

Paul Tarau, Ph.D.

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Education:

- Ph.D. - Computer Science 1990 - Université de Montreal
- M.Sc. - Computer Science 1986 - Université Laval (Quebec)
- B.Sc. - Mathematics 1975 - University of Bucharest

Citizenship/Residence:

Canadian, USA Resident

Research

Research interests

- Computational Mathematics, Bijective Data Type Transformations, Gödel numberings, Ranking/Unranking functions
- Exact Circuit Synthesis Algorithms
- Design and Implementation of Declarative and Object Oriented Programming Languages
- Natural Language Processing
- Logic Programming and Logic Grammars
- Java and Prolog based Agent Infrastructures
- Compilers, Run-time Systems and Automatic Memory Management
- Graph Visualisation, 3D-Animation

- *PhD thesis:* Theory and Implementation of Logic Program Transformations
- *MSc thesis:* Implementation of an expert system shell with a natural language interface (in Lisp).

Recent invited talks:

- Invited Talk at IICS'2001, Germany (Innovative Internet Computing Systems)
- Invited Talk at 2000 International Summer School in Computational Logic Acquafredda di Maratea (Basilicata, Italy) September 3-8, 2000 <http://www.cs.unimaas.nl/etalle/school2000/index.html>
- Invited Talk at AGP'99, Italy (international conference in the field of Logic Programming)
- Invited Tutorial at Logic Programming Summer School'99, Univ. of New Mexico
- Keynote Speech at INAP'96, Japan
- Invited Tutorial at ILPS'97, USA
- Invited Talk at JICLSP'98, Implementation of LP Workshop, UK
- Invited Talk at JELIA'98, Germany
- Invited conferences at MITRE Corporation (1999), Oregon Graduate Institute (1999), Simon Fraser University (1998)
- Two Invited Tutorials on Internet and E-Commerce at Tandy Corp., Forth Worth, (Summer 1999)

Research Grants

- Graph Algorithms for Text Disambiguation, Summarization and Entailment, with Dr. Rada Mihalcea, 2006-2007 Texas ARP, \$99000
- Prolog based Internet Datamining: NovuWeb Inc. Research Grant, 2000, \$7,500/1 year
- UNT Research Grant (with Dr. A. Mikler) 2000 - \$3,500/1 year
- Radiance Group Research Grant 1998 (at Louisiana Tech, US), \$7000/1 year
- NSERC RESEARCH GRANT 1998-2002 (Canada) CA\$72,000/4 years - discontinued due to move to US -
- NSERC RESEARCH GRANT 1994-1998 (Canada) CA\$50,000/4 years
- NSERC EQUIPMENT GRANT 1992-1993 (Canada)
- NSERC OPERATING GRANT 1991-1994 (Canada)
- BC Innovative Funds Proposal "Computing Science Teaching and Training Using WWW" with Dr. Veronica Dahl and Dr. Jiawei Han from SFU: 1995-1996
- CLTI Moncton: 1996-1997 - CA\$30,000 with Dr. Veronica Dahl from Simon Fraser University, CLTI + APECA with industrial partner E-COM
- Univ. Moncton FESR GRANT GRANT 1991-1994,1994-1997,1998-2000 (Canada) - discontinued due to move to US -
- KU Leuven visiting researcher grant: 1994 (Canada)
- IRISA+Univ. de Rennes visiting researcher grant: 1994
- various RD contracts with Canadian government agencies: 1987,1988,1992

Teaching experience:

Positions held:

- Tenured Associate Professor at Univ. of North Texas, from Sept 1998
- Tenure Track Associate Professor at Louisiana Tech University, from Dec 1997- to Aug 1998
- Tenured Associate Professor since 1994 at Univ. of Moncton
- Tenured Assistant Professor since 1989 at Univ. of Moncton
- tenure track teaching position at University of Moncton since 1986
- temporary teaching at Universite Laval, Universite de Montreal

Teaching philosophy

I value independent, creative thinking, and the ability to apply learnings to new situations. My teaching emphasizes *operational knowledge*: the ability to *do* things, to solve problems, by combining rigorous logic with induction and experiment. I tend to evaluate students in a way that strongly discourages recitation of passively memorized or superficially understood concepts. While making sure that weaker students acquire and improve basic skills as much as possible, I put special emphasis on letting exceptional students fly as high as they can. One of the main dangers in rapidly evolving domains, like computer science, is deprecation of knowledge. I tend to fight this by adapting my courses to cover key technological changes in our field. Finally, I think about teaching and research as activities which interoperate and stimulate each other.

