Compiler Verification : A Bibliography

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The area of software verification has grown its importance in software engineering. This is a bibliography of verification of a specialized class of softwares called compiler.

The citations are sorted year wise in chronological order with most recent years first. The format of each citation is authors; **Title**; *publisher*; year.

2003

0   Gerwin Klein, and Tobias Nipkow; **Verified Bytecode Verifiers**; *Theoretical Computer Science, 298:583-626*; 2003.

1   S. Berghofer, and M. Strecker; **Extracting a formally verified, fully executable compiler from a proof assistant**; *In Proceedings of Compiler Optimization meet Compiler Verification;* 2003.

2   Sabine Glesner, and Jan Olaf Blech; **Classifying and Formally Verifying Integer Constant Folding**; *In Proceedings of Compiler Optimization meet Compiler Verification;* 2003.

3   Thomas Genet, Thomas Jensen, Vikash Kodati, and David Pichardie; **A Java Card CAP Converter in PVS**; *In Proceedings of Compiler Optimization meet Compiler Verification;* 2003.

2002

4   Gerhard Goos; **Compiler Verification and Compiler Architecture**; *Electronic Notes in Theoretical Computer Science, Volume 65, Issue 2,* April 2002.

5   Lenore Zuck, Amir Pnueli, Yi Fang and Benjamin Goldberg; **VOC: A Translation Validator for Optimizing Compilers**; *Electronic Notes in Theoretical Computer Science, Volume 65, Issue 2,* April 2002.

6   Sabine Glesner, Rubino Geiß and Boris Boesler; **Verified Code Generation for Embedded Systems**; *Electronic Notes in Theoretical Computer Science, Volume 65, Issue 2,* April 2002.

7   Carl Christian Frederiksen; **Correctness of Classical Compiler Optimizations using CTL**; *Electronic Notes in Theoretical Computer Science, Volume 65, Issue 2,* April 2002.

8   Thi Viet Nga Nguyen and Francois Irigoin; **Alias verification for Fortran code optimization**; *Electronic Notes in Theoretical Computer Science, Volume 65, Issue 2,* April 2002.

9   K.C. Shashidhar, Maurice Bruynooghe, Francky Catthoor and Gerda Janssens; **Geometric Model Checking: An Automatic Verification Technique for Loop and Data Reuse Transformations**; *Electronic Notes in Theoretical Computer Science, Volume 65, Issue 2,* April 2002.

10   Clara Jaramillo, Rajiv Gupta and Mary Lou Soffa; **Debugging and Testing Optimizers through Comparison Checking**; *Electronic Notes in Theoretical Computer Science, Volume 65, Issue 2,* April 2002.

11   Wolfgang Goerigk; **Towards Acceptability of Optimizations: An Extended View of Compiler Correctness**; *Electronic Notes in Theoretical Computer Science, Volume 65, Issue 2,* April 2002.

12   Martin Strecker; **Formal Verification of a Java Compiler in Isabelle**; *Conference on Automated Deduction, Copenhagen, Denmark*, July 27-30, 2002.

13   A. Pnueli, Y. Rodeh, O. Strichman, and M. Siegel; **The small model property: How small can it be?** *Information and Computation, 178(1):279-293*, October 2002.

14   L. Zuck, A. Pnueli, Y. Fang, B. Goldberg, and Y. Hu; **Translation and run-time validation of optimized code**; In *2nd Workshop on Runtime Verification*, volume 70(4) of *Electronic Notes in Theoretical Computer Science, pages 180-201, Copenhagen, Denmark*, July 2002.

15   Raya Leviathan, and Amir Pnueli; **Validating software pipelining optimizations**; *Proceedings of the international conference on Compilers, architecture, and synthesis for embedded systems, Greenoble, France*; 2002.

2001

16   Axel Dold, and Vincent Vialard; **A Mechanically Verified Compiling Specification for a Lisp Compiler**; *Proc. of the 21st Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2001), Bangalore, India; Springer LNCS 2245*; December 13-15, 2001.

