Date of the CV	7th March 2025

Part A. PERSONAL INFORMATION

First Name	Miriam	Family Name	García Soto
URL Web	https://miriamgar.github.io/		
E-mail	miriam.garcia.soto@gmail.com		
Researcher's identification number	ORCID	0000-0003-2936-5719	
	Scopus Author ID	57219769619	

A.1. Current position

Job Title	Assistant Professor		
Starting date	6th September 2024		
Institution	Universidad Complutense de Madrid		
Department / Center	Software Systems and Computation / Faculty of Computer Science		
Country	Spain	Phone Number	(+34) 913 94 76 48
Keywords	Information technology - Formal methods - Control theory Verification and synthesis of hybrid automata		

A.2. Previous positions

Period	Job Title / Name of Employer / Country
2022 - 2024	MSCA-UNA4CAREER Post-doctoral Researcher at Universidad Complutense de Madrid, Spain
2018 - 2021	Post-doctoral researcher at Institute of Science and Technology Austria **Maternity leave** from May 2019 to February 2020
2012 - 2018	Assistant Researcher at IMDEA Software Institute, Spain
2012 - 2012	Assistant Researcher at University of L'Aquila, Italy
2008 - 2009	Assistant Researcher at Universidad Politécnica de Madrid, Spain
2006 - 2008	Indra Sistemas, S.A · ACNielsen · SIPSA S.A., Spain

A.3. Education

Degree / Master / PhD	University / Country	Year
PhD in Software and Systems	Universidad Politécnica de Madrid, Spain	2017
Master of Applied Mathematics	University of L'Aquila, Italy & University of Hamburg, Germany	2012
Remote Sensing by Satellite	Universidad Politécnica de Madrid, Spain	2008
Surveying and Observation New Systems related to Meteorology and Climatology	Universitat de València, Spain	2007
Teaching Certificate	Universidad Complutense de Madrid, Spain	2007
Licenciada en Matemáticas	Universidad Complutense de Madrid, Spain	2006

A.4. General quality indicators of scientific production

- **2 journal** publications and **13 papers** in peer-reviewed international conferences.
- **1** journal publication in **Q1** according to **JCR** and **4** conference papers in **CORE** ranking **A*** and **1** in **CORE** ranking **A**.
- Google scholar » citations: 175 | h-index: 9 | i10-index: 6.
- MSCA-COFUND - **UNA4CAREER**-2020-1 **fellowship**.
- **Maria Zambrano** 2021 **grant** - declined.

- **2 seals of excellence** for project proposals under the Horizon 2020's Marie Sklodowska-Curie actions call H2020-MSCA-IF-2018 and H2020-MSCA-IF-2020.
- Graduated **Summa Cum Laude**.
- **Extraordinary PhD award** from Universidad Politécnica de Madrid.
- **International Mention** in the Doctoral Diploma.
- **Research stay scholarship** (4 months) from Spanish Ministry of Economy and Competitiveness.
- **Selected and granted** attendee of the Summer School Marktoberdorf 2013.
- **FPI scholarship** from Spanish Ministry of Economy.
- **Erasmus Mundus scholarship** from European Commission.

Part B. SUMMARY OF THE CURRICULUM

My name is Miriam García Soto. I received my degree in Mathematics from the Complutense University of Madrid in 2006. After working for a research project with Technical University of Madrid and Boeing company, I was awarded an Erasmus Mundus scholarship for an MSc on Mathematical Modelling in Engineering. I received my MSc degree in July 2012 with a grade of 104 over 110. Then, I started working at the IMDEA Software Institute in Spain as a research assistant under the supervision of Prof. Pavithra Prabhakar. I obtained an **FPI scholarship** BES-2013-065076 from the Spanish Ministry of Economy and Competitiveness (MINECO) for the development of a theoretical framework and a methodology for the verification of stability of hybrid systems and the implementation of the proposed theoretical results. This work was also funded by an **UE-MC-FP7** project. The thesis, defended on July 2017, deserved the **Summa Cum Laude** qualification, the **international doctor distinction** and the **extraordinary PhD award** from Technical University of Madrid (UPM). Moreover, the PhD thesis produced **7 peer-reviewed papers** (2 CORE ranking A*, 1 CORE ranking A and 1 invited paper) covering the theoretical results, the developed algorithmic techniques, the experiments illustrating such techniques and the description of a **software tool** called AVERIST. During this period, I was also awarded a **mobility grant** EEBB-I-16-10569 from MINECO to Kansas State University for a period of 4 months. This research stay resulted into a paper (CORE ranking A) and the preparation for a series of lectures on "Verification Techniques for Hybrid Systems", included in the International School on Tool-based Rigorous Engineering of Software Systems (STRESS), October 2016. I have also obtained 3 travel grants for attending international workshops and 2 grants for summer schools such as the internationally recognized Summer School Marktoberdorf.

