## GERARDO SCHNEIDER'S LIST OF PUBLICATIONS

#### **Books**

1. M. Roggenbach, A. Cerone, B. Schlingloff, G. Schneider, and S. A. Shaikh. Formal Methods for Software Engineering - Languages, Methods, Application Domains. Texts in Theoretical Computer Science. An EATCS Series. Springer, 2022.

# Edited Books and Journals<sup>1,2</sup>

- 1. Gilles Barthe, Alberto Pardo, and Gerardo Schneider, editors. Software Engineering and Formal Methods, volume 14 of Journal of Software and System Modeling (SoSyM). Springer, February 2015.
- Gilles Barthe, Alberto Pardo, and Gerardo Schneider, editors. Software Engineering and Formal Methods, volume 7041 of Lecture Notes in Computer Science. Springer, November 2011.
- 3. Antonio Brogi and Gerardo Schneider, editors. Special Section: Formal Languages and Analysis of Contract-Oriented Software (FLACOS'10), volume 81(2) of Journal of Logic and Algebraic Programming. Elsevier, February 2012.
- Einar B. Johnsen, Olaf Owe, and Gerardo Schneider, editors. Special Issue: The 19th Nordic Workshop on Programming Theory (NWPT 2007), volume 78(7) of Journal of Logic and Algebraic Programming. Elsevier, August/September 2009.
- 5. Olaf Owe and Gerardo Schneider, editors. Special Issue: Formal Languages and Analysis of Contract-Oriented Software (FLACOS'07), volume 78(5) of Journal of Logic and Algebraic Programming. Elsevier, May/June 2009.
- Gordon Pace and Gerardo Schneider, editors. Special Issue: Formal Languages and Analysis of Contract-Oriented Software, volume 80(3-5) of Journal of Logic and Algebraic Programming. Elsevier, April-July 2011.
- 7. Gordon Pace and Gerardo Schneider, editors. Special Issue: Formal Languages and Analysis of Contract-Oriented Software (FLACOS'08), volume 80(1) of Journal of Logic and Algebraic Programming. Elsevier, January 2011.

### Journal Papers

- 1. Gerardo Schneider. Computing invariance kernels of polygonal hybrid systems. Nordic Journal of Computing, 11(2):194–210, 2004.
- Eugene Asarin, Gerardo Schneider, and Sergio Yovine. Algorithmic Analysis of Polygonal Hybrid Systems. Part I: Reachability. Theoretical Computer Science, 379(1-2):231–265, 2007.

<sup>&</sup>lt;sup>1</sup> All the publications can be downloaded from my homepage: http://www.cse.chalmers.se/~gersch/.

<sup>&</sup>lt;sup>2</sup> Till 2013 authors are listed alphabetically in almost all my publications, following the French tradition in formal methods, not reflecting the contribution of each author. Due to different publication policies by some of my co-authors the exception to the above are the following 3 papers: the 2013 IEEE TSE journal paper by G. Díaz et al., and the FLACOS'11 and IEEE SCC'10 papers by E. Martínez et al. From 2014, due to a change of publication policies, papers are not necessary in alphabetic order. A co-author contribution statement may be provided upon request.

