

Miriam García Soto

Madrid, Spain
(+34) 670 53 13 28
miriam.garcia.soto@gmail.com
<https://miriamgar.github.io>

Education

- 2012 – 2017 **PhD in Software and Systems** - [Grant from Spanish Ministry of Economy and Competitiveness](#)
Automatization of stability analysis for hybrid systems
IMDEA Software Institute - Advisor: Pavithra Prabhakar (KSU) - Extraordinary PhD thesis award by UPM
[Research stay](#) at *Kansas State University* - *Computer Science*
- 2010 – 2012 **Master of Applied Mathematics** - [Erasmus Mundus scholarship from EACEA, European Commission](#)
Mathematical Modelling in Engineering: Theory, Numerics, Applications
Università degli Studi dell' Aquila and Universität Hamburg
- 2007 – 2008 **Postgraduate Degree**
Remote Sensing by Satellite
Universidad Politécnica de Madrid
- 2007 **Teaching Certificate**
Universidad Complutense de Madrid
- 2007 **Postgraduate Degree**
Surveying and Observation New Systems related to Meteorology and Climatology
Universitat de València
- 2004 – 2005 **ERASMUS European Exchange Program** - [Scholarship from Spanish Ministry of Education](#)
Universiteit van Amsterdam & Vrije Universiteit Amsterdam
- 1997 – 2004 **Licentiate Degree**
Mathematics
Universidad Complutense de Madrid

Work experience

- Researcher** at *Universidad Complutense de Madrid* 2022 – present
Synthesis of hybrid systems from multimodal datasets
H2020-MSCA-COFUND-2018 - UNA4CAREER postdoctoral fellowship
- Postdoctoral researcher** at *Institute of Science and Technology Austria* 2018 – 2021
Inference of Hybrid Systems - Advisor: Thomas A. Henzinger
- Maternity leave** from May 2019 to February 2020
- Assistant researcher** at *CCBC (UAQ)* 2012
Computational Biochemistry
- Assistant researcher** at *GPDS-Ceditec (UPM)* 2008 – 2010
Air Traffic Management
- Systems Junior Engineer** at *Indra* 2007 – 2008
Insurance Business Systems
- Mathematician** at *ACNielsen* 2006 – 2007
Marketing Research
- PL/SQL Programmer** at *MAPFRE* 2006
Business Informatics

Programmer at SIPSA S.A. <i>Software Creation</i>	2005 – 2006
Private Mathematics teacher <i>Education</i>	1999 – 2004

Honors and awards

H2020-MSCA-COFUND-2018 - UNA4CAREER postdoctoral fellowship	2021
Extraordinary PhD thesis award from UPM	2018
Research stay scholarship from Spanish Ministry of Economy and Competitiveness	2016
Travel grant for womENcourage	2015
Travel grant for VMW	2015
Selected and granted attendee of the Summer School Marktoberdorf	2013
Travel grant for PLMW	2013
Summer School on Cyber-Physical Systems grant	2013
FPI scholarship from Spanish Ministry of Economy	2012
Erasmus Mundus scholarship from European Commission	2010
Erasmus scholarship from Spanish Ministry of Education	2004

Research projects

Formal methods for the design and analysis of complex systems Wittgenstein award from Austrian Science Fund (FWF) (Ref. Z211) <i>Main Researcher:</i> Thomas A. Henzinger, IST Austria	2014 – 2021
Strongsoft: Sound Technologies for Reliable, Open, New Generation SOFTWARE MINECO (Ref.: TIN2012-39391-01) <i>Main Researcher:</i> Gilles Barthe, IMDEA Software Institute	2013 – 2017
VeriStab: Formal Verification of Stability of Embedded Control Systems UE-MC-FP7 (Ref.: 631622) <i>Main Researcher:</i> Pavithra Prabhakar, IMDEA Software Institute	2014 – 2016

Publications

[17] 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 2022
[16] Synthesis of Hybrid Automata with Affine Dynamics from Time-Series Data Miriam García Soto, Thomas A. Henzinger and Christian Schilling. * International Conference on Hybrid Systems: Computation and Control.	HSCC 2021
[15] Hybridization for Stability Verification of Nonlinear Switched Systems Miriam García Soto and Pavithra Prabhakar. IEEE Real-Time Systems Symposium.	RTSS 2020
[14] Abstraction Based Verification of Stability of Polyhedral Switched Systems Miriam García Soto and Pavithra Prabhakar. Nonlinear Analysis: Hybrid Systems, IFAC journal.	NAHS 2020
[13] Formal Synthesis of Stabilizing Controllers for Periodically Controlled Linear Switched Systems Atreyee Kundu, Miriam García Soto, and Pavithra Prabhakar. Indian Control Conference Proceedings, IEEE.	ICC 2019

