Curriculum Vitae

Teodor Rus
Department of Computer Science
The University of Iowa
Iowa City, IA 52242

February 20, 2018

Note: this version of my vitae does not contain updates that pertain to my retiring date of August 2012.

Contents

1 Personal data

Name: Teodor Rus, **Citizenship:** USA

Work address:	**Home address:**
Department of Computer Science	26 Dover Rd
The University of Iowa	Dover
Iowa City, Iowa 52242	Massachusetts 02030, USA
Phone number: (319)-335-0742	Phone number: 508-785-0462
Fax number: (319)-335-3624	
Email: rus@uiowa.edu	

1.1 Spoken languages

English, French, German, Romanian, Russian.

1.2 Education

- Doctor of Mathematics (PhD), Computer Science, Computing Institute of the Romanian Academy, Cluj-Napoca, Romania, 1965.

- Diplomat (MS), Mathematics, Babeş-Bolyai University Cluj-Napoca, Romania, 1960.

- Forester, College of Sylviculture, Forest Protection, Năsăud, Romania, 1955.

- Baccalaureate (BS), Mathematics emphasis, High School G. Coşbuc, Năsăud, Romania, 1955.

2 Employment history

1. Emeritus Professor, University of Iowa, Department of Computer Science, 2012.

2. Professor, Department of Computer Science, August 1993-2012

3. Associate Professor, tenured, Department of Computer Science, The University of Iowa, Iowa City, Iowa 52242, 1988 - August 1993.

4. Associate Professor, tenure track, Department of Computer Science, The University of Iowa, Iowa City, Iowa, August 1983 - 1988.

5. Visiting Associate Professor, Department of Computer Science, The University of Iowa, Iowa City, Iowa, 1982 - 1983.

6. Director of the Software Laboratory, Institute for Computing Technique, Cluj-Napoca, Romania, 1974 - 1982.

7. Visiting Professor, Department of Computer Science, Stirling University, Stirling, Scotland, U.K., Fall 1980.

8. Visiting Scientist, Chinese Academy of Science, Beijing, 1979.

9. Visiting Professor, Department of Computer Science, Université Laval, Department de Mathematiques, Quebec, Spring 1975.

10. Visiting Professor, Institute of Applied Mathematics, University of Saarlandes, Saarbrücken, 1972.

11. System Software Programmer, Compagnie Internationnel pour l'Informatique (CII), Paris, 1969-1970.

12. Senior Research Computer Scientist, Institute for Computing Technique, Cluj-Napoca, Romania, 1968-1977.

13. Research Computer Scientist, Computing Institute of the Romanian Academy, 1960 - 1968.

3 Research activity

3.1 Grants and awards

1. Grant #01-162, $29,948 awarded by Roy J. Carver Charitable Trust supporting the proposal "A unified language processing technology", January 2001.

2. NSF Grant CCR 99–87466, $10,000 to support the organization of the AMAST 2000, The Eighth AMAST International Conference, Iowa City, 24-26 May 2000.

3. ONR Grant Nr N00014–00–1–0588, $10,000 to support the organization of the AMAST 2000, The Eighth AMAST International Conference, Iowa City, 24-26 May 2000.

4. University Iowa Grant of $7,500 (Liberal Arts $2,500, Provost Office $2,500, VP Research $2,500) to support the organization of the AMAST 2000, The Eighth AMAST International Conference, Iowa City, 24-26 May 2000.

5. Organized the 8-th AMAST International Conference, held on 23–27 May 2000, in Iowa City.

6. International Travel Grant of $500 from Graduate College, MUCIA, and the Office of Vice President for Research, to travel to Oxford, UK, to present an invited talk, and to travel to Bamberg, German, to attend ARTS'99, during May 1999.

7. Awarded the honorary degree "Doctor Honoris Causa" by the Lucian–Blaga University, Sibiu, Romania, June 1997.

8. International Travel Grant of $500 from Graduate College, MUCIA, and the Office of Vice President for Research, to travel in Europe in summer 1996, PI.

9. ONR grant Nr N00014–96–1–0554, $5,000, to support the organization of the Third International Workshop on Real-Time Programming, 6–8 March 1996, Salt Lake City, Utah.

10. NSF Grant DUE–9551183, $215,369.60, Parallel Programming Consortium Enabling Education in Parallel Computing at the Undergraduate Level, PI, F. Potra and J. Brown, Co–PI.

11. ONR Grant Number N00014–95–1–0619, $10,000 Proposal for AMAST international cooperative research activity, 1995, PI.

12. NASA GSPR Program, 1 42496 97, $66,000, 1994-1997, covering one graduate student, (Eric Van Wyk) to do research on parallel program development tools, PI.

13. NSF Grant Number CCR-93-13858, $10,000 supporting the First AMAST Workshop on Real-Time System Development held on 1-3 November 1993, Iowa City, Iowa, PI.

14. International Travel Grant of $500 from Graduate College, MUCIA, and the Office of Vice President for Research, to travel in Europe in summer 1993, PI.

15. ONR Grant, N00014-93-1-0424, $16,000, supporting the Third International Conference on Algebraic Methodology and Software Technology, AMAST, June 21-25, 1993, Enschede, The Netherlands, PI.

16. IBM Graduate Fellowship Award covering one graduate student (Richard V. Marciano) for 1990-1991 and 1991-1992, PI.

17. NSF Grant Number CCR-90 14162, $20,000, offered to support "Second International Conference on Algebraic Methodology and Software Technology, AMAST, May 22-25, 1991, Iowa City, Iowa, PI.

18. Grant 233 MA 1802, two month salary support, offered by the Department of National Education of France, for one month joint research program, University of Paris 7, May 20 - June 20, 1990.

19. ONR Grant No. N00014-90-J-1836, $10,000, supporting the Second International Conference on Algebraic Methodology and Software Technology, AMAST, May 22-25, 1991, Iowa City, Iowa, PI.

20. ONR Grant, $10,000, supporting the First International Conference on Algebraic Methodology and Software Technology, PI.

21. Reviewer Excellence 1986 Award, from the Association for Computing Machinery, Computing Reviews Journal, 1987.

22. European Economic Community, Grant to attend the Advanced Course on Operating Systems, Munich, Fall 1977.

23. European Economic Community, Grant to attend the Advanced Course on Compiler Construction, Munich, Spring 1974.

24. European Economic Community, Grant to attend the Advanced Course on Software Engineering, Munich, Spring 1973.

25. Italian Mathematical Society (CIME), Grant to attend the summer school on logic, Varenna, Italy, Fall 1968.

3.2 Monographs and editorial publications

1. Computer-Based Problem Solving Process, monograph, 344 pages, 2015 World Scientific, ISBN 978-9814663731.

2. *Theoretical Computer Science*, Volume 291, Number 3, issue dedicated to AMAST'2000, T. Rus and C. Tinelli, Guest Editors.

3. *Algebraic Methodology and Software Technology*, T. Rus Editor, 8th International Conference, AMAST 2000, Iowa City, 24-26 May 2000, Lecture Notes in Computer Science 1816

4. *ARTS'97: Toward a mathematical transformation-based development*, Fourth AMAST Workshop on Real-Time Systems, Concurrent and Distributed Software, Palma, Mallorca, Spain, May 1997, Proceedings, T. Rus and M. Bertran, Editors, Springer-Verlag 1997, Lecture Notes in Computer Science 1231.

5. *Theoretical Computer Science*, Volume 140, Number 1, issue dedicated to AMAST'95, G. Scollo and T. Rus, Guest Editors.

6. *System Software and Software Systems: Concepts and Methodology*, Volume 1: *Systems Methodology for Software*, T. Rus and D. Rus, World Scientific 1995, Second printing.

7. *System Software and Software Systems: Concepts and Methodology*, Volume 2: *Execution Support Environment*, T. Rus and D. Rus, World Scientific 1995.

8. *Theories and Experiences for Real-Time System Development*, T. Rus and C. Rattray, Editors, AMAST Series in Computing Volume 2, World Scientific, 1995.

9. *Construction and Analysis of Transition Systems with MEC*, by A. Arnold, D. Bégay, P. Curbillé, AMAST Series in Computing, Vol. 3, Series Editor T. Rus, World Scientific 1994.

10. *Algebraic Methodology and Software Technology*, M. Nivat, C. Rattray, T. Rus, G. Scollo, Editors, Workshop in Computing, Springer-Verlag, London 1994.

11. *Algebraic Specification Techniques and Tools for Software Development*, by I. Classen, H. Ehrig, D. Woltz, AMAST Series in Computing, Vol. 1, Series Editor T. Rus, World Scientific, 1993.

12. *System Software and Software Systems: Concepts and Methodology*, Volume 1: *Systems Methodology for Software*, T. Rus and D. Rus, World Scientific 1993.

13. *System Software and Software Systems: Concepts and Methodology*, Vol 1: Systems Methodology for Software, Vol 2: Execution Support Environment, Vol 3: Programming Support Environment, World Scientific Publishing Co., Inc., 1992-1995.

14. *Theoretical Computer Science*, **112**, May 1993, issue dedicated to AMAST'91, Guest Editor.

