

FECHA: 15 de enero de 2024

NOMBRE Y APELLIDOS: María del Mar Gallardo Melgarejo

CUERPO: Catedrático de Universidad

UNIVERSIDAD O CENTRO: Universidad de Málaga

RAMA DE CONOCIMIENTO: Ingeniería y Arquitectura

ÁREA DE CONOCIMIENTO: Lenguajes y Sistemas Informáticos

SEXENIOS (RD 1086/89): 4

ACTIVIDAD INVESTIGADORA, DE TRANSFERENCIA E INTERCAMBIO DE CONOCIMIENTO:

Publicaciones (Revistas Indexadas en los últimos 10 años)

1. Delia Rico, María-del-Mar Gallardo, Pedro Merino, Verification of a multi-connectivity protocol for Tactile Internet applications, Computer Communications, Volume 212, pp 390-406 (2023)
2. Francisco Luque-Schempp, Laura Panizo, María-del-Mar Gallardo, Pedro Merino: AutomAdapt: Zero Touch Configuration of 5G QoS Flows Extended for Time-Sensitive Networking. IEEE Access 11: 82960-82977 (2023)
3. L. Panizo (AC), M.M Gallardo. STAn: Analysis of data traces using an Event-driven Interval Temporal Logic. Journal of Automatic Software Engineering, 30 (3) 2023 doi: 10.1007/s10515-022-00367-5
4. Francisco Luque Schempp, Laura Panizo, María-del-Mar Gallardo, Pedro Merino. Towards Zero Touch Configuration of 5G Non-Public Networks for Time Sensitive Networking. IEEE Networks, Volume: 36 Issue: 2 (2022)
5. Ana-Rosario Espada, María-del-Mar Gallardo, Alberto Salmerón, Laura Panizo and Pedro Merino. A formal approach to automatically analyze extra-functional properties in mobile applications. SOFTWARE TESTING, VERIFICATION AND RELIABILITY. 29(4-5) (2019)
6. María-del-Mar Gallardo, Pedro Merino, Laura Panizo, Alberto Salmerón. Integrating river basin DSSs with model checking. Int J Soft Tools Techn Transfer STTT 20(5): 499-514 (2018)
7. Ana Rosario Espada, Maria-del-Mar Gallardo; Alberto Salmerón, Pedro Merino. Performance Analysis of Spotify® for Android with Model-Based Testing. Mobile Information Systems. Volume 2017 (2017), Article ID 2012696, 14 pages.
8. Marco Comini, Maria-del-Mar Gallardo, Laura Título, Alicia Villanueva. A program analysis framework for tcp based on abstract interpretation. Formal Aspects of Computing, 29(3) 531-557 (2017),
9. María-del-Mar Gallardo, David Sanán: Verification of complex dynamic data tree with mu-calculus. Automatic Software Engineering 20(4): 569-612 (2013)
10. María-del-Mar Gallardo, Laura Panizo: Extending model checkers for hybrid system verification: the case study of SPIN. Software Testing, Verification and Reliability. 24(6): 438-471 (2014)
11. Damián Adalid, Alberto Salmerón, María-del-Mar Gallardo, Pedro Merino: Using SPIN for automated debugging of infinite executions of Java programs. J of Systems and Software 90: 61-75 (2014)

Publicaciones en congresos y workshops (en los últimos 10 años)

