

CV Date

02/06/2022

## Part A. PERSONAL INFORMATION

|                                            |                                                                                 |               |            |
|--------------------------------------------|---------------------------------------------------------------------------------|---------------|------------|
| First Name                                 | Adrián                                                                          |               |            |
| Family Name                                | Riesco Rodríguez                                                                |               |            |
| Sex                                        | Male                                                                            | Date of Birth | 04/10/1982 |
| ID number Social Security, Passport        | 50755880-D                                                                      |               |            |
| URL Web                                    | <a href="http://maude.sip.ucm.es/~adrian/">http://maude.sip.ucm.es/~adrian/</a> |               |            |
| Email Address                              | ariesco@ucm.es                                                                  |               |            |
| Open Researcher and Contributor ID (ORCID) | 0000-0002-9716-4612                                                             |               |            |

### A.1. Current position

|                     |                                                                               |              |                    |
|---------------------|-------------------------------------------------------------------------------|--------------|--------------------|
| Job Title           | Profesor Titular de Universidad                                               |              |                    |
| Starting date       | 2022                                                                          |              |                    |
| Institution         | Universidad Complutense de Madrid                                             |              |                    |
| Department / Centre | Departamento de Sistemas Informáticos y Computación / Facultad de Informática |              |                    |
| Country             |                                                                               | Phone Number | (+34) 91394 - 7648 |
| Keywords            |                                                                               |              |                    |

## Part B. CV SUMMARY

1. Scientific contribution. I have worked mainly on formal methods in rewriting logic, meta-programming, theorem proving, symbolic biological systems, debugging, testing and on analysis of emerging technologies, such as Apache Flink/Spark or sentiment analysis on Twitter. Considering the results of this research from 2012, I have been published in more than 40 peer-reviewed journals and conferences, including 16 JCR-indexed journals (12 of them Q1/Q2). In all these lines I have collaborated with 38 other researchers, both nationally and internationally, and including both academia and industry. In particular, some of the articles presented are the result of international stays at the German Institute for Artificial Intelligence (DFKI) and the Japan Advanced Institute of Science and Technology (JAIST), where I have stayed for more than 10 months. According to the data in Google Scholar, I have been cited 606 times and I have an h-index of 13 and an i-index of 18 in total, being the data for the last five years 257 cites, an h-index of 8 and an i-index of 6 (data for the last 10 years is not available). I have 1 six-year terms of research (sexenios).

I detail below the most relevant works in the scope of the project:

- Program verification. I have worked on system analysis using both static analysis techniques and slicing as model checking and theorem provers. In particular, I have combined static analysis and meta-programming to define general analysis frameworks parameterized by the semantics of the target language. I have used the model checker integrated in Maude to verify agent systems, mobile systems, network protocols and distributed applications. I have also worked in debugging and testing parameterized by the semantics. Finally, I have developed different theorem provers, automatized them with semi-automatic proof generation, and used them to verify multiple protocols.
- Debugging and testing. In my thesis I worked on the declarative debugging paradigm for rewriting logic. Later, I worked in this paradigm for other languages such as Java and Erlang, taking parallelism into account and combining the debugging phase with the testing phase, which improved both stages.
- Analysis of streaming systems. Streaming systems enable constant data transmission, making possible applications in the realm of the internet of things (where massive data is received from a myriad of small devices, including everything from robot sensors and autonomous cars to smart home devices) and social networks, among others. The challenge

with this type of development is its integration within a theoretical framework, as these are real environments with unbounded information.

In addition, I have been part of the program committee of 15 conferences, chair of two congresses and one conference, editor of three special journal issues and reviewer for multiple conferences and journals. In the last 10 years I have been part of 7 research projects.

## 2. Dissemination activities, collaboration with industry and the private sector

Besides this scientific contributions, we have presented part of our work in more industrial settings, including Apache Big Data Europe 2016 and at the Scala MeetUp in Madrid (ScalaMad). I am co-author of a book on Python for Big Data.

## 3. Constitution of research teams

I was the main researcher of the Santander-UCM project PR26/16-21B-2 (with a budget of 8200 € and a duration of 2 years).

