

# Dr. Jamal Toutouh

POSTDOCTORAL RESEARCHER · UNIVERSITY OF MALAGA  
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## Education

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### PhD in Computer Science (Doctor Europeus)

*E.T.S. Ingeniería Informática* (University of Malaga)

*Malaga, Spain*

*January 2016*

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

Key features of research:

- In-depth analysis of the emerging field of vehicular networks and its main challenges.
- Formulation of optimization problems to address vehicular networks and smart mobility.
- Devising 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.
- 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.

### M.Sc. in Software Engineering and Artificial Intelligence

*E.T.S. Ingeniería Informática* (University of Malaga)

*Malaga, Spain*

*January 2011*

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

### M.Sc.in Information and Computer Sciences - Intelligent and Adaptive Systems

Faculty of Science, Technology and Communication (University of Luxembourg)

*Luxembourg, Luxembourg*

*July 2010*

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

## Research Projects

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### FIQARE – Generic Enablers in FIWARE

Research collaborator. *E.T.S. Ingeniería Informática* (University of Malaga)

*Malaga, Spain*

*Jan. 2017 - Exp. Dic. 2020*

Founded by the European EUREKA-CELTIC PLUS initiative (C2017/2-2).

### 6CITY: Cross-Intelligence for Smart Cities

Research collaborator. *E.T.S. Ingeniería Informática* (University of Malaga)

*Malaga, Spain*

*Jan. 2017 - Exp. Dic. 2021*

Founded by the Spanish Ministry of Economy and Competitiveness and FEDER (TIN2017-88213-R).

### moveON: Metaheuristics, Holistic Intelligence, and Smart Mobility

Research associate. *E.T.S. Ingeniería Informática* (University of Malaga)

*Malaga, Spain*

*Jan. 2015 - Exp. Jun. 2018*

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

### CellCar: Advanced Cellular Technologies for Connected Cars

Research collaborator. Qatar Mobility Innovations Center (QMIC)

*Doha, Qatar*

*Sep. 2015 - Dec. 2015*

Founded by the Qatar National Research Fund.

### maxCT –Movilidad Inteligente: Wifi, Rutas y Contaminación

Research collaborator. *E.T.S. Ingeniería Informática* (University of Malaga)

*Malaga, Spain*

*Jan. 2015 - Dec. 2015*

Founded by the regional AOP GGI3003IDII (Andalusian).

### TABS: Teoría, Algoritmos Bioinspirados y Software

Scientific collaborator. *E.T.S. Ingeniería Informática* (University of Malaga)

*Malaga, Spain*

*Jan. 2015 - Jun. 2015*

Founded by the Spanish initiative FEDER.

*Malaga, Spain*

**roadME: Fundamentals for Real World Applications of Metaheuristics**  
Research collaborator. *E.T.S. Ingeniería Informática* (University of Malaga)  
Founded by the Spanish Ministry of Economy and Competitiveness (TIN2011-28194).

Jan. 2012 - Dec. 2015

**DIRICOM: Intelligent Design of Wireless Communication Networks**  
Research associate. *E.T.S. Ingeniería Informática* (University of Malaga)  
Founded by the regional ministry for Innovation, Science, and Business (P07-TIC-03044).

Malaga, Spain  
Dec. 2009 - Jan. 2012

**CARLINK. Wireless Traffic Service Platform for Linking Cars**  
Research associate. *E.T.S. Ingeniería Informática* (University of Malaga)  
Founded by the European EUREKA-CELTIC initiative (FIT-330225-2007-1).

Malaga, Spain  
Oct. 2007 - Oct. 2008

## Journals

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- [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.
- [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.
- [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.
- [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.
- [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.
- [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.
- [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.

## Book Chapters

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- [B01] R. Massobrio, J. Toutouh, S. Nesmachnow, Multiobjective evolutionary algorithms for smart placement of road side 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

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- [C19] J. Toutouh, J. Arellano-Verdejo, E. Alba, Enabling Low Cost Smart Road Traffic Sensing, *The 12th edition of the Metaheuristics International Conference (MIC 2017)*, pp. 13-15, 2017.
- [C18] J. Toutouh, E. Alba, Distributed Fair Rate Congestion Control for Vehicular Networks, *13th International Conference Distributed Computing and Artificial Intelligence*, pp. 433-442, June 2016.
- [C17] 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, *International Conference on Smart Cities*, 63-75, 2016.
- [C16] R Massobrio, J. Toutouh, S. Nesmachnow, E. Alba, Smart placement of RSU for vehicular networks using multiobjective evolutionary algorithms, *2nd Latin American Congress on Computational Intelligence* 1-6, 2015.
- [C14] R Massobrio, J. Toutouh, S Nesmachnow, A multiobjective evolutionary algorithm for infrastructure location in vehicular networks, *7th European Symposium on Computational Intelligence and Mathematics* 1-6, 2015.