17   A. Dold, and V. Vialard; **A Mechanically Verified Bootstrap Compiler**; *Proceedings of Kolloquium Programmiersprachen und Grundlagen der Programmierung Technical report AIB-2001-11, RWTH Aachen, Department of Computer Science*, December 2001.

18   Wolfgang Goerigk, and Hans Langmaack; **Compiler Implementation Verification and Trojan Horses**; *Verifix technical report*, 2001.

19   L. Zuck, A. Pnueli, and R. Leviathan; **Validation of optimizing compilers**; *Technical Report MCS01-12, Weizmann Institute of Science*, August 2001.

2000

20   Wolfgang Goerigk; **Compiler verification revisited**; *In M;. Kaufmann, P. Manolios, J Moore (ed.): Computer Aided Reasoning: ACL2 Case Studies, Kluwer*, 2000.

21   George C. Necula; **Translation Validation for an Optimizing Compiler**; *In Proceedings of the 2000 ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI00), Vancouver, British Columbia, Canada*, June 18-21, 2000.

22   A. Pnueli, L. Zuck, and P. Pandya; **Translation validation of optimizing compilers by computational induction**; *Technical report, Weizmann Institute of Science*; 2000.

23   L. Zuck, A. Pnueli, and R. Leviathan; **Validations of optimizing compliers**; *Technical report, Weizmann Institute of Science*; 2000.

24   G.Goos, and W.Zimmermann; **Verifying Compilers and ASMs**; *Proceedings of ASM'2000 Workshop: Abstract State Machines, Theory and Applications, LNCS, Springer*, 2000.

25   W. Goerigk, and H. Langmaack; **Compiler Implementation Verification and Trojan Horses**; *In D. Bainov (ed.), Proceedings of the 9th International Colloquium on Numerical Analysis and Computer Sciences with Applications, Plovdiv, Bulgaria*, 2000.

26   W. Goerigk; **Proving Preservation of Partial Correctness with ACL2: A Mechanical Compiler Source Level Cor-**

rectness Proof.; *ACL2 Workshop 2000, Austin, Tx. U.S.A*, October 2000.

27 T. Gaul, W. Zimmermann, and W. Goerigk; **Practical Construction of Correct Compiler Implementations by Runtime Result Verification;** *In Proceedings of SCI'2000, International Conference on Information Systems Analysis and Synthesis, Orlando, Florida*, 2000

28 M. Müller-Olm, A. Wolf: **On Translation of Procedures to Finite Machines: Abstraction Allows a Clean Proof**; *In: G. Smolka (Eds): Programming Languages and Systems, Proceedings of the ESOP 2000, Lecture Notes in Computer Science 1782, Springer Verlag*, 2000.

29 R. van Engelen, D. Whalley, and Xin Yuan**, Automatic Validation of CodeImproving Transformations;** *Proceedings of the ACM SIGPLAN Workshop on Language, Compilers, and Tools for Embeded Systems*, June 2000.

1999

30 G. Goos and W. Zimmermann; **Verification of compilers**; *In Correct System Design, number 1710 in Lecture Notes in Computer Science, pages 201-230. SpringerVerlag*, 1999**.**

31 Wolfgang Naraschewski and Tobias Nipkow; **Type Inference Verified: Algorithm W in Isabelle/HOL**; *Journal of Automated Reasoning, Volume 23 , Issue 3*; November 1999.

32 A.Wolf; **An Exercise in Compiler Verification Revisited -- Preserving Partial Correctness**; *02/99 Verifix Report CAU 6.1*; 1999.

33 V.Vialard; **Local Verification of Parametrized Compilation Rules in a Limited Resource Environment**; *01/99 Verifix Report ULM 22.1*; 1999.

34 A.Dold , and V.Vialard; **Formal Verification of a Compiler Back-end Generic Checker Program**; *Proceedings of PSI'99: Andrei Ershov Third International Conference on Perspectives Of System Informatics*; 1999

35 Th. Gaul, W. Zimmermann, and W. Goerigk; **Construction of Verified Software Systems with Program-Checking: An Application To Compiler Back-Ends**; *In A. Pnueli und P. Traverso (eds.), Proc. FLoC'99 International Workshop on ``Runtime Result Verification'', Trento, Italy,* 1999.