## 4. Other merits

As a teacher, I have taught multiple subjects in the Computer Science and Mathematics faculties, as well as in the Masters in Computer Engineering, in which I teach verification techniques in the subject "Audit, Quality and Reliability" since its implementation, and in Formal Methods for Computer Engineering, inter-university master's degree in which I have taught specification using rewriting techniques in "Theory of Programming Languages". I have also tutored more than 30 undergraduate and master's degree theses. In addition, I have been rated as an "excellent" teacher in the last two three-yearly calls of the Docentia program. I coordinate the Master in Computer Engineering.

More information is available at <http://maude.sip.ucm.es/~adrian/>.

# Part C. RELEVANT ACCOMPLISHMENTS

## C.1. Most important publications in national or international peer-reviewed journals, books and conferences

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 **Scientific paper**. Rafael Caballero Roldán; Enrique Martín Martín; (AC); Salvador Tamarit. (3/4). 2018. Declarative Debugging of Concurrent Erlang Programs; Journal of Logical and Algebraic Methods in Programming. 101, pp.22-41. ISSN 1567-8326. <https://doi.org/10.1016/j.jlamp.2018.07.005>
- 2 **Scientific paper**. (AC); Adrián Riesco Rodríguez. (1/2). 2018. Prove it! Inferring Formal Proof Scripts from CafeOBJ Proof Scores ACM Transactions on Software Engineering and Methodology. ACM. 27-2, pp.1-32. ISSN 1049-331X. <https://doi.org/10.1145/3208951>
- 3 **Scientific paper**. Irina Mariuca Asavoae; Mihail Asavoae; (AC). (3/3). 2018. Slicing from Formal Semantics Chisel: a Tool for Generic Program Slicing International Journal on Software Tools for Technology Transfer. Springer. 20-6, pp.739-769. ISSN 1433-2779. <https://doi.org/10.1007/s10009-018-0500-y>
- 4 **Scientific paper**. Rafael Caballero Roldán; Adrián Riesco Rodríguez; Josep Silva. (2/3). 2017. A Survey of Algorithmic Debugging ACM Computing Surveys. ACM. 50-4, pp.1-35. ISSN 0360-0300. <https://doi.org/10.1145/3106740>
- 5 **Scientific paper**. (AC); Kazuhiro Ogata; Adrián Riesco Rodríguez. (1/3). 2017. A Maude environment for CafeOBJ Formal Aspects of Computing. Springer. 29-2, pp.309-334. ISSN 0934-5043. <https://doi.org/10.1007/s00165-016-0398-7>