- [12] **Membership-Based Synthesis of Linear Hybrid Automata** CAV 2019
 Miriam García Soto, Thomas A. Henzinger, Christian Schilling, and Luka Zeleznik. *
 International Conference on Computer-Aided Verification.
- [11] **Averist: Algorithmic Verifier for Stability of Linear Hybrid Systems** HSCC 2018
 Miriam García Soto and Pavithra Prabhakar.
 International Conference on Hybrid Systems: Computation and Control.
- [10] **Formal Synthesis of Stabilizing Controllers for Switched Systems** HSCC 2017
 Pavithra Prabhakar and Miriam García Soto.*
 International Conference on Hybrid Systems: Computation and Control.
- [9] **Counterexample Guided Abstraction Refinement for Stability Analysis** CAV 2016
 Pavithra Prabhakar and Miriam García Soto.*
 International Conference on Computer-Aided Verification.
- [8] **An Algorithmic Approach to Global Asymptotic Stability Verification of Hybrid Systems** EMSOFT 2016
 Pavithra Prabhakar and Miriam García Soto.*
 International Conference on Embedded Software.
- [7] **Hybridization for Stability Analysis of Switched Linear Systems** HSCC 2016
 Pavithra Prabhakar and Miriam García Soto.*
 International Conference on Hybrid Systems: Computation and Control.
- [6] **Verification Techniques for Hybrid Systems** ISOLA 2016
 Pavithra Prabhakar, Miriam García Soto and Ratan Lan.
 International Symposium on Leveraging Applications of Formal Methods, Verification and Validation
- [5] **AVERIST: An Algorithmic Verifier for Stability** NSV 2015
 Pavithra Prabhakar and Miriam García Soto.*
 International Workshop on Numerical Software Verification.
- [4] **An Algorithmic Approach to Stability Verification of Hybrid Systems: A Summary** SNR 2015
 Pavithra Prabhakar and Miriam García Soto.*
 International Workshop on Symbolic and Numerical Methods for Reachability Analysis.
- [3] **Foundations of Quantitative Predicate Abstraction for Stability Analysis of Hybrid Systems** VMCAI 2015
 Pavithra Prabhakar and Miriam García Soto.*
 International Conference on Verification, Model Checking, and Abstract Interpretation.
- [2] **An algorithmic approach to stability verification of polyhedral switched systems** ACC 2014
 Pavithra Prabhakar and Miriam García Soto.*
 American Control Conference.
- [1] **Abstraction based Model-Checking of Stability of Hybrid Systems** CAV 2013
 Pavithra Prabhakar and Miriam García Soto.*
 International Conference on Computer-Aided Verification.

* : alphabetical order

Conferences attended

- HSCC 2021 **International Conference on Hybrid Systems: Computation and Control** [author, speaker]
- RTSS 2020 **IEEE Real-Time Systems Symposium** [author, speaker]
- CAV 2018 **30th International Conference on Computer Aided Verification**
- HSCC 2018 **International Conference on Hybrid Systems: Computation and Control** [author, speaker]
- HSCC 2017 **International Conference on Hybrid Systems: Computation and Control** [author, speaker, demo]
- EMSOFT 2016 **International Conference on Embedded Software** [author, speaker, poster]
- womENCourage 2015 **ACM-W second womENCourage Celebration of Women in Computing** [poster, granted]
- FORMATS 2015 **Formal Modeling and Analysis of Timed Systems**
- CAV 2015 **27th International Conference on Computer Aided Verification**
- CAV 2013 **25th International Conference on Computer Aided Verification** [author]

Workshops and seminars attended

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

Summer schools

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

Academic services

Program Committee Member	DARS 2018-2019, HSCC 2019, RTSS 2021, HSCC 2022, CAV 2022
Reviewer	NFM 2016, CAV 2016, SCSC 2017, QEST 2017, FSTTCS 2017, FORMATS 2017, SEFM 2018, DSD 2018, CDC 2020-2018
Artifact Evaluation Committee Member	VMCAI 2021

Computer skills

Languages	PYTHON, FORTRAN, C++, MATLAB, Turbo Pascal, COBOL, shell script, HTML, L ^A T _E X, PL/SQL	Data Basis	DB2, Oracle
Software	VMD, GROMACS, Gnuplot	Operating Systems	Linux, Microsoft Windows, MVS

Languages

<i>Spanish</i>	Mother tongue
<i>English</i>	C1 level on reading and B2 on the rest
<i>Italian</i>	level A2 certified and good communication skills because I was living more than one year in Italy