36 A. Heberle, T. Gaul, W. Goerigk, G. Goos, and W. Zimmermann; **Construction of Verified Compiler Front-Ends with Program-Checking**; *In Proceedings of PSI '99: Andrei Ershov Third International Conference on Perspectives Of System Informatics, Nr. 1755, Lecture Notes in Computer Science, Novosibirsk, Russia*, 1999.

37 M. Müller-Olm, and A. Wolf; **On Excusable and Inexusable Failures: Looking for an Adequate Notion of Translation Correctness**; *In: J.M. Wing, J. Woodcock, J. Davies (Eds.): FM'99-Formal Methods, Proceedings (Vol. II), Lecture Notes in Computer Science 1709, Springer Verlag,* 1999.

38 A. Pnueli, M. Siegel, and O. Shtrichma*n*; **Translation Validation: From SIGNAL to C**; *In "Correct System Design", E.-R. Olderog and B. Steffen eds., LNCS State-of-the-Art Survey, volume 1710,Springer Verlag, 1999, pp. 231--255.;* 1999.

39 Wolf Zimmermann, Andreas Heberle, and Wolfgang Goerigk.; **The Verifix Approach Towards the Construction of Correct Compilers**; *Verifix Technical Report 1999.*

40 T.Gaul, M.Spott, M.Riedmiller, and R.Schohknecht; **Fuzzy-Neuro-Controlled Verified Instruction Scheduler**; *Conference Proceedings of NAFIPS'99, New York*; 1999.

1998

41 Tobias Nipkow. **Verified Lexical Analysis** (invited talk). *In Theorem Proving in Higher Order Logics (TPHOLs'98), LNCS 1479*, 1998.

42 U.Hoffmann; **Correct Implementation of Compiler Programs**; *In R. Berghammer and F. Simon (eds.) Workshop on Programming Languages and Fundamentals of Programming, Avendorf*, September 1998

43 U.Hoffmann; **Compiler Implementation Verification through Rigorous Syntactical Code Inspection**; *Ph.D. Thesis, Technical Faculty, CAU Kiel,* 1998.

44 A.Heberle, and W.Löwe; **On ASM-Based Specification of Programming Language Semantics and Reusable Correct Compilations**; *Proceedings of the 5th International Workshop on Abstract State Machines*; 1998

45 W. Goerigk, and U. Hoffmann ; **Rigorous Compiler Implementation Correctness: How to Prove the Real Thing Correct** ; *In D. Hutter, W. Stephan, P. Traverso, M. Ullmann (eds.), Applied Formal Methods - FM-Trends 98, Nr. 1641, Lecture Notes in Computer Science, S. 122 - 136*, 1998

46 W. Goerigk and F. Simon; **Towards Rigorous Compiler Implementation Verification**; *In: Julian Padget (ed.), Proceedings of the VIM Spring and Winter Workshops, Lecture Notes in Computer Science, Berlin, Heidelberg, New York, 1998. Springer Verlag. ;* 1998.

47 A.Dold; **Correct Compiler Construction in PVS**; *Verifix Report, ULM 20.1*; 1998.

48 David W.J. Stringer-Calvert; **Mechanical Verification of Compiler Correctness**; *Department of Computer Science, University of York;* March, 1998.

49 A. Pnueli, M. Siegel, and O. Shtrichman. **Translation Validation for Synchronous Languages**. *In K.G. Larsen, S. Skyum, and G. Winskel, editors, Proceedings of the 25th International Colloquium on Automata, Languages, and Programming (ICALP 1998), volume 1443 of Lecture Notes in Computer Science, pages 235-246. Springer-Verlag*, 1998.

50 A. Pnueli, M. Siegel, and E. Singerman. **Translation Validation**. *In B. Steffen, editor, Proceedings of the 4th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 1998), volume 1384 of Lecture Notes in Computer Science, pages 151-166. Springer-Verlag,* 1998.