Service

UNT Service

- CSE Personnel Affairs Committee - co chair in 2008-2009
- CS Undergraduate Committee
- CS Graduate Committee
- CS Library Contact
- CS Chair Search Committee
- CS Search Committee

Recent Program Committees and Grant Panels:

- 2003 NSF Panelist
- 1998-2001: serving a 3-year term on the Canadian NSERC Computer Science grant committee
- CICLOPS'09, SAC'08, ICLP'07, CICLOPS'07, SAC'06, ICLP'04, PADL'04, CICLOPS'04, INAP'04, SONA'04, PADL'03, ICLP'07
- PADL'02, PPDP'2000, CL2000, PADL'2000, JFPLC'2000, ESAW'2000
- COCL'99, MAS'99, IDL'99, DIPLCLP'99, PADL'2000, JFPLC'2000
- JICSLP'98, JFPL'98, ICLP'1997, IWLPTIA'1997
- JICSLP'1996, ICLP'1995, LOPSTR'1995, JFPL'96

Journal Refereeing

- Theory and Practice of Logic Programming,
- Journal of Logic Programming,
- Journal of LISP and Symbolic Computation,
- Journal of Computer Languages,
- TOPLAS

Workshops (co)-organized

- CICLOPS'09 (Pasadena, CA)
- IDL'99 (Paris)
- DIPLCPL'99 (Las Cruces, NM)
- ICLP'97 Leuven: Second International Workshop on Logic Programming Tools for Internet Applications,
- CP'97 Workshop on Constraint Reasoning on the Internet
- JICSLP'96 Bonn: First Workshop on Logic Programming Tools for Internet Applications
- ILPS'95 Ithaca: Implementation of Logic Programming Languages Workshop
- ICLP'94 Budapest: Blackboard Based Logic Programming Workshop

ACM, Association of Logic Programming

Publications and Creative Activities

Recent publications

- Refereed Journal papers: [1] [2, 3, 4] [5, 6] [7, 8, 9, 10]
- Refereed International Conferences and Workshops: [11, 11, 12, 13, 14, 15], [16, 17, 18, 19, 20, 21] [22, 23], [24, 25, 26, 27, 28] [29, 30, 31, 32, 33, 34, 35, 36, 37, 38] [39, 40, 41, 42, 43] [44] [45], [46, 47, 48, 49, 50, 51] [52, 53, 54, 55, 56] [57, 58, 59, 60, 61] [62, 63, 64, 65, 66, 67, 68, 69, 70] [71, 72, 73, 74, 75] [76, 77, 78, 79, 80, 81, 82, 83, 84, 85] [86, 87, 88, 89, 90, 91, 92] [93] [94, 95, 96, 97, 98, 99] [100] [101, 102, 103] [104] [105]
- Invited talks: INAP'96 Keynote Speech: [106] ILPS'97 Advanced Tutorial: [107], WWW6 LP'97 [108], JICSLP'98 Implementation of (C)LP Languages Workshop T[109] JELIA'98 Invited Talk [110] AGP'99 Invited Talk
- Other refereed publications: [59, 111, 112, 113, 114, 115, 116]
- Refereed National Conferences and Workshops: [117, 118, 119]
- Other publications: [120, 121, 122, 123, 124, 125, 126, 127] [128, 129, 130, 131, 132, 133, 134] [135, 108, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151]
- PhD Thesis: [152]
- Proceedings Edited [153, 154, 155, 156, 157, 158]

