium on Design and Analysis of Intelligent Vehicular Networks and Applications (DIVANet'11)*, Miami, Florida, USA, November, 2011. doi:10.1145/2069000.2069002

[C05] J. Toutouh, E. Alba, **An Efficient Routing Protocol for Green Communications in Vehicular Ad-hoc Networks**, in *Proceedings of the 13th annual conference companion on Genetic and evolutionary computation (GECCO '11)*, pp 719-726, Natalio Krasnogor (Ed.). ACM, New York, NY, USA, 2011. doi:10.1145/2001858.2002076

[C04] J. Toutouh, E. Alba, **Performance Analysis of Optimized VANET Protocols**, in *Wireless Communications and Mobile Computing 2011 (IWCMC2011)*, Istanbul (Turkey), 2011. doi:10.1109/IWCMC.2011.5982718

[C03] J. Toutouh, J. García-Nieto, E. Alba, **Optimal Configuration of OLSR Routing Protocol for VANETs by Means of Differential Evolution**, in *3rd International Conference on Metaheuristics and Nature Inspired Computing (META'2010)*, D'Jerba, Tunisia, October, 2010.

[C02] J. Toutouh, J. García-Nieto, E. Alba, **Configuración Óptima del Protocolo de Encaminamiento OLSR para VANETs Mediante Evolución Diferencial**, in *Congreso Español de Metaheurísticos, Algoritmos Evolutivos y Bioinspirados 2010 (MAEB'10)*, pp. 463-471, Valencia, Spain, 2010.

[C01] E. Alba, S. Luna, and J. Toutouh, **Accuracy and Efficiency in Simulating VANETs**, in *Modelling, Computation and Optimization in Information Systems and Management Sciences*, pp 568–578, Physica Verlag, Springer-Verlag, London, UK, 2008. doi:10.1007/978-3-540-87477-5_60

Research Visits

Qatar Mobility Innovations Center (QMIC) *Doha, Qatar*

Responsable: **Dr. Fethi Filali** *Sep. 2014 - Dec. 2014*

Duration: Three months.

Centria University of Applied Sciences *Ylivieska, Finland*

Responsable: **Joni Jämsa** *Nov. 2012 - Dec. 2012*

Duration: 18 days.

Teaching

Programming II *In Telematics Engineering*

2nd semester (core subject) *2014 - 2015*

Programming II *In Sound and Image Engineering*

2nd semester (core subject) *2014 - 2015*

Information Systems on Internet *In Computing Engineering*

6th semester (core subject) *2013 - 2014*

Programming II *In Sound and Image Engineering*

2nd semester (core subject) *2014 - 2015*

Awards

2014 **Spin-Off 2014**, founded and awarded by the University of Málaga and Málaga Council *Málaga, Spain*

2013 **Doctoral Consortium 2013**, second prize awarded by the Spanish Association for AI *Madrid, Spain*

Program Committees

2017 **Organizing Committee**, Special session on Smart Cities at MIC 2017 *Barcelona, Spain*

2017 **Organizing Committee**, International Conference on Smart Cities: smartCT'17 *Málaga, Spain*

2017 **Program Committee**, International Conference on Smart Cities: smartCT'17 *Málaga, Spain*

2017 **Organizing Committee**, Summer School on Search Based Software Engineering *Málaga, Spain*

2016 **Program Committee**, Real World Applications at GECCO 2016 *Denver, USA*

2016 **Organizing Committee**, International Conference on Smart Cities: smartCT'16 *Málaga, Spain*

2016 **Program Committee**, International Conference on Smart Cities: smartCT'16 *Málaga, Spain*

2015 **Organizing Committee**, Metaheuristics for Smart Cities at MIC 2015 *Agadir, Morocco*