51 Ofer Strichman, A. Pnueli and M. Siegel; **The Code Validation Tool (CVT) - Automatic Verification of a Compilation Process** ; *in the intl. Journal of Software Tools for Technology Transfer (STTT), Vol 2(2), pp 192-201,* 1998.

52 Ofer Strichman, A. Pnueli and M. Siegel; **The Code Validation Tool (CVT) - Automatic verification of code generated from synchronous languages**; *Proceedings of the international. workshop of Software Tools for Technology Transfer (STTT'98),* 1998.

53 Ofer Strichman, A. Pnueli and M. Siegel; **Translation validation for Synchronous Languages**; *Proceedings of the 25th International Colloquium on Automata, Languages, and Programming (ICALP'98)*; 1998.

54 A.Dold , T.Gaul, W.Zimmermann; **Mechanized Verification of Compiler Back-Ends**; *Proceedings of the International Workshop on Software Tools for Technology Transfer STTT '98*; 1998.

1997

55 Markus Müller-Olm**; Modular Compiler Verification: A Refinement-Algebraic Approach Advocating Stepwise Abstraction**.; *Lecture Notes in Computer Science (LNCS), Vol. 1283. Springer-Verlag, Heidelberg, Germany.*; 1997.

56 Th. Gaul, G. Goos, A. Heberle, W. Zimmermann, and W. Goerigk; **An Architecture for Verified Compiler Construction.** ; *In: Joint Modular Languages Conference JMLC'97, Linz, Austria,* March 1997.

57 W. Goerigk; **Towards Rigorous Compiler Implementation Verification**; *In: R. Berghammer und F. Simon (eds.), Proc. of the 1997 Workshop on Programming Languages and Fundamentals of Programming, S.\ 118 - 126, Avendorf, Germany,* November 1997.

58 Wolfgang Goerigk, Ulrich Hoffmann, und Hans Langmaack; **Rigorous Compiler Implementation Correctness: How to Prove the Real Thing Correct.** *Verifix-Arbeitsbericht Verifix/CAU-Ulm/2.6, CAU Kiel,* January 1997.

59 T.Gaul , and W.Zimmermann; **On the Construction of Correct Compiler Back-Ends: An ASM Approach**; *Journal of Universal Computer Science*, 1997.

60 A.Dold, F.v.Henke, H.Pfeifer, and H.Ruess; **Formal Verification of Transformations for Peephole Optimizations**; *(FME97) Formal Methods: Their Industrial Application and Strengthened Foundations*, 1997.

61 H.Langmaack; **Contribution to Goodenough's and Gerhart's Theory of Software Testing and Verification: Relation between Strong Compiler Test and Compiler Implementation Verification.**; *Foundations of Computer Science: Potential-Theory-Cognition, Springer LNCS 1337,* 1997.

62 Augusto Sampaio; **An Algebraic Approach to Compiler Design**; *World Scientific;* 1997.

1996

63 W. M. Farmer and J. D. Ramsdell; **A verified compiler for Multithreaded PreScheme** *Technical Report, 180 pp., The MITRE Corporation,* 1996.

64 E. Boerger, and I. Durdanovic; **Correctness of compiling Occam to Transputer Code**; *Computer Journal, vol 39, no 1, pages 52-92,* 1996.

65 M. Marcus, and A. Pnueli. **Using Ghost Variables to Prove Refinement**. In *Proceedings of the Fifth International Conference on Algebraic Methodology and Software Technology (AMAST'96),* volume 1101 of *Lecture Notes in Computer Science*, pages 226-240. Springer-Verlag, 1996.

66 A.Heberle, W.Zimmermann , and G.Goos **Specification and Verification of Compiler Front end Tasks: Semantic Analysis**; *04/96 Verifix Report UKA 7;* 1996.

67 W. Goerigk, A. Dold, Th. Gaul, G. Goos, A. Heberle, F. W. von Henke, U. Hoffmann, H. Langmaack, H. Pfeifer, H. Ruess, and W. Zimmermann; **Compiler Correctness and Implementation Verification: The Verifix Approach**; *In P. Fritzson (ed.), Proceedings of the Poster Session of CC '96 - International Conference on Compiler Construction, S. 65 -* *73, IDA Technical Report LiTH-IDA-R-96-12, Linkøping, Sweden,* 1996.