In February 2018, I moved to the Institute of Science and Technology (IST) Austria as a postdoctoral researcher in the group of Prof. Thomas A. Henzinger, where I worked until the end of 2021. There, I **led a research project** focused on the formal synthesis of hybrid automata from time-series data. I **supervised** a student with a first PhD-year project and worked in collaboration with Dr. Christian Schilling. During this period, despite an 8 months maternity leave, I published **6 peer-review papers** in the IFAC journal of Nonlinear Analysis: Hybrid Systems (JCR Q1) and in top-tier conferences such as the International Conference on Computer-Aided Verification and the Real-Time Systems Symposium (CORE ranking A*). I also obtained two **seals of excellence** for project proposals under the Horizon 2020's Marie Sklodowska-Curie actions call H2020-MSCA-IF-2018 and H2020-MSCA-IF-2020. At the beginning of 2022, I became an MSCA fellow at Universidad Complutense de Madrid under the program **UNA4CAREER** and later, on 2024, got an assistant professorship position.

During my academic life (approx. 8 years) I have attended 9 international conferences, 5 international workshops and 4 international summer schools. I have participated in 5 research projects. All my publications have a low number of co-authors. My high international mobility and scientific production show my leadership and capabilities to perform independent research.

Part C. RELEVANT MERITS

C.1. Publications

The authors in most of my publications are in alphabetical order. Note that at the beginning of my career, both my PhD advisor and dblp administrators considered my surname to be *Soto* instead of *García Soto*.

1. **Synthesis of Parametric Hybrid Automata from Time Series**. Miriam García Soto, Thomas A. Henzinger and Christian Schilling. *International Symposium on Automated Technology for Verification and Analysis* (ATVA), LNCS 13505, 337–353, 2022. DOI: 10.1007/978-3-031-19992-9_22. Acceptance rate: 32% | CORE ranking B.
2. **Synthesis of hybrid automata with affine dynamics from time-series data**. Miriam García Soto, Thomas A. Henzinger and Christian Schilling. *ACM International Conference on Hybrid Systems: Computation and Control* (HSCC), 2:1–2:11, 2021. DOI: 10.1145/3447928.3456704. Acceptance rate: 35%.
3. **Hybridization for Stability Verification of Nonlinear Switched Systems**. Miriam García Soto and Pavithra Prabhakar. *IEEE Real-Time Systems Symposium* (RTSS), to appear, 2020. DOI: 10.1109/RTSS49844.2020.00031. Acceptance rate: 20% | CORE ranking A*.
4. **Abstraction Based Verification of Stability of Polyhedral Switched Systems**. Miriam García Soto and Pavithra Prabhakar. *IFAC journal of Nonlinear Analysis: Hybrid Systems* (NAHS), 36, 100856–100856, 2020. DOI: 10.1016/j.nahs.2020.100856. JCR Q1 in Applied Mathematics & Automation and Control Systems.
5. **Membership-Based Synthesis of Linear Hybrid Automata**. Miriam García Soto, Thomas A. Henzinger, Christian Schilling and Luka Zeleznik. *International Conference on Computer-Aided Verification* (CAV), LNCS 11561, 297–314, 2019. DOI: 10.1007/978-3-030-25540-4_16. Acceptance rate: 25% | CORE ranking A*.
6. **Averist: Algorithmic Verifier for Stability of Linear Hybrid Systems**. Miriam García Soto and Pavithra Prabhakar. *International Conference on Hybrid Systems: Computation and Control* (HSCC), 259–264, 2018. DOI: 10.1145/3178126.3178154. Acceptance rate: 48% | Software tool Averist at https://software.imdea.org/projects/averist/.
7. **Formal Synthesis of Stabilizing Controllers for Switched Systems**. Pavithra Prabhakar and Miriam García Soto. *International Conference on Hybrid Systems: Computation and Control* (HSCC), 111–120, 2017. DOI: 10.1145/3049797.3049822. Acceptance rate: 39%.
8. **Counterexample Guided Abstraction Refinement for Stability Analysis**. Pavithra Prabhakar and Miriam García Soto. *International Conference on Computer-Aided Verification* (CAV), LNCS 9779, 495–512, 2016. DOI: 10.1007/978-3-319-41528-4_27. Acceptance rate: 25% | CORE ranking A*.
9. **An Algorithmic Approach to Global Asymptotic Stability Verification of Hybrid Systems**. Pavithra Prabhakar and Miriam García Soto. *International Conference on Embedded Software* (EMSOFT), 9, 1–10, 2016. DOI: 10.1145/2968478.2968483. Overall acceptance rate: 28% | CORE ranking A.
10. **Hybridization for Stability Analysis of Switched Linear Systems**. Pavithra Prabhakar and Miriam García Soto. *International Conference on Hybrid Systems: Computation and Control* (HSCC), 71–80, 2016. DOI: 10.1145/2883817.2883840. Acceptance rate: 47%.
11. **Foundations of Quantitative Predicate Abstraction for Stability Analysis of Hybrid Systems**. Pavithra Prabhakar and Miriam García Soto. *International Conference on Verification, Model Checking, and Abstract Interpretation* (VMCAI), LNCS 8931, 318–335, 2015. DOI: 10.1007/978-3-662-46081-8_18. Acceptance rate: 45% | CORE ranking B, GGS Class 2.
12. **An algorithmic approach to stability verification of polyhedral switched systems**. Pavithra Prabhakar and Miriam García Soto. *Americal Control Conference* (ACC), 2318–2323, 2014. DOI: 10.1109/ACC.2014.6859056. *Invited paper*.