- 3. Eugene Asarin, Gordon Pace, Gerardo Schneider, and Sergio Yovine. Algorithmic Analysis of Polygonal Hybrid Systems. Part II: Phase Portrait and Tools. *Theoretical Computer Science*, 390(1):1–26, January 2008.
- Eugene Asarin, Venkatesh Mysore, Amir Pnueli, and Gerardo Schneider. Low dimensional hybrid systems - decidable, undecidable, don't know. *Information* and Computation, 211:138–159, January 2012.
- 5. Cristian Prisacariu and Gerardo Schneider. A dynamic deontic logic for complex contracts. *Journal of Logic and Algebraic Programming*, 81(4):458–490, May 2012.
- Krasimir Angelov, John J. Camilleri, and Gerardo Schneider. A framework for conflict analysis of normative texts written in controlled natural language. *Journal* of Logic and Algebraic Programming, 82(5-7):216–240, July-October 2013.
- Hallstein Hansen, Gerardo Schneider, and Martin Steffen. Reachability analysis
  of complex planar hybrid systems. Science of Computer Programming (SCP),
  78(12):2511–2536, 2013.
- 8. Gregorio Díaz, M. Emilia Cambronero, Enrique Martínez, and Gerardo Schneider. Specification and Verification of Normative texts using C-O Diagrams. *IEEE Transactions on Software Engineering*, 40(8):795–817, 2014.
- Shaun Azzopardi, Gordon J. Pace, Fernando Schapachnik, and Gerardo Schneider. Contract Automata: An Operational View of Contracts Between Interactive Parties. Artificial Intelligence and Law, 24(3):203–243, September 2016.
- Wolfgang Ahrendt, Mauricio Chimento, Gordon Pace, and Gerardo Schneider. Verifying Data- and Control-Oriented Properties Combining Static and Runtime Verification: Theory and Tools. Formal Methods in System Design, 51(1):200–265, August 2017.
- John J. Camilleri and Gerardo Schneider. Modelling and analysis of normative documents. *Journal of Logical and Algebraic Methods in Programming*, 91:33–59, October 2017.
- 12. Raúl Pardo, Musard Balliu, and Gerardo Schneider. Formalising privacy policies in social networks. *Journal of Logical and Algebraic Methods in Programming*, 90:125–157, August 2017.
- Lara Ortiz-Martin, Pablo Picazo-Sanchez, Pedro Peris-Lopez, Juan Tapiador, and Gerardo Schneider. Feasibility analysis of inter-pulse intervals based solutions for cryptographic token generation by two electrocardiogram sensors. Future Generation Comp. Syst., 96:283–296, 2019.
- 14. César Sánchez, Gerardo Schneider, Wolfgang Ahrendt, Ezio Bartocci, Domenico Bianculli, Christian Colombo, Yliés Falcone, Adrian Francalanza, Srdan Krstić, Dejan Nickovic, Gordon J. Pace, Jose Rufino, Julien Signoles, Dmitriy Traytel, and Alexander Weiss. A Survey of Challenges for Runtime Verification from Advanced Application Domains (Beyond Software). Formal Methods in System Design, 54(3):279–335, August 2019. Open source, freely available at https://rdcu.be/b0hjI.
- Hanaa Alshareef, Raúl Pardo, Pablo Picazo-Sanchez, and Gerardo Schneider. A collaborative access control framework for online social networks. *Journal of Logical* and Algebraic Methods in Programming, 114, May 2020.
- 16. Pablo Picazo-Sanchez, Juan Tapiador, and Gerardo Schneider. After you, please: Browser extensions order attacks and countermeasures. *International Journal of Information Security*, 19(6):623–638, 2020.
- 17. Sandro Stucki, César Sánchez, Gerardo Schneider, and Borzoo Bonakdarpour. Gray-box monitoring of hyperproperties with an application to privacy. *Formal Methods in System Design*, 58(1-2):126–159, 2021.

- Hamed Arshad, Christian Johansen, Olaf Owe, Pablo Picazo-Sanchez, and Gerardo Schneider. Semantic attribute-based encryption: A framework for combining ABE schemes with semantic technologies. *Information Sciences*, 616:558–576, 2022.
- 19. William Hughes, Tobias Magnusson, Alejandro Russo, and Gerardo Schneider. Cheap and secure metatransactions on the blockchain using hash-based authorisation and preferred batchers. *Blockchain: Research and Applications*, December 2022. In Press, available online.
- Johanna Johansen, Tore Pedersen, Simone Fischer-Hübner, Christian Johansen, Gerardo Schneider, Arnold Roosendaal, Harald Zwingelberg, Anders Jakob Sivesind, and Josef Noll. A multidisciplinary definition of privacy labels. *Inf. Comput. Secur.*, 30(3):452–469, 2022.
- Pablo Picazo-Sanchez, Lara Ortiz-Martin, Gerardo Schneider, and Andrei Sabelfeld. Are chrome extensions compliant with the spirit of least privilege? International Journal of Information Security, 21(6):1283–1297, 2022.
- 22. Hamed Arshad, Christian Johansen, Pablo Picazo-Sanchez, and Gerardo Schneider. Attribute-based encryption with enforceable obligations. *Journal of Cryptographic Engineering*, 13(3):343–371, 2023.