68 A.Dold; **Formalization and Verification of Code Generation Rules**; *09/96 Verifix Report ULM 16.1;* 1996.

1995

69 Guttman, J. D., V. Swarup, and J. Ramsdell; **The VLISP verified scheme system;** *Lisp and Symbolic Computation 8 (1/2), 33--110.*; 1995.

70 E. Boerger, and I. Durdanovic; **Correctness of compiling Occam to Transputer Code**, *in Evolving Algebra Mini Course, BRICS, Basic Research in Computer Science, Notes Series NS-95-4, ISSN 0909-3206, pages 153-194, University of Aarhus,* 1995.

71 Markus Müller-Olm; **An Exercise in Compiler Verification**.; *Proceedings of the 8th Workshop of the RWTH Aachen, CAU Kiel, and TU München on "Programming Languages and Foundations of Programming", Adalbert-Stifter-Haus, Altreichenau (Germany). MIP-Bericht (9519), pp. 48--54. Fakultät für Mathematik und Informatik, Universität Passau,* 1995.

72 W. Goerigk; **On the Correctness of Compilers and Compiler Implementations.** ; *In Workshop ``Alternative Konzepte für Sprachen und Rechner'', Bad Honnef,* 1995.

73 Markus Müller-Olm; **Modular Compiler Verification**. *Christian-Albrechts-Universität, Kiel, Kiel MMO 15/1, Germany. ProCoS Technical Report.* August 1995,

1994

74 Manfred Broy, Ursula Hinkel, Tobias Nipkow, Christian Prehofer, and Birgit Schieder; **Interpreter verification for a functional language.** *In Foundations of Software Technology and Theoretical Computer Science, volume 880 of LNCS, pages 77--88. Springer-Verlag,* 1994**.**

75 M. Fränzle, and M. Müller-Olm; **Towards Provably Correct Code Generation for a Hard Real-Time Programming Language**.; *5th International Conference on Compiler Construction (CC'94), Edinburgh (UK). (eds.: P.A. Fritzson), Lecture Notes in Computer Science (LNCS), Vol. 786, pp. 294--308. Springer-Verlag, Heidelberg, Germany*, April 1994.

76 Theodore S. Norvell, **Machine Code Programs are Predicates Too**; *Proceeding of the 6th Refinement Workshop, January 1994, David Till (Ed.), Workshops in Computing, Springer-Verlag,* 1994.

77 Theodore S. Norvell; **A Predicative Theory of Machine Language and its Application to Compiler Correctness**; *University of Toronto PhD Thesis*; 1994.

78 E. Borger, I. D - urd - anovi'c, and D. Rosenzweig. **Occam: Specification and compiler correctness**. **Part I: The primary model**. *In E.-R. Olderog, editor, Proc. of PROCOMET '94 (IFIP Working Conference on Programming Concepts, Methods and Calculi), pages 489--508. North-Holland,* 1994.

79 R. W. S. Hale; **Program compilation**; *In J. Bowen, editor, Towards Verified Systems, volume 2 of Real-Time Safety Critical Systems, chapter 7, pages 131--146. Elsevier,* 1994**.**

80 David S. Gladstein; **COMPILER CORRECTNESS FOR CONCURRENT LANGUAGES;** *PhD Thesis at the College of Computer Science of Northeastern University* ; December 1994.

1993

81 John Hannan; **Searching for semantics**; *Proceedings of the ACM SIGPLAN symposium on Partial evaluation and semantics-based program manipulation, Copenhagen, Denmark,* 1993.

82 A. sampaio, C.A.R Hoare and He Jifeng; **Normal Form Approach to Compiler Design**; *Acta Informatica, 30, 701-739,* 1993.

1992

83 John Hannan, and Frank Pfenning; **Compiler Verification in LF**; *Proceedings of the Seventh Annual IEEE Symposium on Logic in Computer Science, edited by Andre Scedrov, IEEE Computer Society Press,* 407-418, 1992.

