

Personal Data

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Isabel García
Contreras

Work Experience

Nov 2021 - Present Postdoctoral Fellow at **University of Waterloo**, Waterloo, Canada
Sep 2016 - Aug 2021 Research Student at the **IMDEA Software Institute**, Madrid, Spain
Aug 2019 - Dec 2019 International Fellow at **SRI International**, Menlo Park, CA, USA
Feb 2014 - Jul 2015 Intern at **HPCN, Universidad Autónoma de Madrid**, Spain

Education

Jul 2021 PhD in Artificial Intelligence, **Universidad Politécnica de Madrid**.
Thesis: *A scalable static analysis framework for reliable program development exploiting incrementality and modularity*
Jul 2016 MSc in Artificial Intelligence, **Universidad Politécnica de Madrid**.
Master Thesis: *Code Search: A Semantic, Abstract Interpretation-based Approach*
Jul 2015 Degree in Computer Engineering, **Universidad Autónoma de Madrid**. Final Project: *Generación de Flujos en Redes Multigigabit Ethernet Acelerada Mediante Hardware Dedicado*
Top of class of 2015

Research Interests

My research interests include static analysis and verification of software, abstract interpretation, in particular, how to perform them in a scalable way, (constraint) logic programming, and semantic code search.

Selected Publications

- [1] M.A. Sanchez-Ordaz, I. Garcia-Contreras, V. Perez-Carrasco, J. F. Morales, P. Lopez-Garcia, and M. V. Hermenegildo. Verify: On-the-fly Assertion Checking via Incrementality. *Theory and Practice of Logic Programming*, September 2021. Special Issue on ICLP'21.
- [2] I. Garcia-Contreras, J. F. Morales, and M. V. Hermenegildo. Incremental and Modular Context-sensitive Analysis. *Theory and Practice of Logic Programming*, 21(2):196–243, January 2021.
- [3] R. Bruni, R. Giacobazzi, R. Gori, I. Garcia-Contreras, and D. Pavlovic. Abstract Extensionality – On the Properties of Incomplete Abstract Interpretations. In *Proc. ACM Symposium on Principles of Programming Languages 2020*, January 2020.
- [4] I. Garcia-Contreras, J.F. Morales, and M. V. Hermenegildo. Incremental Analysis of Logic Programs with Assertions and Open Predicates. In *Proceedings of the 29th International Symposium on Logic-based Program Synthesis and Transformation (LOPSTR'19)*, volume 12042 of LNCS, pages 36–56. Springer, 2020.
- [5] I. Garcia-Contreras, J.F. Morales, and M. V. Hermenegildo. Experiments in Context-Sensitive Incremental and Modular Static Analysis in CiaoPP. In *10th Workshop on Tools for Automatic Program Analysis (TAPAS'19)*, October 2019. (Extended Abstract).
- [6] I. Garcia-Contreras, J.F. Morales, and M. V. Hermenegildo. Multivariant Assertion-based Guidance in Abstract Interpretation. In *Post-Proceedings of the 28th International Symposium on Logic-based Program Synthesis and Transformation (LOPSTR'18)*, number 11408 in LNCS, pages 184–201. Springer-Verlag, January 2019.
- [7] I. Garcia-Contreras, J. F. Morales, and M. V. Hermenegildo. Semantic Code Browsing. *Theory and Practice of Logic Programming*, 32nd Int'l. Conference on Logic Programming (ICLP'16) Special Issue, 16(5-6):721–737, September 2016.

Teaching

Winter 2022 *Software Testing, Quality Assurance, and Maintenance (TA)*, University of Waterloo, Canada
Feb - July of 2021/2020/2019 *Declarative programming: Logic and constraints*, School of Computer Science, UPM, Spain

Projects

I have participated in the projects:

- 2020 - 2021 PROCODE: *Rigorous methods for the development of software systems with certified quality and reliability*. Code: PID2019-108528RB-C21. Spanish MICIIN.
- 2018 - 2020 TRACES: *Technologies and tools for Resource-Aware, Correct, Efficient Software*. Code: TIN2015-67522-C3-1-R. Spanish MINECO.