1. Mario Comini, María-del-Mar Gallardo, Alicia Villanueva: A denotational semantics for PROMELA addressing arbitrary jumps. Pre-proceedings of the 31st International Symposium on Logic-based Program Synthesis and Transformation (LOPSTR2021)
2. Delia Rico, María-del-Mar Gallardo, Pedro Merino: Modeling and verification of the Multi-connection Tactile Internet Protocol. 24th International Conference on Modeling, Analysis and Simulation of Wireless and Mobile systems. 2021
3. María-del-Mar Gallardo, Laura Panizo: Trace Analysis Using an Event-Driven Interval Temporal Logic. LOPSTR 2019: 177-192
4. María-del-Mar Gallardo, Laura Panizo: Teaching Formal Methods: From Software in the Small to Software in the Large. FMTea2019: 97-110
5. María-del-Mar Gallardo, Francisco Luque-Schempp, Pedro Merino Gómez, Laura Panizo: How Formal Methods Can Contribute to 5G Networks. From Software Engineering to Formal Methods and Tools, and Back 2019. LNCS-11865: 548-571
6. L. Panizo; A. Salmerón; M. M. Gallardo and P. Merino. Guided test case generation for mobile apps in the TRIANGLE project: work in progress. In Proc. of the 24th ACM SIGSOFT International SPIN Symposium on Model Checking of Software. págs. 192-195. ACM, 2017. DOI: 10.1145/3092282.3092298.
7. M. M. Gallardo; P. Merino; L. Panizo and A. Salmerón. River Basin Management with SPIN. In Dragan Bošnački; Anton Wijs (Eds.). Model Checking Software: 23rd. International Symposium, SPIN 2016. Eindhoven, The Netherlands, April 7-8, 2016. Proceedings. Lecture Notes in Computer Science. 9641. pp. 78-96. Springer: Switzerland, 2016. DOI: 10.1007/978-3-319-32582-8.
8. M. M. Gallardo; L. Lavado and L. Panizo. A simulation tool for tcp programs. In [Proc. of 24th International Workshop on Functional and (Constraint) Logic Programming (wflp 2016), september 13-14, 2016], 2016.
9. A. Linares; J. Regodón; L. Panizo; M. M. Gallardo and P. Merino. A DSS for reservoir operation based on the execution of formal models. In Proc of [11th International conference on hydroinformatics. HIC 2014, New York, USA, 17-21 august, 2014]. pp. 8, 2014. ISBN: 978-0-692-28129-1
10. Marco Comini María-del-Mar Gallardo Laura Titolo Alicia Villanueva. Abstract Analysis of Universal Properties for tcp. Proc. of 25th International Symposium on Logic-Based Program Synthesis and Transformation (LOPSTR2015) – LNCS 9527, 163-178 2015
11. Alberto Salmerón, Leticia Lavado, María-del-Mar Gallardo, Pedro Merino Gómez. Adding Correctness Checking to Test Automation Platform. Proceedings of the 2017 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW)132-138 2017
12. Ana Rosario Espada, María-del-Mar Gallardo, Alberto Salmerón, Pedro Merino. Using Model Checking to Generate Test Cases for Android Applications. Proceedings Tenth Workshop on Model Based Testing, MBT 2015 7-21
13. Ana Rosario Espada, María-del-Mar Gallardo, Alberto Salmerón, Pedro Merino. Runtime Verification of Expected Energy Consumption in Smartphones. Proc. of the 22nd International Symposium on Model Checking Software - SPIN 2015, LNCS-9232, 132-149 2015

Participación en Proyectos de investigación

1. Construcción de gemelos digitales formales para la reconfiguración automática de sistemas complejos. PID2022-142181OB-I00, IP: María del Mar Gallardo, Laura Panizo. Ministerio de Ciencia e Innovación. 94.625,00 €.
2. 5G+TACTILE. 5G+TACTILE_1: Network Technologies and new protocols for deterministic over B5G/6G, MINECO-Spanish Government, TSI-063000-2021-11, 36 months, 2022-2024, 920.000€ Co-scientific director

3. DAD-IOT: Construction, Analysis and Deployment of IoT Applications. National project TIN2015-67083-R. IP: Ernesto Pimentel, María del Mar Gallardo. Ministerio de Economía y Competitividad, 77.924 €.
4. Check-it: New extensions of Formal Techniques of for the modelling, verification, synthesis and optimization of embedded systems and mobile communications: Application to LTE protocol certification. Regional Project: P11-TIC-07659, 2013-2015, IP María del Mar Gallardo, 144.928 €.
5. 6G-SANDBOX. Supporting Architectural and technological Network evolutions through an intelligent, secured and twinning enabled Open eXperimentation facility, European Commission Grant agreement ID: 101096328, 36 months, 2023-2025, 2.324.000 € Leader of activities in formal methods
6. RFOG. Improving latency and reliability for FOG computing for critical applications, MICINN-Spanish Government, RTI2018-099777-B-I00, 36 months, 2019-2022, 179.000€ , Formal modelling and verification of protocols
7. Affordable 5G, High-tech and affordable 5G network roll-out to every corner, European Commission H2020-ICT-42-2020: 5G PPP – 5G core technologies innovation, Grant Agreement 957317, 24 months, 2020-2022, Atos (Spain), 6,8 M€, (342.000€ UMA). Definition of Automata Learning methods for TSN over 5G
8. EVOLVED 5G, Experimentation and Validation Openness for Long-term evolution of VERTICAL industries in 5G era and beyond, ICT-41-2020 - 5G PPP – 5G innovations for verticals with third party services, 36 months, 2020-2023, Telefonica (Spain), 8M€, 323.000€ UMA). Definition of Automata Learning methods for TSN over 5G
9. 5Genesis. 5th Generation End-to-end Network, Experimentation, System Integration, and Showcasing, European Commission, H2020-ICT-17 5G End to End Facility, Grant Agreement 815178, 42 months, 2018-2021, Demokritos (Greece), 15,8M€, (891.000€ UMA). Formal model and verification of critical components in the project
10. TRIANGLE. 5G applications and devices benchmarking, European Commission. H2020-ICT-12-2015 - Integrating experiments and facilities in FIRE+, Grant Agreement 688712, 36 months, 2016-2018, Keysight Technologies (Belgium), 2,9M€, (608.000€ UMA). Formal model and verification of mobile apps.

