

Dr. Jamal Toutouh

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Education

PhD in Computer Science (Doctor Europeus)

Malaga, Spain

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

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

Malaga, Spain

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

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

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 and Optimization.
- Dissertation: “Metaheuristics for Optimal Transfer of P2P Information in VANETs”.

Research Projects

FIQARE – Generic Enablers in FIWARE

Malaga, Spain

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

Jan. 2017 - Exp. Dic. 2020

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

6CITY: Building intelligent applications in a smart city

Malaga, Spain

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

Jan. 2017 - Exp. Dic. 2021

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

moveON: Metaheuristics, Holistic Intelligence, and Smart Mobility

Malaga, Spain

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

Jan. 2015 - Jul. 2018

Funded 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 - Dec. 2015

Funded by the Qatar National Research Fund.

maxCT –Movilidad Inteligente: Wifi, Rutas y Contaminación

Malaga, Spain

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

Jan. 2015 - Dec. 2015

Funded by the regional AOP GGI3003IDII (Andalusian).

TABS: Teoría, Algoritmos Bioinspirados y Software

Malaga, Spain

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

Jan. 2015 - Jun. 2015

Funded by the Spanish initiative FEDER.

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

Malaga, Spain
Jan. 2012 - Dec. 2015

DIRICOM: Intelligent Design of Wireless Communication Networks
Research associate. *E.T.S. Ingeniería Informática* (University of Malaga)
Funded 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)
Funded by the European EUREKA-CELTIC initiative (FIT-330225-2007-1).

Malaga, Spain
Oct. 2007 - Oct. 2008

Journals

- [J09] J. Toutouh, E. Alba, A swarm algorithm for collaborative traffic in vehicular networks, *Vehicular Communications*, Vol. 12, pp. 127-137, Elsevier, 2018.
- [J08] S. Nesmachnow, D. Rossit, J. Toutouh, Comparison of Multiobjective Evolutionary Algorithms for Prioritized Urban Waste. *Electronic Notes in Discrete Mathematics*. In press.
- [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

- [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

- [C22] A. Camero, J. Toutouh, D.H. Stolfi, E. Alba, Evolutionary Deep Learning for Car Park Occupancy Prediction in Smart Cities, *International Conference on Learning and Intelligent Optimization, LION 12*, pp. 1-15, 2018.
- [C21] J. Toutouh, E. Alba, Conducción Social Cooperativa en Ciudades Inteligentes International, *Greencities Congress 2018*, pp. 60-75, 2018.
- [C20] J. Toutouh, D. Rossit, S. Nesmachnow, Computational intelligence for locating garbage accumulation points in urban scenarios, *International Conference on Learning and Intelligent Optimization, LION 12*, pp. 1-15, 2018.
- [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.

Grants

EU Marie Skłodowska-Curie Actions Individual Fellowship – Global Fellowship (8.06.UE/47.8041) Funded by the European Commission within the framework of Horizon 2020.	<i>Brussels, Belgium</i> 2018
Postdoctoral contract - I Plan Propio de Investigación y Transferencia de la Universidad de Málaga Funded by the University of Malaga	<i>Malaga, Spain</i> 2017
Short stay grant for FPU holders (Est13/00988) Funded by the Spanish Ministry of Education.	<i>Madrid, Spain</i> 2014
Grants of Education's University Faculty Training (Formación de Profesorado Universitario, FPU) programme (AP2010-3108) Funded by the Spanish Ministry of Education.	<i>Madrid, Spain</i> 2012

Awards

Best PhD Thesis Award “University Chair Aytos-Berger Levrault on the Development of Smart Governance” Funded and awarded by the University of Malaga, University of Sevilla, and Aytos-Berger Levrault group.	<i>Malaga, Spain</i> 2018
Best PhD Thesis Award (2016/2017) Funded and awarded by the University of Malaga	<i>Malaga, Spain</i> 2018
Spin-Off 2014 Funded and awarded by the University of Malaga and Malaga City council.	<i>Malaga, Spain</i> 2014
Doctoral Consortium AEPIA 2013 Best research hypothesis entitled “Natural Computing for Vehicular Networks”.	<i>Madrid, Spain</i> 2013

Research Visits

Qatar Mobility Innovations Center (QMIC) Supervisor: Dr. Fethi Filali	<i>Doha, Qatar</i> Sep. 2014 - Dec. 2014
Centria University of Applied Sciences Supervisor: Joni Jämsä	<i>Ylivieska, Finland</i> Nov. 2012 - Dec. 2012

Program Committees

Special session on Smart Cities at MIC 2017 Organizing committee	<i>Barcelona, Spain</i> 2017
International Conference on Smart Cities: smart CT'17 Organizing committee	<i>Malaga, Spain</i> 2017
International Conference on Smart Cities: smartCT'17 Program committee	<i>Malaga, Spain</i> 2017
Summer School on Search Based Software Engineering Organizing committee	<i>Malaga, Spain</i> 2017
Real World Applications at GECCO 2016 Program committee	<i>Denver, USA</i> 2016
International Conference on Smart Cities: smartCT'16 Organizing committee	<i>Malaga, Spain</i> 2016
International Conference on Smart Cities: smartCT'16 Program committee	<i>Malaga, Spain</i> 2016

Memberships of Scientific and Professional Societies

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

Programming I 1st Semester (Core subject)	<i>In Computing Engineering</i> 2017 - 2018
Programming II 2nd Semester (Core subject)	<i>In Telematics Engineering</i> 2014 - 2015
Programming II 2nd Semester (Core subject)	<i>In Sound and Image Engineering</i> 2014 - 2015
Information Systems on Internet 6th Semester (Core Subject)	<i>In Computing Engineering</i> 2013 - 2014
Programming II 2nd Semester (Core subject)	<i>In Sound and Image Engineering</i> 2013 - 2014