

Parte A. DATOS PERSONALES

		Fecha del CVA	Mayo 2024
Nombre y apellidos	María del Mar Gallardo Melgarejo		
Núm. identificación del investigador	Researcher ID	G-4371-2014	
	Código Orcid	0000-0003-3481-5307	

A.1. Situación profesional actual

Organismo	Universidad de Málaga		
Dpto./Centro	Lenguajes y Ciencias de la Computación/ETSI Informática		
Dirección	Campus Teatinos, 29071, Málaga		
Teléfono		gallardo@lcc.uma.es	
Categoría profesional	Catedrático de Universidad	Fecha inicio	8-08-2017
Espec. cód. UNESCO			
Palabras clave	Software analysis, formal methods, model based testing, model checking, verification		

A.2. Formación académica (título, institución, fecha)

Licenciatura/Grado/Doctorado	Universidad	Año
Lic. Ciencias (Matemáticas)	Málaga	1989
Doctora en Informática	Málaga	1997

A.3. Indicadores generales de calidad de la producción científica (véanse instrucciones)

Número de sexenios de investigación: 4

Fecha del último concedido: 2019

Número de tesis doctorales dirigidas en los últimos 10 años: 4

Número de quinquenios docentes: 6

Citas totales: 172 (Web of Science), 395 (Scopus), 1086 (Google Scholar)

Índice h: 8 (WoS), 12 (Scopus), 19 (Google Scholar)

Parte B. RESUMEN LIBRE DEL CURRÍCULUM

María del Mar Gallardo Melgarejo es Catedrática de Universidad en la Universidad de Málaga desde julio de 2017. Tiene reconocidos 4 tramos de y 6 quinquenios docentes. Su actividad investigadora se centra en el campo de las técnicas formales para el análisis riguroso de propiedades funcionales y extra-funcionales de software crítico (software concurrente, distribuido y abierto). La mayor parte de los trabajos publicados se caracterizan por contemplar todos los aspectos del problema estudiado, abordando desde las ideas originales, su formalización, la implementación, casos de estudio y evaluación experimental. Hay que destacar la capacidad para compatibilizar el rigor formal necesario en su línea de investigación con la capacidad para convertir las contribuciones en contratos de transferencia de tecnología con empresas como Abengoa, AT4 wireless o Agilent Technologies. Esta actividad investigadora está directamente relacionada con la docencia que imparte en las asignaturas Métodos Formales para la Ingeniería del Software y Programación de Sistemas y Concurrencia, en las que se estudian métodos rigurosos de modelado y análisis de sistemas críticos. Ha dirigido 4 tesis doctorales en el campo de los métodos formales para analizar la corrección de software de aviónica, de software empotrado en el que el tiempo juega un papel importante, software que hace uso de APIs bien definidas escrito en el lenguaje C, y sistemas dirigidos por eventos como es el caso de las apps que se ejecutan en dispositivos móviles.

Parte C. MÉRITOS MÁS RELEVANTES (*ordenados por tipología*)

C.1. 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, Pages 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 [WoS Q3, Scopus Q1]
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 Journal. 29(4-5) (2019)
6. María-del-Mar Gallardo, Pedro Merino, Laura Panizo, Alberto Salmerón. Integrating river basin DSSs with model checking. Int J Softw Tools Technol Transfer STTT 20(5): 499-514 (2018) (JCR)
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. [JCR (2015) Computer Networks and Communications, 50/219: 2,19 **Q1**, Computer Science Applications 116/498: 2,19 **Q1**]
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), [JCR (2015) Theoretical Computer Science, 63/118: 0,95, **Q3**]
9. María-del-Mar Gallardo, David Sanán: Verification of complex dynamic data tree with mu-calculus. Automatic Software Engineering 20(4): 569-612 (2013) [JCR (2014) Computer Science, Software Engineering 15/104: 1.733, **Q1**; JCR (2013) Computer Science, Software Engineering 34/105: 1.240, **Q2**]
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) [JCR (2014) Computer Science, Soft Engineering 35/104: 1,348, **Q2**]
11. Damián Adalid, Alberto Salmerón, María-del-Mar Gallardo, Pedro Merino: Using SPIN for automated debugging of infinite executions of Java programs. Journal of Systems and Software 90: 61-75 (2014) [JCR (2013) Computer Science, Software Engineering 33/105: 1.245, **Q2**]

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

C.3. Proyectos de investigación

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 €.
5. 6G-SANDBOX. Supporting Architectural and technological Network evolutions through an intelligent, secureD and twinning enaBled Open eXperimentation facility, European Comission 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.

C.4. 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.
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.