15. *Proceedings of AMAST'91*, International Series "Workshop in Computing", Editor, Springer-Verlag, London 1992.

16. *Theoretical Computer Science* **77**, 1990, issue dedicated to AMAST'89, Guest Editor.

17. *System Software and Software Systems: Concepts and Methodology*, advanced undergraduate textbook on operating system topics. Available for student instruction at Iowa Memorial Union Book Store, Iowa City, August 1991, 535 pages.

18. *Algorithms and their Description using Flow-Diagrams* (in Romanian), undergraduate textbook published by the National Council for Science and Technology, Bucharest, 1973, 275 pages.

19. *Formal Tools for Language Specification*, Monograph, (in Romanian), Academy Press, Bucharest, 1983, 475 pages. **Zbl: 572 #68060**.[1]

20. *Data Structures and Operating Systems*, Monograph, John Wiley & Sons, Bucharest - Chichester - New York, A Wiley Interscience Publication, 1979, 364 pages. **Zbl: 503 #68002**, **MR: 80f #68001**, **C&IS 23, 4#221358**, **C&IS: 24, 5/6#236310**.

21. *Data Structures and Operating Systems*, Monograph, (in Romanian), Academy Press, Bucharest, 1974, 367 pages. **Zbl: 319 #68003**, **57 #18170 6802**.

3.3   Refereed journal papers

1. Milestones for Computing Future, JSEA 2017, 9, 52-56.

2. A unified language processing methodology, Theoretical Computer Science, Volume 281, (2002) 499–536.

3. Generating model checkers from algebraic specifications, by Teodor Rus, Eric Van Wyk, and Thomas Halverson, Formal Methods in System Design, Volume 20, No. 3, 249-284, 2002.

4. Using model checking in a parallelizing compilers, by Teodor Rus and Eric Van Wyk, Parallel Processing Letters, Vol. 8, Nr. 4 (1998), 459–471.

5. PHRASE parsers for multi-axiom grammars, by Teodor Rus and Jim Jones, Theoretical Computer Science, Volume 199, Number 1–2, pages 199-229, April 1998.

6. Algebraic processing of programming languages, Theoretical Computer Science, Volume 199, Number 1–2, pages 105-143, April 1998.

7. Using graph coloring in an algebraic compiler, by Teodor Rus and Sriram Pemmaraju, Acta Informatica, 1997, Volume 34, Number 3, 191-209.

8. "Editorial", by G. Scollo and T. Rus, *Theoretical Computer Science*, Volume 140, Number 1, 1995, 1-3.

9. "Algebraic Tools for Language Processing", by T. Rus and T. Halverson, *Computer Languages*, Volume 20, Number 4, 1994, 213-238.

---

[1]Reviews of my papers and books are published by "Zentralblat für Mathematik", "Mathematical Reviews", and "Computer and Information Systems", and are recorded here as **Zbl: Volume #Number**, **MR:Volume #Number**, and **C&IS: Volume #Number** respectively.

10. "Algebraic Methodology and Software Technology", invited paper for the *Encyclopedia of Computer Science and Technology*, Volume 30, Allen Kent and James G. Williams Editors, Marcel Dekker, Inc., New York 1994, 1-33.

11. "Editorial", *Theoretical Computer Science*, **112**, May 1993, 1–5, issue dedicated to second AMAST conference held on May 22-25, 1991, Iowa City, Iowa.

12. "Algebraic Construction of Compilers", *Theoretical Computer Science*, **90**, December 1991, 271-308.

13. "Editorial", *Theoretical Computer Science*, **77**, 1990, 1-3, issue dedicated to first AMAST conference held on May 22-24, 1989, Iowa City, Iowa.

14. "Parsing Languages by Pattern Matching", *IEEE Transactions on Software Engineering*, Volume 14, Number 4, 1988, 489-511.

15. "An Algebraic Model for Programming Languages", *Computer Languages*, Volume 12, No. 3/4, 1987, 173-195.

16. "TICS System: A Translator Generator", *Libertas Mathematica*, Volume VII, 1987, 24-45.

17. "Semantic Specification by Has-Hierarchy", *Studii şi Cercetări Matematice*, Bucharest, Volume 34, Number 2, 1982, 382-387. **Zbl: 491 #68008**, **MR: 84g #68014**.

18. "Technology for Programming Language Specification and Implementation", *Mathematica*, Volume 23(46), Number 1, 1981, 273 - 295. **Zbl: 511 #68004**, **MR: 83j #68009**.

19. "Finite Representation of Context-Free Languages", *Studii şi Cercetări Matematice*, Bucharest, Volume 33 Number 2, 1981, 257 - 275. **Zbl: 472 #68036**, **MR: 83f #68090**.

20. "HAS-Hierarchy: A Natural Tool for Language Specification", *Ann. Soc. Math. Polonae, Series IV: Funadamenta Informaticae*, Volume 3, Number 3, 1980, 269 - 294. **Zbl: 452 #68087**, **MR: 82k #68046**, **C&IS: 27, 2/3#81-03197**.

21. "The GP of Modeling, or the Education of the Applied Mathematical Modeler", by C. M. I. Rattray and T. Rus, [2] *Mathematica*, Volume 22(45), Number 2, 1980, 309 - 332. **Zbl: 537 #68047**, **MR: 83g #00026**.

22. "Abstract Data Types in Communication System Languages", by L. J. Miller and T. Rus, *Mathematica*, Volume 21(44), Number 1, 1979, 43 - 56. **Zbl: 421 #68023**, **MR: 82a #68024**.

23. "HAS-Hierarchy: A Mathematical Device for Computer System Modeling", by T. Rus and C. M. I. Rattray, *Mathematica*, Volume 20(43), Number 2, 1978, 177 - 192. **Zbl: 457 #68002**.

24. "The Representation of the Operator Schemes defined by Context-Free Grammars", by T. Rus and M. Sularie, *Studii şi Cercetări Matematice*, Bucharest, Volume 20, Number 1, 1976, 79 - 94. **MR: 54 #11864**, **C&IS: 15, 10#156776**.

---

[2]The authors of the papers published in *Studii şi Cercetări de Matematică* and *Mathematica* 1960-1975, are listed in alphabetical order.

25. "Context-Free Algebra", by W. S. Hatcher and T. Rus, *Journal of Cybernetics*, Volume 6, Number 1-2, 1976, 65 - 77. **Zbl: 362 #68107**, **MR: 57 #14621 68A30**, **C&IS: 16, 4#171574**.

26. "Context-Free Algebra: A Mathematical Device for Compiler Specification", *Lecture Notes in Computer Science* **45**, Mathematical Foundation of Computer Science, (G Goos & J. Hartmanis, Ed.), 1976, 488-494.

27. "Some Observations Concerning the Algebraic Treatment of the Formal Languages", *Revue d'Analyse Numerique et de la Theorie de l'Approximation*, Volume 4, Number 2, 1975, 179 - 200. **Zbl: 382 #68066**, **MR: 58 #32142 68A30**.

28. "Some Observations Concerning the Application of Trees Theory to System Generation", *Revue d'Analyse Numerique et de la Theorie de l'Approximation*, Volume 3, Number 1, 1974, 93 - 111. **Zbl: 353 #68043**, **MR: 52 #9667 68A05**.

29. "Interaction Relations in a Coroutine System", by A. Prodan and T. Rus, *Revista de Analiza Numerică şi Teoria Aproximaţiei*, Volume 3, Number 2, 1974, 178-201. **MR: 53 #12064 68A05**.

30. "An Algebraic Approach to Data Organization", by T. Rus and U. Sinn, *BIT*, Volume 14, 1974, 460 - 481. **Zbl: 295 #68038**, **MR: 50 #12419 9404**.

31. "ΣS-Algebra of a Formal Language", *Bul. Math. de la Soc. de Science, Bucharest*, Volume 15(63), Number 2, 1972, 227 - 235. **Zbl: 263 #68042**, **MR: 51 #7383 68A30**.

32. "Langage Formalises et Systemes Formals", *Chaiers de Linguistique Theorique et Appliquees*, Bucharest, Volume XIV, 1968, 211 - 217.

33. "On the Recursiveness of the Formal Languages", *Revue Roumaine de Mathematiques Pures et Appliquees*, Bucharest, Volume XII, Number 8, 1968, 1159 - 1172. **Zbl: 207 #16**, **MR: 39 #2623**.

34. "An Algebraic Approach for Formal Language Specification", *Studii şi Cercetări Mate-matice*, Bucharest, Volume 19, Number 2, 1967, 259-272. **Zbl: 227 #68034**, **MR: 39 #2549**.

35. "The Algebra of a Formal Language", *Studii şi Cercetări Matematice*, Bucharest, Volume 19, Number 9, 1967, 1309 - 1324. **MR: 40 # 5362**.

36. "Observations Concerning Computer Application to Solve Non-Numerical Problems", *Mathematica*, Volume 9(32), Number 2, 1966, 343-360. **Zbl: 155 #21**.

37. "An Interpreter for DACICC-1", *Studii şi Cercetări Matematice*, Bucharest, Volume 18, Number 6, 1966, 725 - 736.

