

Samir Genaim

Curriculum Vitae

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Education

- 1998–2002** • **Ph.D.** (summa cum laude) in Computer Science at [Ben-Gurion University of the Negev](#), Beer-Sheva, Israel.
Thesis : Semantic Based Workbench For Termination Analysis of Logic Programs
Advisor: [Prof. Michael Codish](#)
- 1996–1998** • **M.Sc.** (cum laude) in Mathematics and Computer Science at [Ben-Gurion University of the Negev](#), Beer-Sheva, Israel.
- 1993–1996** • **B.Sc.** (cum laude) in Mathematics and Computer Science at [Ben-Gurion University of the Negev](#), Beer-Sheva, Israel.

Employment History

- 2008–** • **Profesor Contratado Doctor**, [Facultad de Informática, Universidad Complutense de Madrid](#), Madrid, Spain. Since 03/12/2008.
- 2006–2008** • **Juan de la Cierva** researcher at the [CLIP Group, Departamento de Inteligencia Artificial, Facultad de Informática, Universidad Politécnica de Madrid](#), Madrid, Spain. From 01/02/2006 until 02/12/2008.
- 2005–2006** • Postdoctoral researcher at the [CLIP Group, Departamento de Inteligencia Artificial, Facultad de Informática, Universidad Politécnica de Madrid](#), Madrid, Spain. From 28/03/2005 until 31/01/2006.
- 2003–2005** • **Marie Curie** reserach fellow with [Prof. Roberto Giacobazzi](#) at the [Dipartimento di Informatica, Università degli Studi di Verona](#), Verona, Italy. From 28/03/2003 until 27/03/2005.
- 1996–2002** • Teaching assistant and lecturer at the [Department of Computer Science, Ben-Gurion University of the Negev](#), Beer-Sheva, Israel – during Ph.D. and M.Sc. studies. From 01/10/1996 until 31/09/2002.
- 1991–1993** • Software Developer at Eid Computers, Baqa El-Gharbia, Israel. Developing educational software in Arabic and Hebrew.

Fellowships, Awards, Prizes, etc.

Fellowships

- 2005 ❖ **Juan de la Cierva fellowship:** *Theory and Practice of Abstract Interpretation for Program Development*. Three years postdoctoral fellowship awarded by the *Spanish Ministry of Education and Science*. From 01/02/2006 until 03/12/2008.
- 2003 ❖ **Marie Curie fellowship:** *Property driven design of static program analyses* – Fellowship no. HPMF-CT-2002-01848. Two years postdoctoral fellowship, with *Prof. Roberto Giacobazzi* at the *Dipartimento di Informatica*, awarded by the *European Commission*. From 28/03/2003 until 27/03/2005.
- 1999 ❖ **Eshkol Grant:** *Semantic Based Programming Environments* – Grant no. 81807301. Three years grant for doctoral studies awarded by the *Israeli Ministry of Science*. From 01/11/1998 until 31/10/2001.
- 1998 ❖ **Kreitman Foundation fellowship:** Four years fellowship for doctoral studies awarded by the *Kreitman Foundation*. From 01/10/1998 until 30/09/2002.

Awards, Prizes, etc.

- 2003 ❖ **Ben-Gurion University of the Negev Rector's Prize** for excellence in Ph.D. studies. This prize is given to only one Ph.D. student each year.
- ❖ The **Knesset (Parliament of Israel) award** for excellence in Ph.D. studies.
- 1997 ❖ **Intel Prize** for excellence in M.Sc. studies.

Research Interests

Keywords: Semantic-based static program analysis, Abstract interpretation, Resource usage analysis, Termination analysis.

My research expertise is in the area of formal approaches to program analysis. This includes developing program analysis tools and their underlying theory in order to statically (i.e. without execution) infer run-time properties of a given program. These tools are used for certification, verification, debugging, optimization and program development. I am also interested in the algorithmic and complexity aspects of the underlying problems.