13. **Abstraction based Model-Checking of Stability of Hybrid Systems**. Pavithra Prabhakar and Miriam García Soto. *International Conference on Computer-Aided Verification* (CAV), LNCS 8044, 280–295, 2013. DOI: 10.1007/978-3-642-39799-8_20. Acceptance rate: 33% | CORE ranking A*.

C.2. Conferences and meetings

1. **[talk]** Diseño, verificación y síntesis de sistemas híbridos. FADoSS seminar, Universidad Complutense de Madrid, 06/02/2023.
2. **[talk]** Design, Verification and Synthesis of Hybrid Systems. Future Female Faculty, Delft University, 16/11/2022.
3. **[author, speaker]** International Symposium on Automated Technology for Verification and Analysis (ATVA) 2022.
4. **[talk]** Design, Verification and Synthesis of Hybrid Systems. VeriDis seminar, INRIA, 12/03/2021.
5. **[author, speaker]** International Conference on Hybrid Systems: Computation and Control (HSCC) 2021.
6. **[author, speaker]** IEEE Real-Time Systems Symposium (RTSS) 2020.
7. **[attendee]** 30th International Conference on Computer Aided Verification International Conference on Hybrid Systems: Computation and Control (CAV) 2018.
8. **[author, speaker]** International Conference on Hybrid Systems: Computation and Control (HSCC) 2018.
9. **[author, speaker, demo]** International Conference on Hybrid Systems: Computation and Control (HSCC) 2017.
10. **[author, speaker, poster]** International Conference on Embedded Software (EMSOFT) 2016.
11. **[poster, granted]** ACM-W second womENcourage Celebration of Women in Computing (womENcourage) 2015.
12. **[attendee]** Formal Modeling and Analysis of Timed Systems (FORMATS) 2015.
13. **[attendee]** 27th International Conference on Computer Aided Verification (CAV) 2015.
14. **[author]** 25th International Conference on Computer Aided Verification (CAV) 2013.