Contratos y transferencia,

1. SIGO: Innovative solutions for pre-5G communications, Keysight Technologies (formerly Agilent Technologies), 30 months, 2015-2018, 280.000 €. Task developed: Design of testing methods for Keysight TAP tool.
2. 4Green, Wireless Devices Global Testing and Certification Management System, Keysight Technologies 36 months, 2012- 2014, 357.000€, Task developed: Application of formal methods for 4G applications
3. Development of Technologies and Tools to facilitate the deployment of the new 4G communications networks, AT4 wireless, 48 months, 2009-2012, Pedro Merino Gómez, 1.083.677 €, Task developed: Formal methods for 4G applications
4. Development of a Decision Support System for Dam management, BEFESA-ABENGOA Water-CENIT TECOAGUA, 36 months, 2009-2012, 205.000 €, Task developed: Design of formal models to support automatic decision.

ACTIVIDAD DOCENTE:

A lo largo de los más de 30 años de actividad docente, María del Mar Gallardo ha impartido gran cantidad de asignaturas de grado y posgrado dentro del área Lenguajes y Sistemas Informáticos. Por ejemplo, respecto a las asignaturas de grado ha impartido, entre otras, “Fundamentos de Programación”, “Programación Paralela”, “Programación Concurrente”, “Análisis y diseño de algoritmos”, “Programación de sistemas y Concurrencia”, “Programación Orientada a Objetos”, “Métodos Formales para la Ingeniería del Software” tanto en la ETSI Informática como en la ETSI de Telecomunicación de la Universidad de Málaga. Además, en casi todas ellas, ha sido

coordinadora de la asignatura. Respecto a las asignaturas de posgrado ha impartido la asignatura “Métodos para la construcción de software fiable” el Máster de Ingeniería e Inteligencia Artificial, y “Técnicas Avanzadas de Desarrollo Software” en el Máster de Telemática y Redes de Comunicación, ambos de la Universidad de Málaga.

María del Mar Gallardo ha dirigido más de 100 PFCs, TFGs y TFMs en los dos centros en los que ha impartido docencia. Asimismo, ha participado en varios Proyectos de Innovación docente con los compañeros de asignatura.

Ha dirigido cuatro tesis doctorales. Además, hay una quinta que se va a leer en durante 2024, y otra que está empezando a realizarse.

ACTIVIDADES DE LIDERAZGO (PARA CU):

Como méritos de liderazgo María del Mar Gallardo co-dirige el grupo de investigación MORSE en el Instituto de Tecnologías e Ingeniería del Software de la UMA.

Ha sido y es investigadora principal en tres proyectos nacionales y uno regional:

1. Construcción de gemelos digitales formales para la reconfiguración automática de sistemas complejos. PID2022-142181OB-I00, PI: María del Mar Gallardo, Laura Panizo. Ministerio de Ciencia e Innovación. 94.625,00 €.
2. 5G+TACTILE. 5G+TACTILE_1: network Technologies and new protocols for deterministic over B5G/6G, MINECO-Spanish Government, TSI-063000-2021-11, 36 months, 2022-2024, 920.000€ Co-scientific director
3. DAD-IOT: Construction, Analysis and Deployment of IoT Applications. National project TIN2015-67083-R. PI: Ernesto Pimentel, María del Mar Gallardo. Ministerio de Economía y Competitividad, 77.924 €.
4. Check-it: New extensions of Formal Techniques of for the modelling, verification, synthesis and optimization of embedded systems and mobile communications: Application to LTE protocol certification. Regional Project: P11-TIC-07659, 2013-2015, María del Mar Gallardo, 144.928,00 €.