# Refereed Contributions in Conference and Workshops Proceedings (peer-reviewed)

- 1. Gerardo Schneider and Xu Qiwen. Towards a formal semantics of verilog using duration calculus. In 5th International Symposium on Formal Techniques in Real-Time and Fault-Tolerant Systems (FTRTFT'98), number 1486 in LNCS, pages 282–293, Lyngby, Denmark, September 1998. Springer Verlag.
- Gerardo Lafferriere, George J. Pappas, Gerardo Schneider, and Sergio Yovine. Parameter synthesis in robot motion planning using symbolic reachability computation. In *Proceedings of 8th IEEE Mediterranean Conference on Control and Automation*, Rio, Greece, July 2000.
- 3. Eugene Asarin, Gerardo Schneider, and Sergio Yovine. On the decidability of the reachability problem for planar differential inclusions. In 4th International Workshop on Hybrid Systems: Computation and Control (HSCC'01), number 2034 in LNCS, pages 89–104, Rome, Italy, 2001. Springer-Verlag.
- Eugene Asarin, Gordon Pace, Gerardo Schneider, and Sergio Yovine. SPeeDI: a verification tool for polygonal hybrid systems. In *Computer Aided Verification* (CAV'02), volume 2404 of *LNCS*, pages 354–358, Copenhagen, Denmark, July 2002. Springer-Verlag.
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- 6. Eugene Asarin, Gerardo Schneider, and Sergio Yovine. Towards computing phase portraits of polygonal differential inclusions. In 5th International Workshop on Hybrid Systems: Computation and Control (HSCC'02), number 2289 in LNCS, pages 49–61, Stanford, USA, March 2002. Springer-Verlag.
- 7. Gordon Pace and Gerardo Schneider. Model checking polygonal differential inclusions using invariance kernels. In 5th International Conference on Verification, Model Checking and Abstract Interpretation (VMCAI'04), number 2937 in LNCS, pages 110–121, Venice, Italy, December 2003. Springer Verlag.