Publications

All publications are available on-line from <http://samir.loopkiller.com>

Journal Publications

- ❖ Elvira Albert, Samir Genaim, Raúl Gutiérrez, and Enrique Martin-Martin. A Transformational Approach to Resource Analysis with Typed-norms Inference. *Theory and Practice of Logic Programming*, 20(3):310–357, 2020.
DOI: [10.1017/S1471068419000401](https://doi.org/10.1017/S1471068419000401)
- ❖ Jesús J. Doménech, John P. Gallagher, and Samir Genaim. Control-Flow Refinement by Partial Evaluation, and its Application to Termination and Cost Analysis. *Theory and Practice of Logic Programming*, 19(5-6):990–1005, 2019.
DOI: [10.1017/S1471068419000310](https://doi.org/10.1017/S1471068419000310)

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DOI: [10.1007/s10817-016-9400-6](https://doi.org/10.1007/s10817-016-9400-6)
- Elvira Albert, Richard Bubel, Samir Genaim, Reiner Hähnle, Germán Puebla, and Guillermo Román-Díez. A Formal Verification Framework for Static Analysis - As well as its instantiation to the resource analyzer COSTA and formal verification tool KeY. *Software and Systems Modeling*, 15(4):987–1012, 2016.
DOI: [10.1007/s10270-015-0476-y](https://doi.org/10.1007/s10270-015-0476-y)
- 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.
DOI: [10.1145/2824255](https://doi.org/10.1145/2824255)
- Elvira Albert, Puri Arenas, Jesús Correas, Samir Genaim, Miguel Gómez-Zamalloa, Germán Puebla, and Guillermo Román-Díez. Object-Sensitive Cost Analysis for Concurrent Objects. *Software Testing, Verification and Reliability*, 25(3):218–271, 2015.
DOI: [10.1002/stvr.1569](https://doi.org/10.1002/stvr.1569)
- Elvira Albert, Puri Arenas, Samir Genaim, and Germán Puebla. A Practical Comparator of Cost Functions and Its Applications. *Science of Computer Programming*, 111(3):483–504, 2015.
DOI: [10.1016/j.scico.2014.12.001](https://doi.org/10.1016/j.scico.2014.12.001)
- Damiano Zanardini and Samir Genaim. Inference of Field-Sensitive Reachability and Cyclicity. *ACM Transactions on Computational Logic*, 15(4):33:1–33:41, September 2014.
DOI: [10.1145/2629478](https://doi.org/10.1145/2629478)
- Amir M. Ben-Amram and Samir Genaim. Ranking Functions for Linear-Constraint Loops. *Journal of the ACM*, 61(4):26:1–26:55, 2014.
DOI: [10.1145/2629488](https://doi.org/10.1145/2629488)
- Elvira Albert, Puri Arenas, Samir Genaim, Germán Puebla, and Guillermo Román-Díez. Conditional Termination of Loops over Heap-allocated Data. *Science of Computer Programming*, 92:2–24, 2014. Special issue on Bytecode 2012.
DOI: [10.1016/j.scico.2013.04.006](https://doi.org/10.1016/j.scico.2013.04.006)
- Samir Genaim and Damiano Zanardini. Reachability-based Acyclicity Analysis by Abstract Interpretation. *Theoretical Computer Science*, 474:60–79, 2013.
DOI: [10.1016/j.tcs.2012.12.018](https://doi.org/10.1016/j.tcs.2012.12.018)
- Elvira Albert, Samir Genaim, and Miguel Gómez-Zamalloa. Heap Space Analysis for Garbage Collected Languages. *Science of Computer Programming*, 78(9):1427–1448, 2013.
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- Amir M. Ben-Amram, Samir Genaim, and Abu Naser Masud. On the Termination of Integer Loops. *ACM Transactions on Programming Languages and Systems*, 34(4):16:1–16:24, 2012.
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- Elvira Albert, Puri Arenas, Samir Genaim, Germán Puebla, and Damiano Zanardini. Cost Analysis of Object-Oriented Bytecode Programs. *Theoretical Computer Science*, 413(1):142–159, 2012.
DOI: [10.1016/j.tcs.2011.07.009](https://doi.org/10.1016/j.tcs.2011.07.009)
- Elvira Albert, Puri Arenas, Samir Genaim, and Germán Puebla. Closed-Form Upper Bounds in Static Cost Analysis. *Journal of Automated Reasoning*, 46(2):161–203, 2011.
DOI: [10.1007/s10817-010-9174-1](https://doi.org/10.1007/s10817-010-9174-1)