Ha participado en muchos contratos de investigación con empresas del Parque Tecnológico de Andalucía liderando las actividades relacionadas con el modelado y análisis formal de los sistemas:

1. SIGO: Innovative solutions for pre-5G communications, Keysight Technologies (formerly Agilent Technologies), 30 months, 2015-2018, 280.000 €. Task developed: Design of testing methods for Keysight TAP tool.
2. 4Green, Wireless Devices Global Testing and Certification Management System, Keysight Technologies 36 months, 2012- 2014, 357.000€, Task developed: Application of formal methods for 4G applications
3. Development of Technologies and Tools to facilitate the deployment of the new 4G communications networks, AT4 wireless, 48 months, 2009-2012, Pedro Merino Gómez, 1.083.677 €, Task developed: Formal methods for 4G applications
4. Development of a Decision Support System for Dam management, BEFESA-ABENGOA Water-CENIT TECOAGUA, 36 months, 2009-2012, 205.000 €, Task developed: Design of formal models to support automatic decision.
5. Communication software for mobile networks 3.9G y 4G, AT4 wireless, 10 months, 2008, 122.153 €, Task developed: Modelling and verification with SDL.
6. Research in methodologies for reliable software in communication systems beyond 3G, Cetecom, 24 months, 2006-2008, 290.000 €. Task developed: Modelling and verification with SDL.

Ha liderado las tareas relacionadas con métodos formales de varios proyectos europeos:

1. Affordable 5G, High-tech and affordable 5G network roll-out to every corner, European Commission H2020-ICT-42-2020: 5G PPP – 5G core technologies innovation, Grant Agreement 957317, 24 months, 2020-2022, Atos (Spain), 6,8 M€, (342.000€ UMA). Definition of Automata Learning methods for TSN over 5G
2. EVOLVED 5G, Experimentation and Validation Openness for Long-term evolution of VERTICAL inDustries in 5G era and beyond, ICT-41-2020 - 5G PPP – 5G innovations for verticals with third party services, 36 months, 2020-2023, Telefonica (Spain), 8M€, 323.000€ UMA). Definition of Automata Learning methods for TSN over 5G
3. 5Genesis. 5th Generation End-to-end Network, Experimentation, System Integration, and Showcasing, European Commission, H2020-ICT-17 5G End to End Facility, Grant Agreement 815178, 42 months, 2018-2021, Demokritos (Greece), 15,8M€, (891.000€ UMA). Formal model and verification of critical components in the project
4. TRIANGLE. 5G applications and devices benchmarking, European Commission. H2020-ICT-12-2015 - Integrating experiments and facilities in FIRE+, Grant Agreement 688712, 36 months, 2016-2018, Keysight Technologies (Belgium), 2,9M€, (608.000€ UMA). Formal model and verification of mobile apps.
5. Federation for FIRE (Fed4FIRE), Comisión Europea, FP7- ICT, Grant Agreement Number 318389, 36 meses, 2013-2016, Pedro Merino Gómez, Piet Demeester, iMinds (Bélgica), 11.067.773 Euros
6. Smart Water Management With Integrated DSS (SAID), Comisión Europea, ENV-2013-WATER-INNO-DEMO-1, Grant Agreement Number 619132, 36 meses, 2014-2016, Pedro Merino Gómez, Antonio Linares, Abeinsa BD (España), 3,2 millones de euros

Ha pertenecido y pertenece a varios comités de programa de congresos nacionales e internaciones: FMICS, SPIN, PROLE, ACM SAC, SAS

OTROS MÉRITOS:

María del Mar Gallardo está muy involucrada en los problemas de género en las áreas STEAM. Ha participado en varias mesas redondas y dado conferencias en las que se trataba del problema de la falta de mujeres en las áreas STEAM. En la actualidad forma parte del grupo de profesoras de la Universidad de Málaga responsable del proyecto “comotu” en el que participan alrededor de 120 profesoras y profesionales de la ciencias e ingeniería. El objetivo de este proyecto es visibilizar el papel de la mujer estas áreas dando charlas y talleres en colegios a niños de todas las edades, preferentemente en primaria.

En cuanto a actividades de gestión, María del Mar Gallardo ha sido subdirectora y secretaria de la ETSI de Telecomunicación de la UMA durante 10 años. También fue secretaria del departamento de Lenguajes y Sistemas Informáticos durante dos años.