38. "Implementing Decision Operations on Trees", *Studii şi Cercetări Matematice*, Bucha-rest, Volume 17, Number 2, 1965, 311 - 319. **MR: 37 #3955**.

39. "Algorithms for Algebraic Computations", *Studii şi Cercetări Matematice*, Bucharest, Volume 17, Number 10, 1965, 1489 - 1504.

40. "On Matrix Representations of Trees", *Studii şi Cercetări Matematice*, Bucharest, Volume 16, 1964, 1179-1185. **MR: 34 #100**.

41. "The Equivalence of the Trees and Explicit Schemata", *Studii şi Cercetări Matematice*, Bucharest, Volume 17, Number 9, 1965, 1428 - 1439. **MR: 38 #4242**.

42. "On a Formal System I", *Studii şi Cercetări Matematice*, Bucharest, Volume 15, Number 4, 1964, 459 - 470. **Zbl: 199 #3**, **MR: 32 #3991**.

43. "On a Formal System II", *Studii şi Cercetări Matematice*, Bucharest, Volume 15, Number 5, 1964, 595 - 615. **Zbl: 199 #3**, **MR: 32 #3991**.

44. "Symbolic Processing Algorithms", *Studii şi Cercetări Matematice*, Bucharest, Volume 15, Number 9, 1964, 1129 - 1139.

45. "Matrix Representation of Trees", *Mathematica*, Acad. R.P.Române, Cluj, Volume 6(29), Number 2, 1964, 327 - 334.

46. "Towards Programming of Numerical Integration Formulas", by L. Negrescu and T. Rus, *Studii şi Cercetări de Matematică*, Acad. R.P.Române, Cluj, Volume XIV, Number 2, 1963, 323 - 340.

47. "A Sparse Matrix Programming Package", *Studii şi Cercetări de Matematică*, Acad. R. P. Române, Cluj, Volume XIV, Number 2, 1963, 405 - 416.

48. "Programming of Numerical Computations by Interpolation", by B. Janko and T. Rus, *Studii şi Cercetări de Matematică*, Acad. R.P.Române, Cluj, Fascicula Anexă, Volume XIII, 1962, 91 - 104.

49. "A Programming Approach of the Sparse Matrix Multiplication", by E. Munteanu and T. Rus, *Studii şi Cercetări de Matematică*, Acad. R.P. Române, Cluj, Fascicula Anexă, Volume XIII, 1962, 154 - 160.

50. "Sur les Solutions Positives d'un System d'Equation Lineaires", by L. Negrescu, A. Nemeth, and T. Rus, *Mathematica*, Acad. R.P. Române, Volume 4(27), Number 1, 1962, 65 - 69. **MR: 28 #103**.

51. "Programming Sparse Matrix Operations", *Communications of the Romanian Acade-my*, Volume XII, Number 12, 1962, 1273 - 1277. **MR: 27 #3101**.

52. "Automatic Recovery from Fixed Point Overflow", by E. Munteanu and T. Rus, *Communications of the Romanian Academy*, Volume XI, Number 12, 1961, 1455 - 1457.

53. "On a Pair of Congruence", *Studii şi Cercetări de Matematică*, Acad. R.P.Române, Cluj, Volume 12, 1961, 357-366. **MR: 30 #5196**.

54. "Positive Solutions of a System of Linear Equations", by L. Negrescu, A. Nemeth, and T. Rus, *Studii şi Cercetări de Matematică*, Acad. R.P.Române, Cluj, Volume 13, 1962, 123-127. **MR: 31 #2261**.

55. "On Barycentric Subdivisions of n-Dimensional Euclidean Simplexes", *Studii şi Cerce-tări de Matematică*, Acad. R.P.Române, Cluj, Volume 12, 1961, 367-375. **MR: 30 #5289**.

56. "On the Distribution of Centroids in a Triangle", *Mathematical and Physical Journal (GMF) Series A* Romanian Society of Mathematics, Bucharest, Volume 12(65), Number 7, 1960, 298-301. **MR: 23 #A1256**.

3.4   Refereed conference papers

1. "Application Driven Software Development", by T. Rus and D.E. Curtis. *International Conference on Software Engineering Advances, ICSEA 2006*, Proceedings, October 29–Novenber 3, 2006.

2. "Domain-Oriented Component-Based Automatic Program Generation", Proceedings of the International Conference on Advances in the Internet, Processing, Systems, and Interdisciplinary Research", IPSI-03, Sveti Stefan, Montenegro, October 4-11, 2003.

3. "Algebraic definition of programming languages", by T. Rus. Twente Workshop on Language Technology, TWLT 16, Proceedings of the Algebraic Methods in Language Processing, AMiLP2000, 20–22 May 2000, Iowa City , pages 223–232.

4. "SEL: a semantics specification language", by Teodor Rus and Robert Kooima, available at the URL `http://www.cs.uiowa.edu/~rus`

5. "TICS: A Component-Based Language Processing Environment", by Teodor Rus, Robert Kooima, Radu Soricut, Stefan Munteanu, and James Hunsaker, available at the URL `http://www.cs.uiowa.edu/~rus`

6. "An algebraic language processing environment", by Teodor Rus, Tom Halverson, Eric Van Wyk, and Robert Kooima, Proceedings of AMAST'97, Lecture Notes in Computer Science 1349, pages 581-585.

7. "Integrating temporal logics and model checking algorithms, by Teodor Rus and Eric Van Wyk, Fourth AMAST International Workshop on Real-Time Systems, Proceedings, May 21-23, 1997, Mallorca, Spain, available at http://www.cs.uiowa.edu~rus.

8. "Model checking as a tools used by parallelizing compilers", by Teodor Rus and Eric Van Wyk, Second International Workshop on Formal Methods for Parallel Programming: Theory and Applications, Proceedings, 1 April 1997, Geneva, Switzerland. This paper is also available at http://www.cs.uiowa.edu/~rus.

9. "A formal approach to parallelizing compilers", By Teodor Rus and Eric Van Wyk, *SIAM Conference on Parallel Processing for Scientific Computation, Proceedings*, 14 March 1997, Minneapolis, Minnesota, available at http://www.cs.uiowa.edu/~rus.

10. "Machine independent computation construct specification, by Teodor Rus, Thomas Halverson, and Shri Borde, Workshop MSPLS, 5 October 1996, Madison, Wisconsin.

11. "Synthesizing real-time programs from CoRE specifications", by Teodor Rus and Hatem Abu-Dagga, Proceedings of Third AMAST Workshop on Real-Time Systems, 6-8 March 1996, Salt Lake City, Utah, page 47–59.

12. "Algebraic implementation of model checking algorithms", by Teodor Rus and Eric Van Wyk, Proceedings of Third AMAST Workshop on Real-Time Systems, 6-8 March 1996, Salt Lake City, Utah, pages 267–279, available at http://www.cs.uiowa.edu/~rus.

13. "Algebraic Processing of Programming Languages", by T. Rus, Proceedings of Twente Workshop on Language Technology, TWLT 10, December 6-8, 1995, Enschede, The Netherlands, page 1-42.

14. "Multi-layered Pipeline Parsing from Multi-axiom Grammars", by T. Rus and J.S. Jones, Proceedings of Twente Workshop on Language Technology, TWLT 10, December 6-8, 1995, Enschede, The Netherlands, page 65-82.

15. "Software Development for High Performance Computing", by T. Rus and A. Fleck, Symposium "America in the Age of Information: A Forum on Federal Information and Communications R&D", July 6-7, 1995, Lister Hill Center, Bethesda, Maryland.

16. "Real-Time Program Synthesis from Specifications", by A. Cornell, J. Knaack, A. Nangis, T. Rus, Proceedings of the *The Third International Conference on Algebraic Methodology and Software Technology, AMAST'93*, June 22-25, 1993, Enschede, The Netherlands, Springer Verlag 1994, 237-244.

17. "Parallel Programming Environments for High Performance Computing Systems", by T. Rus and R. Marciano, *The 6-th ACM International Conference on Parallel and Distributed Computing Systems*, October 1-3, 1992, Pittsburgh.

18. "Algebraic Alternative for Compiler Construction", *The Unified Computation Laboratory*, C.M.I. Rattray and R.G. Clark Editors, 1992 The Institute of Mathematics and its Applications, Oxford University Press 1992, 27-62.

19. "TwoLev: A Two Level Scanner", by J. Knaack and T. Rus, *Workshop in Computing Series*, Springer-Verlag, London 1992, 264-276.

20. "Algebraic Construction of Program Representation Graphs", by R. Marciano and T. Rus, *Workshop in Computing Series*, Springer-Verlag, London 1992, 529-546,

21. "A Two Level Scanning Algorithm", by J. Knaack and T. Rus, *Proceedings of the Second International Conference on Algebraic Methodology and Software Technology*, May 22-25, 1991, 175-179.

22. "Algebraic Construction of Program Representation Graphs", by R. Marciano and T. Rus, *Proceedings of the Second International Conference on Algebraic Methodology and Software Technology*, May 22-25, 1991, 317-321.

23. "Parallel Implementations of Simplex Algorithm", by T. Rus and R. Marciano, *Proceedings of 2nd Symposium on the Frontiers of Massively Parallel Computation*, October 10-12, 1988, George Mason University, Fairfax, Virginia, 85-92.