- 8. Pablo Giambiagi, Gerardo Schneider, and Frank D. Valencia. On the expressiveness of infinite behavior and name scoping in process calculi. In *Foundations of Software Science and Computation Structures (FOSSACS'04)*, volume 2987 of *LNCS*, pages 226–240, Barcelone, Spain, March 2004. Springer-Verlag.
- 9. Gilles Barthe, Mariela Pavlova, and Gerardo Schneider. Precise analysis of memory consumption using program logics. In 3rd IEEE International Conference on Software Engineering and Formal Methods (SEFM'05), pages 86–95, Koblenz, Germany, September 2005. IEEE Computer Society.
- David Cachera, Thomas Jensen, David Pichardie, and Gerardo Schneider. Certified memory usage analysis. In *Formal Methods (FM'05)*, volume 3582 of *LNCS*, pages 91–106, Newcastle Upon Tyne, UK, July 2005. Springer-Verlag.
- 11. Pablo Giambiagi and Gerardo Schneider. Memory consumption analysis of java smart cards. In *Proceedings of CLEI'05*, Cali, Colombia, October 2005.
- 12. Pablo Giambiagi, Olaf Owe, Anders P. Ravn, and Gerardo Schneider. Language-based support for service oriented architectures: Future directions. In *International Conference on Software and Data Technologies (ICSOFT'06)*, pages 339–344, Setúbal, Portugal, September 2006. INSTICC Press.
- 13. Einar B. Johnsen, Gerardo Schneider, and Øystein Torget. Runtime validation of communication histories. In *IEEE 2nd International Conference on Intelligent Computer Communication and Processing (ICCP'06)*, pages 161–168, Cluj-Napoca, Romania, September 2006. U.T.Press.
- 14. Gordon Pace and Gerardo Schneider. Static analysis for state-space reduction of polygonal hybrid systems. In 4th International Conference on Formal Modelling and Analysis of Timed Systems (FORMATS'06), volume 4202 of LNCS, pages 306–321, Paris, France, September 2006. Springer-Verlag.
- 15. Gordon J. Pace and Gerardo Schneider. A compositional algorithm for parallel model checking of polygonal hybrid systems. In 3rd International Colloquium on Theoretical Aspects of Computing (ICTAC'06), volume 4281 of LNCS, pages 168–182, Tunis, Tunisia, November 2006. Springer-Verlag.
- Johs H. Hammer and Gerardo Schneider. On the definition and policies of confidentiality. In 3rd International Symposium on Information Assurance and Security (IAS'07), pages 337–342, Manchester, UK, August 2007. IEEE Computer Society Press.
- 17. Olaf Owe, Gerardo Schneider, and Martin Steffen. Components, objects, and contracts. In 6th Workshop on Specification And Verification of Component-Based Systems (SAVCBS'07), ACM Digital Library, pages 95–98, Dubrovnik, Croatia, September 2007.
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- 19. Gordon Pace, Cristian Prisacariu, and Gerardo Schneider. Model checking contracts –a case study. In 5th International Symposium on Automated Technology for Verification and Analysis (ATVA'07), volume 4762 of LNCS, pages 82–97, Tokyo, Japan, October 2007. Springer-Verlag.
- 20. Cristian Prisacariu and Gerardo Schneider. A formal language for electronic contracts. In 9th IFIP International Conference on Formal Methods for Open Object-Based Distributed Systems (FMOODS'07), volume 4468 of LNCS, pages 174–189, Paphos, Cyprus, June 2007. Springer.
- 21. Marcel Kyas, Cristian Prisacariu, and Gerardo Schneider. Run-time monitoring of electronic contracts. In 6th International Symposium on Automated Technology

