Antonio E. Flores Montoya

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Education

September 2012 - August 2017: PhD in Computer Science
Institution: Technical University of Darmstadt.
Topic: Cost Analysis of Programs Based on the Refinement of Cost Relations.
Advisor: Reiner Hähnle.
Grade: Summa cum laude (with distinction).

February - April 2016: DAAD Short scholarship for PhD students
Institution: Technical University of Vienna.
Mentor: Florian Zuleger.

October 2011 - June 2012: Master en Investigación en Informática (master in computer science research)
Institution: Complutense University of Madrid.
Master Thesis: Analysis of May-Happen-in-Parallel in Concurrent Objects.
Advisors: Elvira Albert and Samir Genaim.

2006 - 2011: Ingeniería en Informática (5 years degree in computer science)
Institution: Complutense University of Madrid.
Average Grade: 94.8% (Valedictorian).
I was awarded the "Premio Extraordinario de Licenciatura" (Extraordinary Degree award).

2009 - 2010: Trans-Atlantic Science Student Exchange Program (TASSEP)
Institution: North Carolina State University.
Reference: http://studyabroad.unc.edu/tassep/

Employment

September 2012 - August 2017 : PhD student
Institution: Technical University of Darmstadt.
Advisor: Reiner Hähnle.

October 2011 - August 2012: Research Assistant, PROMETIDOS-CM
Institution: Complutense University of Madrid.

June 2010 - Sept 2011: Research internship, Dept. of Computer Science
Institution: Complutense University of Madrid.

Teaching

October 2016-February 2017: Automated Theorem Proving (Exercises)
I was in charge of the problem sessions of the master course "Automated Theorem Proving" which focuses on the theoretical foundations of calculi for automated theorem proving in first-order logic. It includes topics such as resolution, tableaux and SAT solving.

April-July 2014: Automated Theorem Proving (Exercises)

April-July 2013: Automated Theorem Proving (Exercises)

Software

CoFloCo: A static analysis tool to infer automatically symbolic complexity bounds of imperative and recursive programs. CoFloCo is open source and available at https://github.com/aeflores/CoFloCo

In September 2016 CoFloCo participated in the termination competition: in two categories obtaining the second position in both:

- Complexity of Integer Transition Systems: (1) AProVE (2) CoFloCo (3) TcT (4) Loopus
- Complexity of Integer C programs: (1) Loopus (2) CoFloCo (3) AProVE (4) TcT

DeCo: A deadlock analyzer for concurrent objects.

MayPar: A may-happen-in-parallel (MHP) static analyzer for a distributed asynchronous language based on concurrent objects. It allows analyzing an application and finding out the pairs of statements that can execute in parallel.

COSTA: I also contributed to the COSTA system http://costa.ls.fi.upm.es/. A resource analysis tool for Java Bytecode. In particular, I implemented a class analysis and a liveness analysis in order to improve the system's precision.

Both DeCo and MayPar are integrated in the SACO system, a static analyzer for concurrent objects http://costa.ls.fi.upm.es/web/saco.php.

Publications in Conferences

- Antonio Flores-Montoya. Upper and lower amortized cost bounds of programs expressed as cost relations. In John S. Fitzgerald, Constance L. Heitmeyer, Stefania Gnesi, and Anna Philippou, editors, *Proceedings of Formal Methods - 21st International Symposium, FM 2016*, volume 9995 of *Lecture Notes in Computer Science*, pages 254–273. Springer, 2016. Pdf

- Elvira Albert, Antonio Flores-Montoya, and Samir Genaim. May-happen-in-parallel analysis with condition synchronization. In Marko C. J. D. van Eekelen and Ugo Dal Lago, editors, *Foundational and Practical Aspects of Resource Analysis - 4th International Workshop, FOPARA 2015, Revised Selected Papers*, volume 9964 of *Lecture Notes in Computer Science*, pages 1–19, 2015. Pdf

- Antonio Flores-Montoya and Reiner Hähnle. Resource analysis of complex programs with cost equations. In Jacques Garrigue, editor, *12th Asian Symposium on Programming Languages and Systems, APLAS 2014*, volume 8858 of *Lecture Notes in Computer Science*, pages 275–295. Springer, 2014. Pdf

- Elvira Albert, Antonio Flores-Montoya, Samir Genaim, and Enrique Martin-Martin. Termination and cost analysis of loops with concurrent interleavings. In Dang Van Hung and Mizuhito Ogawa, editors, *Proceedings of Automated Technology for Verification and Analysis - 11th International Symposium, ATVA 2013*, volume 8172 of *Lecture Notes in Computer Science*, pages 349–364. Springer, 2013. Pdf