84 H. Langmaack; **On Programming Languages Interpreters - Total Correctness**; *in: H. Langmaack, E. Neuhold, M. Paul (Hrsg.) "Software Construction - Foundation and Application", Seminar-Report, Int. Begegn.- u. Forschzentr. f. Informatik, Schloß Dagstuhl, Deutschland,* 1992.

85 H. Langmaack, B. Buth, K.-H. Buth, M. Fränzle, B. von Karger, Y. Lakhnech, M. Müller-Olm; **Provably correct compiler development and implementation**; *U. Kastens, P. Pfahler (eds.) "Compiler Construction", Proceed. 4th Int. Conf., CC'92, Paderborn, Germany, Oct. 1992, 141-155, LNCS 641, Springer* ,1992.

86 Markus Müller-Olm; **Total Correctness of an Interpreter**.; *Proceedings of the 6th Workshop of the RWTH Aachen, CAU Kiel, and TU München on "Programmiersprachen - Methoden, Semantik, Implementierungen", Landhaus Rothenberge (Germany). (eds.: W.-M. Lippe, G. Stroth), Technischer Bericht (7/92-I), pp. 141--155. Institut für Angewandte Mathematik und Informatik, Universität Münster,* 1992.

87 Markus Müller-Olm; **Total Correctness of an Interpreter**. *Christian-Albrechts-Universität, Kiel, Kiel MMO 4/1, Germany.*
ProCoS Technical Report. March 1992,

88 Fabio Q B da Silva; **Observational Equivalence and Compiler Correctness**; *LFCS report ECS-LFCS-92-240,* September 1992.

89 Fabio Q B da Silva; **Correctness Proofs of Compilers and Debuggers: an Approach Based on Structural Operational Semantics**; *LFCS report ECS-LFCS-92-241 (also published as CST-95-92);* 1992.

1990

90 Hans Langmaack, M. Fränzle, and M. Müller-Olm; **Development of Proven Correct Compilers in ProCoS**; *ProCoS Project Doc., Kiel MF7;* 1990.

91 A. Sampaio; **A Comparative Study of Theorm Provers: Proving Correctness of Compiling Specifications**; *Technical Report PRG-20-90, Oxford University, Computing Laboratory, 1990. Also as ProCoS Document [OU AS 90/1],* 1990.

1989

92 William D. Young. **Verified compilation in micro-Gypsy**; *In Proceedings of the ACM SIGSOFT '89 Third Symposium on Software Testing, Analysis, and Verification (TAV3), pages 20--26, Key West, Florida,* December 1989.

93 H. Langmaack, and M. Müller-Olm**; First Steps in Proven Correct Compiler Development in ProCoS**.; *Christian-Albrechts-Universität zu Kiel, [Kiel HL 1/2], Germany. ProCoS Technical Report;* October 1989.

94 J Strother Moore; **Mechanically Verified Language Implementation**; *Journal of Automated Reasoning;* 1989.

1986

95 Joëlle Despeyroux, **Proof of translation in Natural Semantics**, *first Symp. on Logic In Computer Science, LICS,* Cambridge, Ma, USA, June 1986. *Also appears as INRIA research report RR 514,* April 1986

1981

96 James W. Thatcher, Eric G. Wagner and Jesse B. Wright; **More on advice on structuring compilers and proving them correct**; *Theoretical Computer Science, Volume 15, Issue 3 , 1981, Pages 223-249;* 1981.

97 Wolfgang Polak; **Compiler Specification and Verification**; *Lecture Notes in Computer Science No. 124, Springer-Verlag;* 1981.

1973

98 F. Lockwood Morris; **Advice on structuring compilers and proving them correct**; *Proceedings of the 1st annual ACM SIGACT-SIGPLAN symposium on Principles of programming languages, Boston, Massachusetts,* 1973.

1967

99 John McCarthy, and James Painter; **Correctness Of A Compiler For Arithmetic Expression**; *Proceedings Symposium in Applied Mathematics, Vol 19, Mathematical Aspects of Computer Science,* 1967.

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