- 6 **Scientific paper.** Rafael Caballero Roldán; Enrique Martín Martín; Adrián Riesco Rodríguez; Salvador Tamarit. (3/4). 2015. A Zoom-Declarative Debugger for Sequential Erlang Programs *Science of Computer Programming*. Elsevier. 110, pp.104-118. ISSN 0167-6423. <https://doi.org/10.1016/j.scico.2015.06.011>
- 7 **Scientific paper.** Rafael; Enrique; Adrián; Salvador. (3/4). 2021. A unified framework for declarative debugging and testing *Information & Software Technology*. Elsevier. 129, pp.106427-106441. <https://doi.org/10.1016/j.infsof.2020.106427>
- 8 **Scientific paper.** R. Caballero; E. Martin-Martin; A. Riesco; S. Tamarit. 2019. A core Erlang semantics for declarative debugging *Journal of Logical and Algebraic Methods in Programming*. Elsevier. 107, pp.1-37. <https://doi.org/10.1016/j.jlamp.2019.05.002>
- 9 **Scientific paper.** A. Riesco; J. Rodriguez-Hortala. 2019. Property-Based Testing for Spark Streaming *Theory and Practice of Logic Programming*. Cambridge University Press. 19-4, pp.574-602. <https://doi.org/10.1017/S1471068419000012>
- 10 **Scientific paper.** José Luis Brita-Paja Segoviano; Carlos Gregorio Rodríguez; Luis Fernando Llana Díaz; Cristóbal Pareja Flores; (AC). (5/5). 2019. Introducing MOOC-like methodologies in a face-to-face undergraduate course: a detailed case study *Interactive Learning Environments*. Routledge. 27-1, pp.15-32. ISSN 1049-4820. <https://doi.org/10.1080/10494820.2018.14513453>
- 11 **Scientific paper.** Adrián Riesco Rodríguez. (1/1). 2018. Model checking parameterized by the semantics in Maude *Lecture Notes in Computer Science*. Springer. 10818, pp.198-213. ISSN 0302-9743. [https://doi.org/10.1007/978-3-319-90686-7\\_13](https://doi.org/10.1007/978-3-319-90686-7_13)
- 12 **Scientific paper.** Irina Mariuca Asavae; Mihail Asavae; Adrián Riesco Rodríguez. (3/3). 2018. Context-Updates Analysis and Refinement in Chisel *Lecture Notes in Computer Science*. 10869, pp.328-346. ISSN 0302-9743. [https://doi.org/10.1007/978-3-319-94111-0\\_19](https://doi.org/10.1007/978-3-319-94111-0_19)
- 13 **Scientific paper.** Adrián Riesco Rodríguez. (1/). 2018. MUnit: A Unit testing framework for Maude *Lecture Notes in Computer Science*. Springer. 11152, pp.45-58. ISSN 0302-9743. [https://doi.org/10.1007/978-3-319-99840-4\\_3](https://doi.org/10.1007/978-3-319-99840-4_3)
- 14 **Scientific paper.** Kazuhiro Ogata; Adrián Riesco Rodríguez. (1/2). 2017. A Formal Proof Generator from Semi-formal Proof Documents *Lecture Notes in Computer Science*. Springer. 10580, pp.3-12. ISSN 0302-9743. [https://doi.org/10.1007/978-3-319-67729-3\\_1](https://doi.org/10.1007/978-3-319-67729-3_1)
- 15 **Scientific paper.** Isabel Pita Andreu; Adrián Riesco Rodríguez. (2/2). 2015. Specifying and Analyzing the Kademlia Protocol in Maude *Lecture Notes in Computer Science*. Springer. 9399, pp.524-541. ISSN 0302-9743. [https://doi.org/10.1007/978-3-319-25150-9\\_30](https://doi.org/10.1007/978-3-319-25150-9_30)
- 16 **Scientific paper.** Adrian Riesco. (1/1). 2014. Using big-step and small-step semantics in Maude to perform declarative debugging *Lecture Notes in Computer Science*. Springer. 8475, pp.52-68. ISSN 0302-9743. [https://doi.org/10.1007/978-3-319-07151-0\\_4](https://doi.org/10.1007/978-3-319-07151-0_4)

## C.2. Conferences and meetings

Adrian Riesco. Declarative Debugging: Past, Present and Future. SEKE 2021 : International Conference on Software Engineering and Knowledge Engineering. 2022. United States of America. Participatory - invited/keynote talk.

## C.3. Research projects and contracts

- 1 **Project.** ProCode-UCM: MÉTODOS RIGUROSOS PARA EL DESARROLLO DE SISTEMAS SOFTWARE DE CALIDAD Y FIABILIDAD CERTIFICADAS (PID2019-108528RB-C22). Ministerio de Ciencia, Innovación y Universidades. 01/06/2020-31/05/2024. 209.088 €.
- 2 **Project.** BLOQUES-CM: Contratos Inteligentes y Blockchains Escalables y Seguros mediante Verificación y Análisis (P2018/TCS-4339). Comunidad de Madrid. 01/01/2019-31/12/2022.

- 3 **Project.** Tecnologías y herramientas para el desarrollo de software consciente de los recursos, correcto y eficiente.. FONDO EUROPEO DE DESARROLLO REGIONAL; Ministerio de economía y competitividad. Narciso Martí Oliet. 01/01/2016-31/12/2019. 182.226 €.
- 4 **Project.** PR26/16-21B-2 - ¿Nos dirigimos hacia una sociedad desintermediada? Un estudio de la participación social mediante análisis de redes, big data y aprendizaje automático.. Banco Santander; Universidad Complutense de Madrid. Adrián Riesco. 22/12/2016-21/12/2018. 8.200 €.