24. "Language Specification by Multi-Axiom Grammars", by T. Rus and J. LePeau, *Proceedings of the IEEE Computer Society International Conference on Computer Languages*, October 9-13, 1988, Castle Hotel and Resort, Miami Beach, Florida, 110-118.

25. "Language Support for Parallel Programming", *Proceedings of COMPSTAN'88*, The Computer Standards Conference 1988, March 21-23, 1988, Washington, D.D., 91-99.

26. "Algebraic Modeling of a Translator", *Proceedings of the Fifteenth International Association of Science and Technology for Development*, IASTED, International Conference Applied Simulation and Modeling, May 27-29, 1987, Santa Barbara, Ca., 65-68.

27. "An Algebraic Approach for Assembler Construction", by T. Rus and K. Hansen, *Proceedings of the ACM Computer Science Conference*, CSC'86, February 4-6, 1986, Cincinnati, Ohio, 489.

28. "An Alternative to CF Grammar for Language Specification", *Proceedings of the IEEE Computer Society International Conference on Computer Languages*, October 27-30, 1986, Miami Beach, 144-155.

29. "HAS-Hierarchy: A Mathematical Device for Computer System Modeling", by C. M. I. Rattray and T. Rus, *Proceedings of the First International Conference on Mathematical Modeling*, August 29-September 1, 1977, Missouri-Rolla, Volume 1, 269-283,

30. "Context-Free Algebra: A Mathematical Device for Compiler Specification", *Proceedings of the Symposium on Mathematical Foundation of Computer Science*, MFCS-1976, September 6-10, 1976, Gdaǹsk, Lecture Notes in Computer Science **45**, 1976, 488 - 494.

31. "Towards a Software Construction Technology having a Theoretical Basis", by T. Rus and C. M. I. Rattray, *Proceedings of On Line Conference on Software System Engineering*, Uxbridge, 1976, 169 - 192.

32. "The Recursivity of Context-Free Languages", *Actes du X-e Congres Internationnel des Linguistes*, Bucharest, August 28 - September 2, 1967, Volume 17, 1970, 919-925.

33. "A Linear Programming Package for Agricultural Applications", *Proceedings of Coloc-viul de Aplicaţii ale Matematicii in Agricultură*, Agriculture Institute of the Romanian Academy, ICCA-ICEA, Bucharest 1968, pages: 50.

34. "The Multiprogramming System of the DACICC-200 Computer", [3], by T. Rus and E. Munteanu, *Proceedings of Colocviul de Teoria Funcţiilor Convexe şi Analiză Numerică*, Cluj, 1967, pages: 15.

35. "Block Structure of the PAS Programming Language", *Proceedings of Colocviul de Teoria Funcţiilor Convexe şi Analiza Numerică*, Cluj, 1967, pages: 10.

36. "A Compiler Description Language", *Proceedings of Colocviul de Teoria Funcţiilor Convexe şi Analiză Numerică*, Cluj, 1967, pages 11.

---

[3]DACICC-200 is the name of the Romanian computer constructed at the Computing Institute of the Romanian Academy, Cluj-Napoca, 1964-1968.

3.5 Papers published on the web

The following papers have been published at the URL `http://www.cs.uiowa.edu/~rus`:

1. A process based application development system, by Teodor Rus, Spring 2004.

2. Domain-Oriented Component-Based Automatic Program Generation, by Teodor Rus, Fall 2003.

3. A unified language processing technology, by Teodor Rus, Spring 2002.

4. Natural language processing, by Teodor Rus, Spring 2001.

5. Generating model checker from algebraic specifications, by Teodor Rus, Eric Van Wyk, and Tom Halverson, Spring 2000.

6. Algebraic definition of programming languages, by Teodor Rus, Fall 2000.

7. TICS: A Component-Based Language Processing Environment, by Teodor Rus, Robert Kooima, Radu Soricut, Stefan Munteanu, and James Hunsaker, slides of the paper presented at MSPLS, Chicago, October 6, 1999.

8. SEL: a semantic specification language, by Teodor Rus and Robert Kooima, Fall 1999.

9. A language independent scanner generator, by Teodor Rus and Tom Halverson, Spring 1999.

10. A transition semantics specification language, by Teodor Rus and Robert Kooima, Fall 1998.

11. Semantics specification in an algebraic compiler, by Teodor Rus and Robert Kooima, Spring 1998.

3.6 Publications in preparation

1. System Software and Software Systems – Concepts and Methodology – Volume 3: Programming Support Environment, World Scientific.

2. Domain-Oriented Ontology-Based Software Development, Fall 2004.

3. Software architectures based on stand-alone software components, by Teodor Rus and Thomas Halverson.

4. A database for stand-alone compiler components, by Teodor Rus and Radu Soricut.

5. The interface manager of an algebraic compiler, by Teodor Rus and Stefan Munteanu

6. Incremental development of language semantics, by Teodor Rus and Robert Kooima.

3.7   Technical reports

1. A transition semantics specification language, by T. Rus and R. Kooima, *Technical Report 98-01*, The University of Iowa, Department of Computer Science, May 1998, 38 pages.

2. "The Environment of an Algebraic Compiler", by T. Rus and J. Knaack, *Technical Report 93-04*, The University of Iowa, Department of Computer Science, April 1993, 77 pages.

3. *Steps Towards Algebraic Construction of Compilers*, Technical Report LITP90.69, Institute Blaise Pascal, Université Paris 6-7, 4, Place Jussieu, 75252 Paris Cedex 05, France, 76 pages.

4. *Algebraic Construction of a Compiler*, Technical Report 90-01, The University of Iowa, Department of Computer Science, April 1990, 112 pages.

5. *Interactive Parser Construction*, by J. P. LePeau and T. Rus, Technical Report 88-02, Department of Computer Science, The University of Iowa, Iowa City, 88 pages.

6. *An Interactive Parser Generator*, IPG, User manual, by J. LePeau and T. Rus, The University of Iowa, Department of Computer Science, Computer Science Laboratory, April 1986, 20 pages.

7. *Fast Pattern Matching In Strings*, Technical Report 85-01, The University of Iowa, Department of Computer Science, January 1985, 30 pages.

8. *An Inductive Approach for Program Evaluation*, Technical Report 85-02, The University of Iowa, Department of Computer Science, May 1985, 96 pages.

9. *An Algebraic Directed Compiler Generator*, by T. Rus and F. B. Herr, Technical Report 84-02, The University of Iowa, Department of Computer Science, July 1984, 60 pages.

10. *TICS-System: A Compiler Generator*, Technical Report 83-80, The University of Iowa, Department of Computer Science, November 1983, 39 pages.

11. *Abstract Data Type Implementation for Ada Like Languages*, by T. Rus and C. M. I. Rattray, Tech. Report Number 3, October 1980, Dept. of Computing Science, University of Stirling, Stirling, Scotland, U.K., 28 pages.

12. *The Ada Spirit: An Algebraic View of Ada Like Languages*, by T. Rus and C. M. I. Rattray, Tech. Report Number 4, November 1980, Dept. of Computing Science, University of Stirling, Stirling, Scotland, U.K., 30 pages.

13. *Language Specification by Generators and Relations*, Volume 3, Technical Report, ITC-Filiala Cluj, Cluj-Napoca, December 1977, 350 pages.

14. *Language Specification by Generators and Relations*, Volume 2, Technical Report, ITC-Filiala Cluj, Cluj-Napoca, May 1977, 280 pages.

15. *Structure Algebriques, Compilation et Programmes Structurees: vers une Technologie de Construction de Compilateurs*, by C. M. I. Rattray and T. Rus, Report de Recherche Number 40, August 1976, Université Scientifique et Medicale de Grenoble, Laboratoire d'Informatique.

16. *Language Specification by Generators and Relations*, Volume 1, Technical Report, ITC-Filiala Cluj, Cluj-Napoca, November, 1976, 250 pages.

17. *The Operating System of a Computer System*, Technical Report, Mathematisches Institut für Angewandte Mathematik, Universität des Saarlandes, Saarbrücken, A-72-1, 1972, 300 pages.

18. *PAS, The Assembly Language of DACICC-200 Computer*, User Manual, ICCA-ICEA, Bucharest, 1969, 120 pages.

3.8   Reviews published in Computing Reviews

1. Plausibility measures and default reasoning By N. Friedman and J.Y. Halpern Journal of the ACM, Volume 48, Number 1 (July 2001), pp. 648-685. CR 102-mm-xxxx.

2. Patrick J. H., *The Open VMS User's Guide, Second edition*, Digital Press, 1998, CR 98-12-0942.

3. Patrice B. and Insup L., " A process algebra of communicating shared resources with dense time and priorities", *Theoretical Computer Science* 1997:**189**, 1–219 CR 98-09-0721

4. Leininger, K.E. and Ranade, J., *Solaris developer's tool kit*, McGraw-Hill, Inc., CR 98-mm-xxxx.

5. Blikle, A., *Why denotational? Remarks on applied denotational semantics*, Fundamenta Informaticae, 28(1996), 55–85, CR 97-mm-xxxx.