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- Maurice Bruynooghe, Michael Codish, John P. Gallagher, Samir Genaim, and Wim Vanhoof. Termination Analysis of Logic Programs through Combination of Type-based Norms. *ACM Transactions on Programming Languages and Systems*, 29(2):10:1–10:44, 2007.
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- Samir Genaim and Michael Codish. Inferring Termination Conditions for Logic Programs using Backwards Analysis. *Theory and Practice of Logic Programming*, 5(1-2):75–91, 2005.
DOI: [10.1017/S1471068404002236](https://doi.org/10.1017/S1471068404002236)
- Samir Genaim, Jacob M. Howe, and Michael Codish. Worst-case Groundness Analysis using Definite Boolean Functions. *Theory and Practice of Logic Programming*, 1(5):611–615, 2001.
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- Elvira Albert, Samir Genaim, Enrique Martin-Martin, Alicia Merayo, and Albert Rubio. Lower-Bound Synthesis Using Loop Specialization and Max-SMT, In Alexandra Silva and K. Rustan M. Leino, editors, *Proceedings of the 33rd International Conference on Computer Aided Verification (CAV'21)*, volume 12760 of *Lecture Notes in Computer Science*, pages 863–886. Springer, 2021.
DOI: [10.1007/978-3-030-81688-9_40](https://doi.org/10.1007/978-3-030-81688-9_40)
- Amir M. Ben-Amram, Jesús J. Doménech, and Samir Genaim. Multiphase-Linear Ranking Functions and Their Relation to Recurrent Sets, In Bor-Yuh Evan Chang, editor, *Proceedings of the 26th International Symposium on Static Analysis (SAS'19)*, volume 11822 of *Lecture Notes in Computer Science*, pages 459–480. Springer, 2019.
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- Amir M. Ben-Amram and Samir Genaim. On Multiphase-Linear Ranking Functions, In Viktor Kuncak and Rupak Majumdar, editors, *Proceedings of the 29th International Conference on Computer Aided Verification (CAV'17)*, volume 10427 of *Lecture Notes in Computer Science*, pages 601–620. Springer, 2017.
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- Jesús Doménech, Samir Genaim, Einar Broch Johnsen, and Rudolf Schlatte. EasyInterface: A Toolkit for Rapid Development of GUIs for Research Prototype Tools, In Marieke Huisman and Julia Rubin, editors, *Proceedings of the 20th International Conference on Fundamental Approaches to Software Engineering (FASE'17)*, volume 10202 of *Lecture Notes in Computer Science*, pages 379–383. Springer, 2017.
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- Elvira Albert, Samir Genaim, and Pablo Gordillo. May-Happen-in-Parallel Analysis with Returned Futures, In Deepak D'Souza and K.Narayan Kumar, editors, *Proceedings of the 15th International Symposium on Automated Technology for Verification and Analysis (ATVA'17)*, volume 10482 of *Lecture Notes in Computer Science*, pages 42–58. Springer, 2017.
DOI: [10.1007/978-3-319-68167-2_3](https://doi.org/10.1007/978-3-319-68167-2_3)
- 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, *Proceedings of the 4th International Workshop on Foundational and Practical Aspects of Resource Analysis (FOPARA'15)*, *Revised Selected Papers*, volume 9964 of *Lecture Notes in Computer Science*, pages 1–19, 2016.
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- Pierre Ganty, Samir Genaim, Ratan Lal, and Pavithra Prabhakar. From Non-Zenoness Verification to Termination, In *Proceedings of the 13th ACM/IEEE International Conference on Formal Methods and Models for Codesign (MEMOCODE'2015)*, pages 228–237. IEEE, 2015.
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- Elvira Albert, Samir Genaim, and Pablo Gordillo. May-Happen-in-Parallel Analysis for Asynchronous Programs with Inter-Procedural Synchronization, In Sandrine Blazy and Thomas Jensen, editors, *Proceedings of the 22nd International Symposium on Static Analysis (SAS'15)*, volume 9291 of *Lecture Notes in Computer Science*, pages 72–89. Springer, 2015.
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- Elvira Albert, Puri Arenas, Jesús Correas, Samir Genaim, Miguel Gómez-Zamalloa, Enrique Martin-Martin, Germán Puebla, and Guillermo Román-Díez. Resource Analysis: From Sequential to Concurrent and Distributed Programs, In Nikolaj Bjørner and Frank D. de Boer, editors, *Proceedings of the 20th International Symposium on Formal Methods (FM'15)*, volume 9109 of *Lecture Notes in Computer Science*, pages 3–17. Springer, 2015.
DOI: [10.1007/978-3-319-19249-9_1](https://doi.org/10.1007/978-3-319-19249-9_1)
- Amir M. Ben-Amram and Samir Genaim. Complexity of Bradley-Manna-Sipma Lexicographic Ranking Functions, In Daniel Kroening and Corina Pasareanu, editors, *Proceedings of the 27th International Conference on Computer Aided Verification (CAV'15)*, volume 9207 of *Lecture Notes in Computer Science*, pages 304–321. Springer, July 2015.
DOI: [10.1007/978-3-319-21668-3_18](https://doi.org/10.1007/978-3-319-21668-3_18)
- Erika Abraham, Costas Bekas, Ivona Brandic, Samir Genaim, Einar Broch Johnsen, Ivan Kondov, Sabri Pllana, and Achim Streit. Preparing HPC Applications for Exascale: Challenges and Recommendations, In Leonard Barolli, Makoto Takizawa, Hui-Huang Hsu, Tomoya Enokido, and Fatos Xhafa, editors, *Proceedings of the 18th International Conference on Network-Based Information Systems (NBIS'15)*, pages 401–406. IEEE Computer Society, 2015.
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- 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 Abraham and Klaus Havelund, editors, *Proceedings of the 20th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS'14)*, volume 8413 of *Lecture Notes in Computer Science*, pages 562–567. Springer, 2014.
DOI: [10.1007/978-3-642-54862-8_46](https://doi.org/10.1007/978-3-642-54862-8_46)
- Elvira Albert, Samir Genaim, and Raúl Gutiérrez. A Transformational Approach to Resource Analysis with Typed-Norms, In Gopal Gupta and Ricardo Peña, editors, *Proceedings of the 23rd International Symposium on Logic-based Program Synthesis and Transformation (LOPSTR'13)*, volume 8901 of *Lecture Notes in Computer Science*, pages 38–53. Springer, 2014.
DOI: [10.1007/978-3-319-14125-1_3](https://doi.org/10.1007/978-3-319-14125-1_3)
- 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 the 11th International Symposium on Automated Technology for Verification and Analysis (ATVA'13)*, volume 8172 of *Lecture Notes in Computer Science*, pages 349–364. Springer, 2013.
DOI: [10.1007/978-3-319-02444-8_25](https://doi.org/10.1007/978-3-319-02444-8_25)
- Elvira Albert, Samir Genaim, and Enrique Martin-Martin. May-Happen-in-Parallel Analysis for Priority-based Scheduling, In Ken McMillan, Aart Middeldorp, and Andrei Voronkov, editors, *Proceedings of the 19th International Conference on Logic for Programming Artificial Intelligence and Reasoning (LPAR-19)*, volume 8312 of *Lecture Notes in Computer Science*, pages 18–34. Springer, December 2013.
DOI: [10.1007/978-3-642-45221-5_2](https://doi.org/10.1007/978-3-642-45221-5_2)