- Antonio Flores-Montoya, Elvira Albert, and Samir Genaim. May-happen-in-parallel based deadlock analysis for concurrent objects. In Dirk Beyer and Michele Boreale, editors, *Proceedings of Formal Techniques for Distributed Systems - Joint IFIP WG 6.1 International Conference, FMOODS/FORTE 2013*, volume 7892 of *Lecture Notes in Computer Science*, pages 273–288. Springer, 2013. Link

- Elvira Albert, Antonio Flores-Montoya, and Samir Genaim. Analysis of may-happen-in-parallel in concurrent objects. In Holger Giese and Grigore Rosu, editors, *Proceedings of Formal Techniques for Distributed Systems - Joint 14th IFIP WG 6.1 International Conference, FMOODS 2012 and 32nd IFIP WG 6.1 International Conference, FORTE 2012*, volume 7273 of *Lecture Notes in Computer Science*, pages 35–51. Springer, 2012. Link

Publications in Journals

- Elvira Albert, Antonio Flores-Montoya, Samir Genaim, and Enrique Martin-Martin. Rely-guarantee termination and cost analyses of loops with concurrent interleavings. *Journal of Automated Reasoning*, 59(1):47–85, 2017. Pdf

- Elvira Albert, Antonio Flores-Montoya, Samir Genaim, and Enrique Martin-Martin. May-happen-in-parallel analysis for actor-based concurrency. *ACM Transactions on Computational Logic*, 17(2):11:1–11:39, 2016. Pdf

Tool papers in Conferences

- Elvira Albert, Puri Arenas, Antonio Flores-Montoya, Samir Genaim, Miguel Gómez-Zamalloa, Enrique Martin-Martin, Germán Puebla, and Guillermo Román-Díez. SACO: Static Analyzer for Concurrent Objects. In Erika Ábrahám and Klaus Havelund, editors, *Proceedings of Tools and Algorithms for the Construction and Analysis of Systems - 20th International Conference, TACAS 2014*, volume 8413 of *Lecture Notes in Computer Science*, pages 562–567. Springer, 2014. Pdf

- Elvira Albert, Antonio Flores-Montoya, and Samir Genaim. Maypar: a may-happen-in-parallel analyzer for concurrent objects. In Will Tracz, Martin P. Robillard, and Tevfik Bultan, editors, *20th ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE-20), SIGSOFT/FSE'12*, pages 1–4. ACM, 2012. Link

- Elvira Albert, Israel Cabañas, Antonio Flores-Montoya, Miguel Gómez-Zamalloa, and Sergio Gutiérrez. jPET: an Automatic Test-Case Generator for Java. In *18th Working Conference on Reverse Engineering, WCRE 2011*, pages 441–442. IEEE Computer Society, 2011. Pdf

Other Professional Activities

External Reviewer: FroCoS 17, iFM 17, CADE 17, TACAS 17, IJCAR 16, iFM 16, FMCAD 15, TACAS 2015, AISC 2014, and SAS 2013.

Research Projects Memberships

Envisage: Engineering Virtualized Services (European Project FP7 610582)
Period: September 2013 - September 2016
Head researcher: Prof. Einar Broch Johnsen
http://www.envisage-project.eu/

DOVES: Development Of Verifiable and Efficient Software
Period: February 2009 - December 2013
Head researcher: Manuel Hermenegildo Salinas

PROMETIDOS-CM: (Madrid Program in Rigorous Methods for the Development of Software)
Period: January 2010 - December 2013
Head researcher: Francisco Lopez Fraguas

Additional Education

- *NATO Advanced Study Institute- International Summer Shool MOD 2013: Software Systems Safety* held in Marktoberdorf (Germany) from July 30 to August 11, 2013 (63 hours).
- *HATS-FMCO international summer school on Formal Models for Components and Objects* held in Bertinoro (Italy) from September 24 to 28, 2012 (27 hours).
- *First Prometidos Summer School* held in Complutense University of Madrid in September 2011 (20 hours).
- *Software Verification with the KeY System.* held by professor Wolfgang Ahrendt at Polytechnic University of Madrid in June 2010 (20 hours).

Awards, Fellowships, and Grants

2010 - 2011	**Beca de Excelencia de la Comunidad de Madrid** (Excellence grant given by the Community of Madrid)
2008 - 2009	**Beca de Excelencia de la Comunidad de Madrid**
2007 - 2008	**Beca de Excelencia de la Comunidad de Madrid**

Languages

- Spanish: Native
- English: Expert
- German: Advanced