6. Escardó, M., *PCF extended with real numbers*, Theoretical Computer Science 162 (1966), 79–115, CR 97-mm-xxxx

7. Exner, G.R., *An accompaniment to higher mathematics*, Springer-Verlag 1996, CR 97-05-0337

8. Pande, S., Agrawal, P., and Mauney, J., *A scalable scheduling scheme for functional parallelism on distributed memory multiprocessor systems*, IEEE Transactions on Parallel and Distributed Systems **6**:4, 1995, 388–399, CR 96-11-0910

9. B. Blakeley, H. Harris, and R. Lewis, *Messaging and Queuing Using MQI*, McGraw-Hill Series on Computer Communications, 1995, CR 96-07-0466 [4].

10. A.-C. Caron and J.-L. Coquide, "Decidability of reachability for disjoint union of term rewriting systems", *Theoretical Computer Science* **126**:1, 31-52, CR 96-09-0723.

11. H.A. Cameron and D. Wood, "Pm Numbers, Ambiguity, and Regularity", *Informatique Théorique et Applications / Theoretical Informatics and Applications*, **27**:3, 1993, 261-275. CR 95-xx-xxxx.

12. Gelenbe, E. and Hernandez, M., "Virus tests to maximize availability of software systems", *Theoretical Computer Science* **125:1**, 131-147, CR 95-05-0319

---

[4]The coordinates of a review in CR are specified by CR yy-mm-nnnn where yy is the volume and coincides with the year, mm is the issue and coincides with the month, and nnnn is the number of the review in that issue

13. A.M. Lister and R.D. Eager, *Fundamentals of Operating Systems*, Fifth Edition, Springer-Verlag, New York, 1993. CR 94-10-0687.

14. T.E. Anderson, B.N. Bershad, E.D. Lazovska, "Scheduler Activations: Effective Kernel Support for User Level Management of Parallelism", ACM Transactions on Computer and Systems, **10**:1, 1992, 53-79. CR 94-05-0305.

15. Y-P. Nihal and V. Jean-Marc, "Stochastic Bounds on Execution Times of Parallel Programs", *IEEE Trans. Softw. Eng.*, **17**:10, 1991, CR 92-11-0865

16. J. van Leeuwen, Managing Editor, *Handbook of Theoretical Computer Science*, Volume A: Algorithms and Complexity, Volume B: Formal Models and Semantics, The MIT Press, 1991, CR 92-09-0659.

17. Horowitz S., Reps T., Binkley D., "Inter-procedural Slicing Using Dependence Graphs", *ACM Transactions on Programming Languages and Systems*, **12**:1, 1990, 26-60, CR 91-05-0370.

18. Back R.J.R., von Wright J., "Duality in Specification Languages: A Lattice-theoretical Approach", *Acta Informatica* **27**, 1990, 583-625, CR not known.

19. Grimbomont, E.P., "Stepwise Refinement and Concurrency: The Finite-State Case", *Science of Computer Programming*, **14**, 1990, 185-228, CR not known.

20. Backhouse, Roland, et al: "Do-it-Yourself Type Theory", Volume 31, Number 7, 368-369, CR 90-07-0557.

21. Henessy, Matthew: *Algebraic Theory of Processes*, MIT Press 1988, Volume 30, Number 12., 624-625, CR 98-12-0859.

22. Wegner, Peter: "The Object-Oriented Classification Paradigm", Volume 30, Number 4, 210-211, CR 89-04-0223.

23. Tare, Ramkrishna: *UNIX Utilities: a programmer's reference*, Volume 29, Number 7, CR 88-07-0573.

24. Hassan, Ait-Kaci: "An Algebraic Semantics Approach to the Effective Resolution of Type Equations", Volume 29, Number 3, CR 88-03-0204.

25. Agha, Gul: *Actors: a Model of Concurrent Computation in Distributed Systems*, Mit Press 1986, Volume 28, Number 8, 398-399, CR 87-08-0624.

26. Bucher, W.: "A Regularity Test for Dual Bordered OS Systems", Volume 28, Number 7, 378, CR 87-07-0587.

27. Clarck, Chris and Jones, Simon L. P.: "Strictness Analysis - a Practical Approach", Volume 27, Number 11, 562, CR 86-11-1009.

28. Sherman, M.S.: *PARAGON: a Language Using Type Hierarchies for the Specification, Implementation, and Selection of Abstract Data Types*, Volume 27, Number 2., 55, CR 86-02-0082.

29. Gabriel, R.P.: *Performance and Evaluation of Lisp Systems*, MIT Press, 1985, Volume 27, Number 8, 382, CR 86-08-0062.

30. Narain Gehani: *Ada Concurrent Programming*, Prentice Hall, 1984, Volume 26, Number 3, 151-152, CR 85-03-0159.

31. Ehrenfeucht, A., Rozenberg, G.: "Repetitions of Subwords in DOL Languages", Volume 26., Number 5, 294, CR 85-05-0424.

32. Heliard, P. G.: "Compiling Ada", Volume 26., Number 8, 448-449, CR 85-08-0716.

33. Fehr, E.: "Expressive Power of Typed and Type-Free Programming Languages", Volume 26., Number 9, 509-510, CR 85-09-0834.

34. Atkinson, M.P., Bailey, P.J., Chisholm, K.J., Cockshott, P.W., Morrison, A.: "An Approach to Persistent Programming", Volume 25, CR 84-07-0548.

35. Ibarra, O.H., Leninger, B.S: "On Simplification and Equivalence Problems for Straight-Line Programs", Volume 25, CR 84-10-0843.

36. Wirsing, M., Broy, M.: "An Analysis of Semantic Models for Algebraic Specifications", Volume 24, Number 11, 484-485, CR 83-11-40,820.

3.9   Invited lectures

1. Component Based MT Systems, talk given at the Tier 1 Integrated Concept Team (ICT) meeting for Machine Language Translation (MLT) organized by the United States Army Intelligence Center and Ft Huachuca, 5–9 November 2001, Sierra Vista, Arizona.

2. Natural Language Processing, talk given to the students on "Applied Mathematics and Computational Sciences", 20 October 2000.

3. A component-based language processing environment, Computing Laboratory, Oxford University, U.K., 20 May 1999.

4. Computer Science: past and future, a Doctor Honoris Causa Discourse, Lucian-Blaga University, Sibiu, Romania, May 1998.

5. Program generation from specifications, Lucian-Blaga University, Sibiu, Romania, May 1996

6. Algebraic implementation of model checking algorithms, University of Nantes and University of Bordeaux, France, June 1996.

7. Program Generation from Specifications, Applied Mathematics, 17 November 1995.

8. *Algebraic Processing of Programming Languages*, First AMAST Workshop on Language Processing, AMiLP'95, December 6-8, 1995, University of Twente, Enschede, The Netherlands.

9. *Computation Specification by Semantic-Driven Automata*,

   (a) Seminar "Logic, Algorithms, and Databases", LITP, University of Paris-7, June 3, 1992.

(b) University of Ottawa, Department of Computer Science, Canada, May 12, 1992.

10. *Parallel Programming Environments*

    (a) Computer Science Department, Brigham Young University Provo, Utah, March 24, 1992.
    (b) University of Michigan, EECS Department, 1301 Beal Avenue, Ann Arbor, Michigan, November 27, 1991.

11. *Algebraic Construction of Compilers*

    (a) University of Twente, Enschede, The Netherlands, May 11, 1990.
    (b) Technische Universität Berlin, Institut für Software und Theoretische Informatik, West Berlin, June 7, 1990.
    (c) ONR Workshop on Programming Languages, University of Utah, Salt Lake City, July 10-14, 1990.
    (d) Computer Science Department, Brigham Young University Provo, Utah, March 19, 1991.

12. *Algebraic Tools for Software Development*, The Institute of Mathematics and its Applications, Conference on The Unified Computation Laboratory, University of Stirling, Stirling, Scotland, July 3-6, 1990.

13. *Steps Toward Algebraic Construction of Compilers*

    (a) Aarhus University, Aarhus, Denmark, May 14, 1990.
    (b) Université d'Orsey, Paris, May 22, 1990.

14. *Non-Conventional LR-Parsing Algorithms*, June 1, 1990, Universität des Saarland, Informatik, Saarbrücken, West Germany.

15. *Language Processing Tools for Compiler Development*, Invited Seminar, IBM Toronto, July 15, 1989.

16. *Algebraic Tools for Programming Language Development* University of San Diego, La Jolla, May 12, 1989.

17. *Trends in Programming Language Development*, Cordis Corporation, Florida, October 12, 1988.

18. *Algebraic Compiler Optimization*, Pyramid Technology Corporation, Mountain View, California, December 18-th, 1987.

19. *Algebraic Compiler Generation*, Kansas State University, Manhattan, Kansas, November 12, 1987.

20. *TICS System: An Alternative for Compiler Generation*, Incremental Systems Inc., Pittsburgh, June, 1987.

21. *Algebraic Compiler Construction*, Catholic University of Nijmegen, January, 1981.

22. *Towards a Software Construction Technology*, University of Erlangen, Department of Electrical and Computer Engineering, Erlangen, 1977.