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- 25. Christian Colombo, Gordon J. Pace, and Gerardo Schneider. Dynamic event-based runtime monitoring of real-time and contextual properties. In 13th International Workshop on Formal Methods for Industrial Critical Systems (FMICS'08), volume 5596 of LNCS, pages 135–149, L'Aquila, Italy, September 2009. Springer-Verlag.
- 26. Christian Colombo, Gordon J. Pace, and Gerardo Schneider. LARVA Safer Monitoring of Real-Time Java Programs (Tool Paper). In 7th IEEE International Conference on Software Engineering and Formal Methods (SEFM'09), pages 33–37, Hanoi, Vietnam, 23–27 November 2009. IEEE Computer Society.
- 27. Christian Colombo, Gordon J. Pace, and Gerardo Schneider. Safe runtime verification of real-time properties. In *The 7th International Conference on Formal Modelling and Analysis of Timed Systems (FORMATS'09)*, volume 5813 of *LNCS*, pages 103–117, Budapest, Hungary, 2009. Springer. 13-16 September.
- 28. Stephen Fenech, Joseph Okika, Gordon J. Pace, Anders P. Ravn, and Gerardo Schneider. On the specification of full contracts. In 6th International Workshop on Formal Engineering approaches to Software Components and Architectures (FESCA'09), volume 253 of ENTCS, pages 39–55, York, UK, March 2009.
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- 30. Stephen Fenech, Gordon J. Pace, and Gerardo Schneider. Clan: A tool for contract analysis and conflict discovery. In 7th International Symposium on Automated Technology for Verification and Analysis (ATVA'09), volume 5799 of LNCS, pages 90–96, Macao, China, October 2009. Springer.
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- 33. Gordon J. Pace and Gerardo Schneider. Challenges in the specification of full contracts. In *Integrated Formal Methods (iFM'09)*, volume 5423 of *LNCS*, pages 292–306, Düseldorf, Germany, February 2009.
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- 35. Cristian Prisacariu and Gerardo Schneider. CL: An Action-based Logic for Reasoning about Contracts. In 16th Workshop on Logic, Language, Information and Computation (WOLLIC'09), volume 5514 of LNCS, pages 335–349, Tokyo, Japan, June 2009. Springer.
- 36. Hallstein A. Hansen and Gerardo Schneider. Reachability Analysis of GSPDIs: Theory, Optimization, and Implementation. In 25th Annual ACM Symposium on Applied Computing –Software Verification and Testing track (SAC-SVT'10), pages 2511–2516, Sierre, Switzerland, March 22-26 2010. ACM.
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- 38. Enrique Martinez and Gerardo Schneider. Automated Analysis of Conflicts in Software Product Lines. In SPLC Workshops 1st International Workshop on Formal Methods in Software Product Line Engineering (FMSPLE'10), volume 2, pages 75–82. Lancaster University, September 2010.
- 39. Enrique Martínez, María E. Cambronero, Gregorio Díaz, and Gerardo Schneider. Timed Automata Semantics for Visual e-Contracts. In 5th International Workshop on Formal Languages and Analysis of Contract-Oriented Software (FLACOS'11), volume 68 of EPTCS, pages 7–21, Málaga, Spain, 22-23 September 2011.
- Seyed M. Montazeri, Nivir Roy, and Gerardo Schneider. From Contracts in Structured English to CL Specifications. In 5th International Workshop on Formal Languages and Analysis of Contract-Oriented Software (FLACOS'11), volume 68 of EPTCS, pages 55–69, Málaga, Spain, 22-23 September 2011.
- 41. Wolfgang Ahrendt, Gordon J. Pace, and Gerardo Schneider. A Unified Approach for Static and Runtime Verification: Framework and Applications. In 5th International Symposium On Leveraging Applications of Formal Methods, Verification and Validation (ISoLA'12) Part I, volume 7609 of LNCS, pages 312–326, Heraclion, Crete, 15-18 October 2012. Springer.
- 42. Hallstein A. Hansen, Gerardo Schneider, and Martin Steffen. Reachability analysis of non-linear planar autonomous systems. In Fourth International Conference on Fundamentals of Software Engineering (FSEN'11), volume 7141 of LNCS, pages 206–220, Teheran, Iran, 20-22 April 2012. Springer.
- 43. Gerardo Schneider. Towards a framework for analyzing normative texts in controlled natural language. In 6th International Workshop on Formal Languages and Analysis of Contract-Oriented Software (FLACOS'12), EPTCS, Bertinoro, Italy, 19 September 2012.
- 44. Antonio Cerone, Markus Roggenbach, Holger Schlingloff, Gerardo Schneider, and Siraj Shaikh. Teaching formal methods for software engineering ten principles. In Fun with Formal Methods Workshop, July 2013.
- 45. Robert Nagy, Gerardo Schneider, and Aram Timofeitchik. Automatic testing of real-time graphics systems. In 19th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS'13), volume 7795 of LNCS, pages 465–479, Rome, Italy, 2013. Springer.
- 46. Pavel Rabetski and Gerardo Schneider. Migration of an on-premise application to the cloud: Experience report. In *European Conference on Service-Oriented and Cloud Computing (ESOCC'13)*, volume 8135 of *LNCS*, pages 227–241, Malaga, Spain, 2013. Springer.
- 47. John J. Camilleri, Gabrielle Paganelli, and Gerardo Schneider. A cnl for contractoriented diagrams. In *Fourth Workshop on Controlled Natural Language (CNL* 2014), volume 8625 of *LNCS*, pages 135–146. Springer, 2014.