- [C13] Z. Hameed Mir, J. Toutouh, F. Filali, E. Alba, QoS-Aware Radio Access Technology (RAT) Selection in Hybrid Vehicular Networks, *Communication Technologies for Vehicles. LNCS 9066*. 117-128, 8th International Workshop, Nets4Cars/Nets4Trains/Nets4Aircraft 2015, Sousse, Tunisia, 6-8 May, 2015.
- [C15] J. Toutouh, E. Alba, Comunicación eficiente entre vehículos aplicando un algoritmo multi-objetivo paralelo, *In X Congreso Español de Metaheurísticos, Algoritmos Evolutivos y Bioinspirados 2015 (MAEB 2015)*, 503-510, 2015, Mérida-Almendralejo, Spain.
- [C12] 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, 17-21 June 2013.
- [C11] J. Toutouh, E. Alba, Computación Natural en Redes Vehiculares, In Congreso de la Asociación Española para la Inteligencia Artificial (CAEPIA'13), pages 1740-1745. Madrid, Spain, 20013.
- [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)*, 285 -290, November 2012.
- [C09] J. Toutouh, E. Alba, Multi-objective OLSR optimization for VANETs, *In Proceedings of the 2012 IEEE 8th International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob)*, 571-578, 8-10 October 2012.
- [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)*, Terence Soule (Ed.). ACM, 2012, NY, USA, 11-18.
- [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)*, IEEE Computer Society Press, July, 2012, Madrid, Spain, 119-125.
- [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)*, November, 2011, Miami, Florida, USA.
- [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)*, Natalio Krasnogor (Ed.), 2011, ACM, New York, USA, 719-726.
- [C04] J. Toutouh, E. Alba, Performance Analysis of Optimized VANET Protocols in Real World Tests, *in Wireless Communications and Mobile Computing 2011 (IWCMC2011)*, 2011, Istanbul (Turkey).
- [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)*, October, 2010, D'Jerba (Tunissia).
- [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, Septiembre 2010, Valencia, Spain.
- [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*, pages 568–578, London, UK, 2008.

## Awards and Grants

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### Marie Skłodowska Curie International Fellowship

Funded and awarded by the European Commission.

Boston, USA - Malaga, Spain

2014

### Spin-Off 2014

Funded and awarded by the University of Malaga and Malaga City council.

Malaga, Spain

2014

### Short stay grant for FPU holders (Est13/00988)

Founded by the Spanish Ministry of Education.

Madrid, Spain

2014

### Doctoral Consortium AEPIA 2013

Best research hypothesis entitled “Natural Computing for Vehicular Networks”.

Madrid, Spain

2013

**Grants of Education's University Faculty Training (FPU) programme (AP2010-3108)**  
Founded by the Spanish Ministry of Education.

*Madrid, Spain*  
2012

## Research Visits

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**Qatar Mobility Innovations Center (QMIC)**  
Supervisor: Dr. Fethi Filali

*Doha, Qatar*  
*Sep. 2014 - Dec. 2014*

**Centria University of Applied Sciences**  
Supervisor: Joni Jämsä

*Ylivieska, Finland*  
*Nov. 2012 - Dec. 2012*

## Organization in International Events

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**Special session on Smart Cities at MIC 2017**  
Organizing committee

*Barcelona, Spain*  
2017

**International Conference on Smart Cities: smart CT'17**  
Program and organizing committee

*Malaga, Spain*  
2017

**Summer School on Search Based Software Engineering**  
Organizing committee

*Malaga, Spain*  
2017

**Real World Applications at GECCO 2016**  
Program committee

*Denver, USA*  
2016

**International Conference on Smart Cities: smartCT'16**  
Program and organizing committee

*Malaga, Spain*  
2016

**Metaheuristics for Smart Cities at MIC 2015**  
Organizing committee

*Agadir, Morocco*  
2015

## Memberships of Scientific and Professional Societies

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Research Thematic Network on Smart Cities  
*Red Temática de Investigación en Ciudades Inteligentes*  
(Ref.: TIN2016-81766-REDT)

European Innovation Partnership on Smart Cities and Communities (Ref.: 6904)

COST Action - Improving Applicability of Nature-Inspired Optimisation by Joining Theory and Practice  
(Ref.: CA15140)

Working Group on Heuristics of the Statistics and Operations Research Spanish Society  
*Grupo de Trabajo en Heurísticas de la Sociedad Española de Estadística e Investigación Operativa*  
(Refs.: TIC2002-10886E and TIN2004-20061E)

## Teaching

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**Foundations of Programming**  
1st Semester (Core subject)

*In Computing Engineering*  
2017 - 2018

**Programming II**  
2nd Semester (Core subject)

*In Telematics Engineering*  
2014 - 2015

**Programming II**  
2nd Semester (Core subject)

*In Sound and Image Engineering*  
2014 - 2015

**Information Systems on Internet**  
6th Semester (Core Subject)

*In Computing Engineering*  
2013 - 2014

**Programming II**  
2nd Semester (Core subject)

*In Sound and Image Engineering*  
2013 - 2014