23. *The Architecture of a Computer System*, Department of Computer Science, University Laval, Quebec, April 1975.

24. *Heterogeneous Algebra, a Formal Device for Semantic Specification*, University of Saarlandes, Saarbrücken, May 1975.

25. *TICS-System: A Compiler Generator*, University of Grenoble, Grenoble, May 1975.

26. *Heterogeneous Algebra, a Device for Programming Language Specification*, Queen Mary College, London, April 1972.

27. *The Architecture of a Multiprogramming System*, University of Pisa, September 1968.

28. *Algebraic Methods for Language Characterization*, University of Pisa, September 1968.

3.10 Grant proposals

1. Integrating Computer Education with Ontology Engineering, PI., June 2005, submitted to NSF, (not funded).

2. A Process Based Application Development System, PI., March 2-nd, 2004, submitted to NSF, (not funded).

3. Hands-On High Performance Computing Education, PI., June 2003, submitted to Carver Foundation, (not funded).

4. A unified language processing technology, Carver Foundation, November 2000 (funded).

5. TICS: A Component-Based Software Development Technology, by Teodor Rus, PI, Department of Computer Science, The University of Iowa, Iowa City, Giuseppe Scollo, Co-PI, Dep't of Maths and Computer Science, University of Catania, Italy, Tom Halverson, Co-PI, Department of Computer Science, Dakota State University, Madison, John Knaack, Co-PI, ColorSpan Corporation, Eden Prairie, Minnesota, submitted to NSF ITR program, (not funded).

6. Grant Proposal Seeking Support for the Organization of the 8-th International Conference on Algebraic Methodology And Software Technology, AMAST 2000, by Teodor Rus, submitted to ONR, October 1999 (funded).

7. Proposal for AMAST Anniversary Meeting, by Teodor Rus, submitted to NSF, August 1999, (funded).

8. Ontology-Based Information Discovery, D. Eichmann PI, T. Herman, T. Rus, P. Srinivasan, Co PI, submitted to NSF, May 1998, (not funded).

9. An algebraic infrastructure for language processing, submitted to DARPA, 2 January 1998, (not funded).

10. TICS: An Experimental Software System Development Methodology, submitted to NSF, 6 December 1997, (not funded).

11. Building on Practical Skills and Theoretical Foundations, Submitted to Department of Defense, National Security Education Program (NSEP), 17 April 1997. (not funded)

12. A Formal Methodology for Program Parallelization, Submitted to NSF, 7 March 1997, (not funded).

13. An Infrastructure for Complex Software, Submitted at NSF, 7 January 1997. (not funded)

14. Algebraic Infrastructure of Compilers, Submitted at ARPA, 20 March 1996. (not funded)

15. The Third International AMAST Workshop on Real-Time System Development, Submitted to ONR, November 1995. (funded).

16. Parallel Programming Consortium Enabling Education in Parallel Computing at the Undergraduate Level, PI, F. Potra and J. Brown, Co PI. Submitted at NSF, November 1994, (funded).

17. Proposal for AMAST international cooperative research activity: long-term plan, PI. Submitted to NSF, January 1995, (not funded).

18. Proposal for AMAST international cooperative research activity 1995, PI. Submitted to ONR, (funded).

19. "Open Environments for Parallel Programming", PI. Submitted to ARPA January 1994, BAA 94-03, (not funded).

20. "A Multi-Media System for Teaching Software", PI. Submitted to the University of Iowa Council of Teaching, January 1994, (not funded).

21. "Real-Time Program Synthesis from Specifications", PI. CIFRE, 1994, (not funded).

22. "Parallel Programming Environments for High Performance Computing Systems", PI. Submitted to NSF November 1992, (not funded).

23. "Technology for Parallel Program Development", PI. Carver Foundation 1993, (not funded).

24. "First International Workshop on Real-Time Programming", PI. Submitted to ONR and NSF, March 30-th, 1993, (funded).

25. "Third International Conference on Algebraic Methodology and Software Technology", PI. Submitted to ONR and NSF, June 1992, (funded).

26. "Parallel Programming Environments for High Performance Computing Systems", PI. Submitted to DARPA, BAA9207, May 1992, (not funded).

27. "Parallel Programming Environments for High Performance Computing Systems", PI. Submitted to DOE, January 1992, (not funded).

28. "Parallel Programming Environments for High Performance Computing Systems", PI. Submitted to NSF, January 1992, (not funded).

29. "Algebraic Processing of Query Languages", PI. Submitted to NSF on January 1990, (not funded).

30. "Second International Conference on Algebraic Methodology and Software Technology", PI. Submitted to ONR and NSF, January 1990, (funded).

31. "Parallel Processing of Computer Languages", PI. Submitted to DARPA, January 1989, (not funded).

32. "Algebraic Construction of a Compiler", PI. Submitted to ONR, October, 1988, (not funded).

33. "Parallel Programming Environments", PI. Submitted to ONR, October 1988, (not funded).

34. "Algebraic Processing of Query Languages", PI. Submitted to ONR, October 1988, (not funded).

35. "Parallel Programming Environments", PI. Submitted to ONR, October 1988, (not funded).

36. "Algebraic Processing of Query Languages", PI. Submitted to ONR, October 1988, (not funded).

37. "Algebraic Processing of Query Languages", PI. Submitted to Center of Excellence in Space in Space Data and Information Science, CESDIS, March 29, 1988, (not funded).

38. "Parallel Programming Environments", PI. Submitted to NSF Research Initiation Awards, January 4, 1988, (not funded).

39. "Symposium on Algebraic Methodology and Software Technology, AMAST", PI. Submitted to NSF and ONR, April 14, 1988, (funded).

40. "Highly Innovative Software Development", PI. Submitted to DOD, January 1986, (not funded).

41. "A Mobile Interactive Symbolic Computation System", Co PI. in the Divisional proposal Emphasis in Symbolic Manipulation, ONR, 1986, (not funded).

42. "An Algebraic Directed Compiler Generator", PI. Submitted to Iowa High Tech Council, December 1984, (not funded).

4 Teaching activity

4.1 Advising activity

My last PhD students were:

1. Rudy Rudolph, PhD

2. Don Curtis, PhD

3. Mereddit Aravind, PhD

4. Bui, Cuong, PhD.

There are many students whom I advised since 1982 when I start my teaching activity at the University of Iowa, Department of Computer Science. Most of them are currently holding remarkable positions. However I only kept track of the performance of my PhD advisees.

4.1.1   PhD Advised

1. Marciano, Richard, defended successfully his PhD thesis *An Algebraic Approach to Parallel Program Development* on 1 December 1992. Richard is currently "Lead Scientist" at the San Diego Supercomputer Center in the DICE group and also Lab Director for SALT and Affiliated Professor in Social Sciences.

2. Knaack, John, defended successfully his PhD thesis *Current Trends in Language Translation* on 28 July 1994. John is currently a researcher at Cololrspan, Minneapolis.

3. Jones, James S., defended successfully his PhD thesis *Multi-layered Pipeline Parsing of Phrases from Multi-Axiom Grammars*, on 10 April 1997. Jim is currently an Associate Professor of Computer Science, Graceland College, Lamoni, Iowa.

4. Van Wyk, Eric, defended successfully his PhD thesis *Semantic Processing by Macro Processors* on 24 July 1998. Eric is currently an Assistant Professor McKnight Land-Grant Professor, Department of Computer Science and Engineering, University of Minnesota Software Engineering Center, Institute of Technology, University of Minnesota.

5. Halverson, Thomas Lee, defended successfully his PhD thesis *Language development by component-based tools* on April 1999. Tom is currently an Associate Professor of Computer Science and Dean, College of Business and Information Systems, Dakota State Universitys, Medison, South Dakota.

I was a member of many PhD thesis committees among which I remember: Ouyang Huei-Tau, (Hydrology), Fall 2001, Tan Xiangdong (Electrical Engineering, 1998), Rixin Yan (November 1996, supervisor Bob Oehmke), George Ji (December 1996, PhD supervisor Raul Curto), Razvan Gelca, (March 1966, PhD supervisor Raul Curto and Charles Frohman), Gan,Kok Siew, 1995 (forgot his supervisor).

4.1.2   MS Advised

Among the many MS advised during my tenure at the University of Iowa I remember the following:

1. James Hunsaker, Fall 2006.

2. Robert Kooima, MS, defended successfully his MS thesis on April 2001.

3. Radu Soricut, Ms, defended successfully his MS thesis in Spring 2000.

4. Dragos Stefan Muntean, Ms, defended successfully his MS thesis in Spring 2000.

5. Zuercher Douglas Michael, defended successfully his MS thesis in April 2000.

6. Thomas, George, defended successfully his MS thesis in 1999.

7. Gani,Tanveer Ahmed, defended successfully his MS thesis in April 1996.

8. Goje,Anil Dutt, defended successfully his MS thesis in May 1996.

9. 1983 – 1993 directed five MS thesis (Be Sun Liou, Margery Bushaw, James Chi-Ho Lee, John LePeau, Alex Vavra).

There are other students that I did advise but I lost track of them.