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- 49. Wolfgang Ahrendt, Mauricio Chimento, Gordon Pace, and Gerardo Schneider. A specification language for static and runtime verification of data and control properties. In *Formal Methods (FM'15)*, volume 9109 of *LNCS*, pages 108–125, Oslo, Norway, June 24-26 2015. Springer.
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- 51. Hamid Ebadi, David Sands, and Gerardo Schneider. Differential Privacy: Now it's Getting Personal. In *Proceedings of the 42nd Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL'15)*, pages 69–81, Mumbai, India, 12-18 January 2015. ACM.
- 52. Gordon J. Pace, Fernando Schapachnik, and Gerardo Schneider. Conditional Permissions in Contracts. In The 28th International Conference on Legal Knowledge and Information Systems (JURIX'15), volume 279 of Frontiers in Artificial Intelligence and Applications, pages 61–70. IOS Press, 2015.
- 53. Wolfgang Ahrendt, Gordon Pace, and Gerardo Schneider. StaRVOOrS Episode II, Strengthen and Distribute the Force. In 7th International Symposium on Leveraging Applications of Formal Methods, Verification and Validation ISoLA'16 (1); Track: Static and Runtime Verification: Competitors or Friends?, volume 9952 of LNCS, pages 402–415. Springer, 10-14 October 2016.
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- 55. John J. Camilleri, Normunds Gruzitis, and Gerardo Schneider. Extracting Formal Models from Normative Texts. In 21st International Conference on Applications of Natural Language to Information Systems (NLDB'16), volume 9612 of LNCS, pages 403–408. Springer, 22-24 June 2016.
- 56. Gordon Pace, Raúl Pardo, and Gerardo Schneider. On the Runtime Enforcement of Evolving Privacy Policies in Online Social Networks. In 7th International Symposium on Leveraging Applications of Formal Methods, Verification and Validation – ISoLA'16 (2); Track: Runtime Verification and Enforcement, the (industrial) application perspective, volume 9953 of LNCS, pages 407–412. Springer, 10-14 October 2016.
- 57. Raúl Pardo, Christian Colombo, Gordon Pace, and Gerardo Schneider. An Automata-based Approach to Evolving Privacy Policies for Social Networks. In *The 16th International Conference on Runtime Verification (RV'16)*, volume 10012 of *LNCS*, pages 285–301. Springer, 2016.
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- 60. Thibaud Antignac, Mukelabai Mukelabai, and Gerardo Schneider. Specification, Design, and Verification of an Accountability-aware Surveillance Protocol. In The 32nd ACM/SIGAPP Symposium On Applied Computing –Software Verification and Testing track (SAC-SVT'17), pages 1372–1378. ACM, 2017.
- 61. Thibaud Antignac, David Sands, and Gerardo Schneider. Data Minimisation: A Language-Based Approach. In *IFIP Information Security & Privacy Conference (IFIP SEC'17)*, volume 502 of *IFIP Advances in Information and Communication Technology (AICT)*, pages 442–456, Rome, Italy, 2017. Springer Science and Business Media.
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#### Tools

I have participated in the implementation of the following tools:

- **SPeeDI:** Together with Gordon Pace, I have implemented a verification tool for Polygonal Differential Inclusions (SPDI).
- SPeeDI+: Together with Gordon Pace, I have extended the tool SPeeDI for computing phase portrait objects of SPDIs. http://www.cs.um.edu.mt/speedi/

Besides, I have contributed to the conceptual definition and underlying theoretical results for the following tools:

- AnaCon: A framework for analysis normative texts written in controlled natural language. http://www.cse.chalmers.se/~gersch/anacon/.
- CLAN: A tool for automatic detection of conflicts in deontic contracts. Main developer: Stephen Fenech. http://www.cs.um.edu.mt/svrg/Tools/CLTool
- GSPeeDI: A verification tool for Generalized Polygonal Hybrid Systems (GSPDI). Main developer: Hallstein A. Hansen.
- LARVA: A runtime verification platform for runtime verification of critical (real-time) systems. Main developer: Christian Colombo. http://www.cs.um.edu.mt/svrg/Tools/LARVA/