Talks

- Sep 2021 *VeriFly: On-the-fly Assertion Checking via Incrementality*, ICLP'21, Porto, Portugal (virtual).
- May 2021 *Verifly: On-the-fly assertion checking with CiaoPP*, F-IDE'21, Co-located with NASA Formal Methods (virtual).
- Mar 2021 *Incremental and Modular Context-sensitive Analysis*, HCVS'21, Luxembourg, Luxembourg (virtual).
- Mar 2020 *Modular Verification of C Programs*, IMDEA Software Institute, Madrid, Spain.
- Dec 2019 *Modular Verification of C Programs*, SRI International, Menlo Park, CA, USA.
- Oct 2019 *Experiments in Context-Sensitive Incremental and Modular Static Analysis in CiaoPP*, TAPAS'19, Porto, Portugal.
- Oct 2019 *Incremental Analysis of Logic Programs with Assertions and Open Predicates*, LOPSTR'19, Porto, Portugal.
- May 2019 Code. Analyze. Repeat. *Incremental and Modular Static Program Analysis*, Simposio 2019: My Thesis in a Nutshell, UPM, Madrid.
- Feb 2019 *Cocinando la informática*, Int'l Day of Women and Girls in Science, I.E.S. San Isidro, Madrid, Spain.
- Oct 2018 Code. Analyze. Repeat. *Incremental and Modular Static Program Analysis*, womENCourage'18, Belgrade, Serbia.
- Sep 2018 *Assertion-base Guidance in Abstract Interpretation*, LOPSTR'18, Frankfurt, Germany.
- Jul 2018 *Towards Incremental and Modular Context-sensitive Analysis*, ICLP'18 - FLoC'18, Oxford, UK.
- Jun 2018 *Towards Better User Guidance in Abstract Interpretation*, IMDEA Software Institute, Madrid, Spain.
- Jul 2017 *Code Search: A Semantic, Abstract Interpretation-based Approach*, Jornadas SISTEDES'17, La Laguna, Spain.
- Jun 2017 *Incremental and Modular Context-sensitive Analysis*, IMDEA Software Institute, Madrid, Spain.
- Oct 2016 *Semantic Code Browsing*, ICLP'16, New York, USA.
- Jun 2016 *Abstract Code Browsing*, IMDEA Software Institute, Madrid, Spain.

Scholarships and Prizes

- 2017 - 2021 FPU Grant 16/04811 by Spanish Ministerio de Educación y Ciencia
- Oct 2018 1st prize in womENCourage'18 Hackathon
- Jul 2017 Best Ms. Thesis SISTEDES-Accenture Technology prize
- 2016 José Cuenca Award from the Department of Artificial Intelligence, UPM
- 2013 - 2014 Excellence Scholarship (Comunidad de Madrid, Spain)
- 2012 - 2013 Excellence Scholarship (Comunidad de Madrid, Spain)
- Sep 2012 Premio esfuerzo EPS (Universidad Autónoma de Madrid, UAM)
- Summer 2010 Scholarship of the German Embassy in Spain "Alumnos premio"
- Jun 2010 2nd prize of "Descubriendo la ciencia" from Auxilab

Other Activities

- Nov 2020 Participated in the **Madrid Science Week** disseminating event.
- Feb 2020 Co-organized "**Rompiendo códigos: Mujeres y niñas en la ciencia**", celebrated in the framework of the International Day of Women and Girls in Science.
- Spring 2019 **Chair of the Software Seminar Series** (Spring season) at the IMDEA Software Institute.
- Mar 2019 Participated in the **Madrid Science Fair**, disseminating the research that takes place in the IMDEA Software Institute to students.
- Feb 2019 Co-organized "**I+D+M²: Mujeres en Montegancedo**", celebrated in the framework of the International Day of Women and Girls in Science, it is a local conference to disseminate the work of female scientists of the Technical University of Madrid.
- Feb 2018 Participated in a radio debate in the framework of the International Day of Women and Girls in Science.

Attended Courses

Summer 2019	Summer School Marktoberdorf 2019. Safety and Security of Software Systems: Logics, Proofs, Applications
Apr 2018	Foundations of Computability Theory (MUSS, UPM)
Apr 2017	Code Obfuscation: A Hacking view on program analysis and understanding (MUSS, UPM)
May 2015	PCB design with Altium Designer (Electra Training)

Computer Skills

Prolog, c, \LaTeX , git, gitlab, Docker, C++, vhdl, verilog, lisp, cuda, bash, c#, html, css, python, sql, Java

Languages

Spanish:	Native		English:	Fluent		German:	Basic
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