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- Diego Esteban Alonso-Blas, Puri Arenas, and Samir Genaim. Precise Cost Analysis via Local Reasoning, In Dang Van Hung and Mizuhito Ogawa, editors, *Proceedings of the 11th International Symposium on Automated Technology for Verification and Analysis (ATVA'13)*, volume 8172 of *Lecture Notes in Computer Science*, pages 319–333. Springer, 2013.
DOI: [10.1007/978-3-319-02444-8_23](https://doi.org/10.1007/978-3-319-02444-8_23)
- 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 the International Conference on Formal Techniques for Distributed Systems (FMOODS/FORTE'13)*, volume 7892 of *Lecture Notes in Computer Science*, pages 273–288. Springer, 2013.
DOI: [10.1007/978-3-642-38592-6_19](https://doi.org/10.1007/978-3-642-38592-6_19)
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- Amir M. Ben-Amram and Samir Genaim. On the Linear Ranking Problem for Integer Linear-Constraint Loops, In Roberto Giacobazzi and Radhia Cousot, editors, *Proceedings of the 40th Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL'13)*, volume 48(1) of *ACM SIGPLAN NOTICES*, pages 51–62. ACM, 2013. Nominated for CACM Research Highlights <http://www.sigplan.org/Highlights/Papers/>. Alternative DOI: <https://doi.org/10.1145/2429069.2429078>.
DOI: [10.1145/2480359.2429078](https://doi.org/10.1145/2480359.2429078)
- 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 Tefvik Sultan, editors, *Proceedings of the 20th ACM SIGSOFT Symposium on the Foundations of Software Engineering (FSE-20)*, pages 14:1–14:5. ACM, 2012.
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- Diego Esteban Alonso-Blas and Samir Genaim. On the Limits of the Classical Approach to Cost Analysis, In Antoine Miné and David Schmidt, editors, *Proceedings of the 19th International Symposium of Static Analysis (SAS'12)*, volume 7460 of *Lecture Notes in Computer Science*, pages 405–421. Springer, 2012.
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