C.3. Research projects

1. **SynthHS**: Synthesis of hybrid systems from multimodal datasets.
   UNA4CAREER-2020-1 (Ref. 847635). 15/04/2022-14/04/2025. 173.628 €.
   Main Researcher: Miriam García Soto, Universidad Complutense de Madrid.
2. **Formal methods for the design and analysis of complex systems**.
   Wittgenstein award from Austrian Science Fund (FWF) (Ref. Z211). 01/01/2014-30/06/2021. 1.500.000 €.
   Main Researcher: Thomas A. Henzinger, IST Austria.
3. **RISCO**: Tecnologías Rigurosas para el Análisis y Verificación de Software Concurrente y Distribuido Sofisticado. Ministerio de Economía, Industria y Competitividad (Ref. TIN2015-71819-P). 01/01/2016-31/01/2018 €.
   Main Researcher: Pierre Ganty, IMDEA Software Institute.
4. **Strongsoft**: Sound Technologies for Reliable, Open, New Generation SOFTware.
   MINECO (Ref. TIN2012-39391-01). 01/01/2013-30/06/2017. 133.000 €.
   Main Researcher: Gilles Barthe, IMDEA Software Institute.
5. **VeriStab**: Formal Verification of Stability of Embedded Control Systems.
   UE-MC-FP7 (Ref. 631622). 01/03/2014-15/08/2015. 100.000 €.
   Main Researcher: Pavithra Prabhakar, IMDEA Software Institute.

C.5. Stays in public or private R&D centres

1. **[Post-doctoral]** IST Austria, Henzinger Group. Klosterneuburg, Austria. 15/02/2018-31/12/2021.
2. **[Doctoral]** Kansas State University, Department of Computing and Information Sciences. Kansas, United States of America. 05/02/2016-31/05/2016.

C.6. Workshops and seminars attended

1. **[attendee]** 12th Alpine Verification Meeting (AVM) 2018.
2. **[speaker]** Dagstuhl Seminar on Robustness in Cyber-Physical Systems (Dagstuhl) 2016.
3. **[demo]** 4th International Workshop on Hybrid Systems Biology (HSB) 2015.
4. **[author, speaker]** 1st International Workshop on Symbolic and Numerical Methods for Reachability Analysis (SNR) 2015.
5. **[attendee]** Verification Mentoring Workshop (VMW) 2015.
6. **[attendee]** 2nd SIGPLAN Programming Languages Mentoring Workshop (PLMW) 2013.

C.7. Summer schools

1. **[lecturer]** 4th International School on Tool-based Rigorous Engineering of Software Systems (ISOLA) 2016.
2. **[attendee]** 5th annual SAT/SMT Summer School (SAT/SMT) 2015.
3. **[granted]** Summer School Marktoberdorf on Software Systems Safety (Marktoberdorf) 2013.
4. **[poster, granted]** Summer School on Cyber-Physical Systems (CPS) 2013.
5. **[attendee]** Intensive Programme on Fluid Dynamics Turns to Biology (Fluid2Bio) 2012.

C.8. R&D management and participation in scientific committees

1. **Artifact Evaluation Committee Member** of the 22nd International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI), Jan 2021.

2. **Program Committee Member** of the

   - 8th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS), July 2024.
   - 21st International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS), September 2023.
   - 29th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), May 2023.
   - 29th International Symposium on Model Checking of Software (SPIN), April 2023.
   - 15th International Workshop on Numerical Software Verification (NSV), August 2022.
   - 34th International Conference on Computer Aided Verification (CAV), August 2022.
   - 22nd & 25th ACM International Conference on Hybrid Systems: Computation and Control (HSCC), April 2019 & May 2022.
   - 42nd IEEE Real-Time Systems Symposium (RTSS), December 2021.
   - 3rd Workshop on Design and Analysis of Robust Systems (DARS), April 2018.

3. **Reviewer** in

   - IFAC Journal Automatica 2023.
   - IEEE Conference on Decision and Control (CDC) 2018-2020.
   - Euromicro Conference on Digital System Design (DSD) 2018 and
   - International Conference on Software Engineering and Formal Methods (SEFM) 2018.
   - International Conference on Formal Modeling and Analysis of Timed Systems (FORMATS) 2017.
   - IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS) 2017.
   - International Conference on Quantitative Evaluation of Systems (QEST) 2017.
   - Summer Computer Simulation Conference (SCSC) 2017.
   - International Conference on Computer-Aided Verification (CAV) 2016.
   - NASA Formal Methods Symposium (NFM) 2016.