4.1.3   Honor theses advised

Among the many honor BS thesis which I advised I remember even fewer. They are:

1. Abraham Stramer, honor degree, graduated in Spring 2004.

2. William Huneke, honor degree (defended successfully 2003)

3. "A Fortran to C Translator", by Wynne Wong, April 1994,

4.2   Course development and software support

1. Adapted and taught 22C:135, Theory of Computation, to graduates and undergraduates, Fall 2004.

2. Developed and taught the new course on XML, Fall 2003.

3. Developed the new course 22C:140, Introduction to Computational Linguistics, Cross listed with Department of Linguistics, Spring Semester 2002 (30 students enrolled).

4. Developed and taught the new course 22C:298 Language Processing Technology, Fall Semester 2000.

5. Developed and taught the new course 22C-133, "Genetic Algorithms and Applications" Fall semester 1999.

6. Taught the new course 22C-132, "Parallel Programming", Fall semester 1999

7. Developed a new course on Parallel Programming for Computational Sciences, Fall semester 1996.

8. Founded the "Parallel Programming Consortium Enabling Education in Parallel Computing at the Undergraduate Level", together with Florian Potra and Judy Brown. This consortium brings together the Department of Computer Science of The University of Iowa, the Department of Computer Science of the Graceland College, the Department of Computer Science of the Luther College, and the Department of Computer Science of the Cornell College, allowing a unified approach for teaching parallel programming at undergraduate level. It is supported by an NSF $215,369.60 grant recommended for funding, used to acquire suitable equipment for this goal.

9. Initiated the seminar on reactive systems and parallel programming, Spring semester 1994.

10. Created and taught the course 22C:132, Parallel Programming, summer 1987-1994.

11. Designed and implemented a package of parallel algorithms on the ENCORE multiprocessor for instructional purposes, used for teaching 22C:132, Parallel Programming, 1987-1994.

12. Initiated the seminar of Category Theory for Computer Science as a reasoning tool for computer science foundation, Fall semester 1990.

13. Developed an interactive LR parse table construction tool, IPG, used as a compiler-teaching tool alternative to Yacc-Lex version for LR parser implementation, 1986-1990.

14. Improved the course 22C:127, Compiler Construction, 1984-1992.

15. Developed a text for 22C:32, Introduction to System Software, which offers a systematic treatment of system software as a deductive system, 538 pages, available from Iowa Memorial Union Book Store, August 1991. See Section 4.4, Educational Publications.

4.3   Overload teaching

1. 22C:398, Research Seminar: Language Processing Technology Spring 2005 (Attendees: TICS research group + George Thomas and John Lee from Computer Engineering)

2. 22C:398, Research Seminar: Domain-Oriented Ontology-Based Software Development, Fall 2004 (Attendees: TICS research group + George Thomas and John Lee from Computer Engineering)

3. 22C:398, Research Seminar: Language Processing Technology, Fall 2003 and Spring 2004 (Attendees: TICS research group plus few graduates and undergraduate students).

4. 22C:398, Research Seminar: Component-Based Software Development, Fall 2002 and Spring 2003 (Attendees: TICS research group plus class 22C:127, Spring Semester 2003).

5. 22C:398, Research Seminar: Language Processing Technology, Fall 2000 and Spring 2001 (Attendees: R. Soricut, S, Munteanu, J. Hunsaker, A. Stramer).

6. 22C:398, Research Seminar: Programming Languages, Fall 1995 and Spring 1996, seven students. This seminar was held while I was in my sabbatical.

7. 22C:398 Research Seminar: Programming Languages, Fall 1994, six students including all my PhD Students.

8. Served on two PhD defense committees, 1994-1995.

9. 22C:398 Research Seminar: Programming Languages, 1992–1993, six to eight students attending including all my PhD Students.

10. An average of 4 students per semester taking individual classes with me (research, readings, special projects), 1983 – present.

11. Served on more than ten (10) PhD defense committees, 1983 – present.

4.4 Educational publications

1. *System Software and Software Systems: Concepts and Methodology*, Volume 1: *Systems Methodology for Software*, T. Rus and D. Rus, World Scientific 1995, Second printing, used as textbook for 22C:32, Introduction to System Software.

2. *System Software and Software Systems: Concepts and Methodology*, Volume 2: *Execution Support Environment*, T. Rus and D. Rus, World Scientific 1995, used as reference book for 22C:32, Introduction to System Software and partial textbook for 22C:132, Parallel Programming.

3. *Systems Methodology for Software* by T. Rus and D. Rus, World Scientific 1993.

4. *System Software and Software Systems: Concepts and Methodology*, Vol 1: Systems Methodology for Software, Vol 2: Execution Support Environment, Vol 3: Programming Support Environment, World Scientific Publishing Co., Inc., 1992-1995.

5. *System Software and Software Systems: Concepts and Methodology*, advanced undergraduate textbook on operating system topics. Available for student instruction at Iowa Memorial Union Book Store, Iowa City, August 1991, 535 pages.

6. *Proceedings of the 22C-296 Seminar on Computer Science*, KINKO'S, December 1990.

4.5 Courses taught at The University of Iowa

1. Fall 2004: 22C:113, Introduction to System Software, and 22C:135, Theory of Computation (First offering to both graduates and undergraduates). Spring 2005: 22C:186, Compiler Construction.

2. Fall 2003: 22C:132 Parallel Programming and 22C:96/01 Introduction to XML Spring 2004: 22C:50 System Software

3. Fall 2001: 22C:132 Parallel Programming, 22C:050 Introduction to System Software; Spring 2002: 22C:140 Introduction to Computational Linguistics.

4. Fall 2000: 22C:132 Parallel Programming, 22C:298 Seminar on Language Processing Technology; Spring 2001: 22C:127 Compiler Construction.

5. Spring 1998, 1999: 22C-127, Compiler Construction

6. Fall 1997, 1998: 22C-132, Parallel Programming and 22C-133, Genetic Algorithms and Applications

7. Summer 1999: 22C:50, Introduction to System Software

8. Fall 1996: 22C:116 Advanced Operating Systems and 22C:(1)96 Parallel Programming for Computational Sciences.

9. Spring 1997: 22C:127 Compiler Construction

10. 22C-132, Parallel Programming, Fall Semester 1995.

11. 22C:296 Seminar on Algebraic Methodology and Software Technology, Spring Semester 1994-1995.

12. 22C:132, Parallel Programming, Fall Semester 1994-1995.

13. 22C:32. Introduction to System Software, Fall Semester 1994-1995.

14. 22C:291 Seminar on Reactive Systems and Concurrent Programming, Spring Semester 1993-1994.

15. 22C:296, Category Theory for Computer Science, Fall Semester, 1990, 10 students.

16. 22C:116, Introduction to Operating Systems and Concurrent Programming, summer 1984, 1985, spring 1989, fall 1991, an average of 20 students per class.

17. 22C:231, Advanced Computation Theory, Spring semester 1988, 10 students.

18. 22C:132, Parallel Programming, graduate class, summer 1987, 2 sections, 40 students, summer 1988, 1 section, 30 students, summer 1989, spring 1991, fall 1991, summer 1992, Fall 1993.

19. 22C: 127, Compiler Construction, graduate class, once per year 1983-1992, one section, an average of 15 students per class.

20. 22C:296, Seminar on Compiler Code Generation, fall 1986, 12 students.

21. 22C:296, Seminar on Semantic Directed Compiler Construction, fall 1983, 7 students.

22. 22C:32, Introduction to System Software, undergraduate class. One or two times per year 1982-1993. An average of 30 students per class.

23. 22C:21, Data Structures, undergraduate class, summer 1985, 20 students.

More information about these courses and student evaluation forms are available upon request.

4.6   Teaching elsewhere

1. Lisp System, postgraduate class, Computing Institute of the Chinese Academy, Beijing, 1979.

2. Data Structures and Operating Systems, graduate class, Babes-Bolyai University, Department of Mathematics, Cluj-Napoca, 1974.

3. Operating Systems, graduate class, University of Saarlandes, Department of Applied Mathematics and Computer Science, Saarbrücken, 1972.

4. Numerical Analysis, graduate class, Babes-Bolyai University, Department of Mathematics, 1964-1968.

More information about these courses is available upon request.

4.7 Committee memberships and editorial activity

1. Program Committee, AMAST 2004, Stirling, Scotland on July 12 – July 16, 2004.

2. Program Committee, AMAST 2002, held in St. Gilles les Bains, Reunion Island, France on September 9-13, 2002.

3. Program Committee 6th World Conference on Integrated Design and Process Technology (IDPT 2002) held in Pasadena (California), June 26 - 30, 2002.

4. Program Committee Chair, AMAST 2000 held in Iowa City, 23 –27 May 2000

5. Program Committee, The Third AMAST International Workshop on Algebraic Methods in Language Processing, held in Iowa City, 20–22 May 2000

6. Program Committee of FM'99, The World Congress on Formal Methods, Toulouse, France, September 1999.

7. Chair of AMAST-Minitrack organized during the World Congress on Formal Methods, FM'99, Toulouse, France, September 1999.

8. Chair of Steering Committee of ARTS'99, The 5-th International AMAST Workshop on Real-Time and Probabilistic Systems, May 26-28, 1999, Bamberg, Germany.

9. Program Committee of the 7-the International Conference on Algebraic Methodology And Software Technology, AMAST'98, Amazonia, Brazil, January 4–10, 1999.

10. Program Committee of the 6-th International Conference on Algebraic Methodology And Software Technology, AMAST'97, Sydney, Australia, December 12–17, 1997.

11. Chairman and Program Committee Member of the 4-th International Workshop on Real-Time System Development, 21–23 May 1997, Mallorca, Spain.

12. Program Committee of the Fifth International Conference on Algebraic Methodology And Software Technology, AMAST'96, Munich, July 1–5, 1996.

13. Organizing Committee and Program Committee of the Third International Workshop on Real-Time System Development, 6–8 March 1996, Salt Lake City, Utah.

14. Program Committee of the First AMAST Workshop on Language Processing, AMiLP'95, 5–8 December 1995, Enschede, The Netherlands.

15. Program Committee of the Second International AMAST Workshop on Real-Time System Development, held on June 13-16, 1995, Bordeaux, France.

16. Organizing Committee Chair of the Fourth International Conference on Algebraic Methodology And Software Technology, AMAST'95, Montreal, July 3-7, 1995.

17. Associate Editor of the *Journal of Computing and Information, JCI*, 1995.

18. Organized the First International AMAST Workshop on Real-Time System Development, held on November 1-3, 1993 in Iowa City, Iowa.

19. Managing Editor, AMAST Series in Computing, World Scientific Publishing Co., Inc., Suit 1B, 1060 Main Street, River Edge, NJ 07661, Starting 1992. A new international publication dedicated to algebraic methodology used as foundation for software technology.

20. Program Committee Member, Third International Conference on Algebraic Methodology and Software Technology, AMAST, Enschede, The Netherlands, June 21-25, 1993.

21. Program Committee Member of the International Conference on Computing and Information, ICCI'92, May 28-30, 1992, York University, Toronto, Canada.

22. Program Committee Chair, Second International Conference on Algebraic Methodology and Software Technology, AMAST, Iowa City, Iowa, May 22-22, 1991.

23. Program Committee Chair, First International Conference on Algebraic Methodology and Software Technology, AMAST, Iowa City, Iowa, May 22-24, 1989.

24. Member of the Organizing Committee, MFPS, New Orleans, Louisiana, March 29-April 1,1989.

25. Chair of Session 5B: Software Support, COMPSTAN'88, The Conference on Computer Standards, March 21-23, 1988, Washington, D.C.

26. Chair of Tutorials, Conference and Tutorial Board, IEEE Computer Society, 1988.

27. Chair of IEEE Standards Activity Board, Technical Committee on Computer Languages, 1987-present.

28. Member of the European Workshop on Industrial Computer Systems (EWICS), Brussels, 1980-1982.

29. Member of the Ada Europe Committee, 1980-1981.

4.8   Departmental activity

1. Member of the advising committee

2. Member of the student recruitment committee

3. Member of the library committee

4. On the Advisory Board of "Applied Mathematical and Computational Sciences", an Interdisciplinary PhD Program at the University of Iowa, 1988 –2012.

5. Member of the advising committee

6. Member of the library committee

7. Member of the student recruitment committee

8. Graduate committee, 1992-1993.

9. Hiring committee, 1991-1992.

10. Colloquium chair, 1986-1989.

11. Member, Graduate Committee, 1985.

12. Member, Undergraduate Committee, 1983-1984.

13. Organized AMAST'89 and AMAST'91 in Iowa City.

4.9   Professional membership

- American Mathematical Society, (AMS).

- Society for Industrial Application of Mathematics, (SIAM).

- Association for Computing Machinery, (ACM).

- Institute of Electrical and Electronics Engineering, (IEEE) Computer Society.

5   Experience with software development

5.1   At the University of Iowa

1. Started the implementation and distribution of a Component-Based Software Development Technology

2. Completed a new version of the TICS system, currently used for teaching Compiler Construction

3. Completed the prototype of the TICS System initiated in 1994–1995. Demonstrations are available in http://www.cs.uiowa.edu/~rus. This is a password protected directory.

4. Started a professional implementation of TICS system, T. Rus, T. Halverson, E. Van Wyk, A.D. Goje, Spring semester 1994-1995.

5. Implemented a new language analysis system, las, on the basis of structuring BNF specification rules as a language specification space, T. Rus and Tom Halverson, 1993-1995.

6. Implemented a fast pattern matching algorithm and used it to develop parallel tools for language parsing by pattern matching, T. Rus and John Knaack, 1993-1994.

7. Designed and implemented a package of parallel algorithms on the ENCORE multiprocessor for instructional purposes, T. Rus and various students attending 22C:132, 1987-1994.

8. TICS System, An Algebraic Compiler Generator, ported from Vax-11/780 to IBM RS-6000, T. Rus, J. Knaack, and K. Lee, 1992-1993.

9. TICS System, An Algebraic Compiler Generator, Prototype, implemented on Vax-11/780, T. Rus, C. Maxson, J. Knaack, J.C.H. Lee, 1988-1992.

10. Using Multimax operating system on Encore machine and Concentrix system on Alliant FX/8 for parallel programming, 1987-1994.

11. Using Lex and Yacc for parser generation, 1983-1990.

12. Developed an interactive LR parse table construction tool, IPG, used as alternative to Yacc-Lex version for LR parser implementation, T. Rus and J. LePeau, 1986-1990.

13. Designed the database for source and target language specification, in an algebraic compiler, 1987-1988, T. Rus, J. LePeau, J. Knaack.

5.2 Elsewhere

1. Developed the first version of the system Technology for Implementing Computer Software, TICS, and used it for compiler construction, Institute for Computing Technique, ITC Cluj-Napoca, 1976-1982.

2. Design of an Ada Compiler, Stirling University, 1980.

3. Development of Context Free Algebras, formal tools for algebraic treatment of programming languages, Université Laval, Quebec, 1975.

4. Design and implementation of a hospital database, Saarbrücken, 1972.

5. Elaboration of an algebraic approach for data base management, Saarbrücken, 1972.

6. Initiation of the algebraic treatment of programming languages, Saarbrücken, 1972.

7. Design and implementation of the INTERFOR system, a translator from the IBM Fortran language into the CII SIRIS Fortran language, ITC Cluj-Napoca, 1971-1972.

8. Design and Implementation of the multiprogramming system for the DACICC-200 Computer, Computing Institute of the Romania Academy, 1967-1969.

5.3 Management experience

1. **As Director of Software Laboratory, ITC:** The software laboratory is a section in the ITC, one of the two branches of the Romanian Computer industry. The task of this laboratory is to design and implement compilers for all programming languages targeted for hardware systems produced by the ITC's sister branch, the Factory of Computers. I was responsible for the technical direction and management of the laboratory's approximately 60 employees. Laboratory projects included the design and implementation of Basic, Fortran, Cobol, Algol-60, PL1, Lisp, and Ada compilers for the Factory's own products and its licensed productions of IBM:360-370 and PDP-11 type machines.

2. **As Manager of Software Products Developed in ITC:**

   (a) Elaborating documentation for the software products developed in the software laboratory.
   (b) Installation of the compilers produced by the software laboratory on the hardware systems.
   (c) Providing maintenance for the products developed in the software laboratory.
   (d) Providing user training for the software products developed in the software laboratory.

5.4 Software distributions

1. Installed the new version of TICS system at Macquarie University, Sydney, Australia, December 1997.

2. Installed an instructional package of parallel programs, Weeg Computing Center, 1987–1994.

3. Installed TICS System during Summer 1990 – Spring 1993 in the computer environments of the departments of computer science of the following universities: The University of Twente, Enschede, The Netherlands (Prof. Giuseppe Scollo), Aarhus University, Denmark (Prof. Peter Mosses), The University of Copenhagen, Denmark (Prof. Niel Jones), The University of Paris 7, France (Prof. Maurice Nivat), The University of Orsey, France (Prof. Marie-Claude Gaudel), The University of Saarland, Saarbrücken, Germany (Prof. Günter Hotz,), Technische Universität Berlin (Prof. Hartmut Ehrig), The University of Stirling, Stirling, Scotland (Prof. Charles Rattray), The University of Utah, Salt Lake City, Utah (Prof. Gary Lindstrom), Brigham Young University, Provo, Utah (Prof. Aurel Cornell).

4. Installed the Interactive Parser Generator, IPG, on the machines available for teaching compilers in the Department of Computer Science, University of Iowa, 1986-1992

5. Defined an Input/Output Management System, European Workshop for Industrial Computer Systems, EWICS, 1981.

6. Designed and implemented compilers of Basic, Fortran, PL1 languages, ITC-Bucharest, 1977-1982.

7. Designed and implemented a Lisp System, China, 1979.

8. Designed and implemented the INTERFOR System, a source-to-source program transformation package mapping Fortran IBM → Fortran CII languages, 1975.

9. Designed and implemented the system generator for SIRIS operating system, CII, Paris, 1969-1970.

10. Designed and implemented DACICC-200 Multiprogramming System, ITC Cluj, Romania, 1969.