References

- [1] Paul Tarau and Veronica Dahl. High-Level Networking with Mobile Code and First Order AND-Continuations. *Theory and Practice of Logic Programming*, 1(3):359–380, May 2001. Cambridge University Press.
- [2] Paul Tarau, Koen De Bosschere, Veronica Dahl, and Stephen Rochefort. LogiMOO: an Extensible Multi-User Virtual World with Natural Language Control. *Journal of Logic Programming*, 38(3):331–353, March 1999.
- [3] Paul Tarau. Multi-Engine Horn Clause Prolog. *Electronic Notes in Theoretical Computer Science*, 30(3), 1999.
- [4] V. Dahl, P. Tarau, S. Rochefort, and M. Scurtescu. A Spanish Interface to LogiMoo- towards multi-lingual virtual worlds. *Informatica*, (2), June 1999.
- [5] V. Dahl, P. Tarau, P. Accuosto, S. Rochefort, and M. Scurtescu. Assumption Grammars for Knowledge Based Systems. *Informatica*, (4), 1998. Special Issue on NLP and Agent Communication.
- [6] Veronica Dahl and Paul Tarau. From Assumptions to Meaning. *Canadian Artificial Intelligence*, (42), April 1998.
- [7] P. Tarau, K. De Bosschere, and Bart Demoen. On Delphi Lemmas And other Memoing Techniques For Deterministic Logic Programs. *Journal of Logic Programming*, 30(2):145–163, February 1997.
- [8] Paul Tarau, Koen De Bosschere, and Bart Demoen. Partial Translation: Towards a Portable and Efficient Prolog Implementation Technology. *Journal of Logic Programming*, 29(1–3):65–83, November 1996.

- [9] K. De Bosschere and P. Tarau. Blackboard-based Extensions in Prolog. *Software — Practice and Experience*, 26(1):49–69, January 1996.
- [10] Paul Tarau. Une machine abstraite optimisée à passage de continuations: l’expérience BinProlog. *Technique et Science Informatique*, 14(6):713–731, 1995.
- [11] Paul Tarau. An Embedded Declarative Data Transformation Language. In *Proceedings of 11th International ACM SIGPLAN Symposium PPDP 2009*, pages 171–182, Coimbra, Portugal, September 2009. ACM.
- [12] Paul Tarau. A Groupoid of Isomorphic Data Transformations. In J. Carette, L. Dixon, C. S. Coen, and S. M. Watt, editors, *Intelligent Computer Mathematics, 16th Symposium, Calculemus 2009, 8th International Conference MKM 2009*, pages 170–185, Grand Bend, Canada, July 2009. Springer, LNAI 5625.
- [13] Paul Tarau and Arun Majumdar. Interoperating Logic Engines. In *Practical Aspects of Declarative Languages, 11th International Symposium, PADL 2009*, pages 137–151, Savannah, Georgia, January 2009. Springer, LNCS 5418.
- [14] Paul Tarau. Isomorphisms, Hylomorphisms and Hereditarily Finite Data Types in Haskell. In *Proceedings of ACM SAC’09*, pages 1898–1903, Honolulu, Hawaii, March 2009. ACM.
- [15] Paul Tarau and Brenda Luderman. Computing Ranking and Unranking Functions for BDDs. In *Proceedings of 16th Symposium on the Integration of Symbolic Computation and Mechanised Reasoning, Calculemus 2009 - Emerging trends*, pages 31–42, Grand Bend, Canada, July 2009. <http://www.calculemus.net/meetings/ontario09/trends-09.pdf>.
- [16] Paul Tarau. Logic Engines as Interactors. In Maria Garcia de la Banda and Enrico Pontelli, editors, *Logic Programming, 24-th International Conference, ICLP*, pages 703–707, Udine, Italy, December 2008. Springer, LNCS.
- [17] Paul Tarau and Brenda Luderman. Exact combinational logic synthesis and non-standard circuit design. In *CF ’08: Proceedings of the 2008 conference on Computing frontiers*, pages 179–188, New York, NY, USA, 2008. ACM.
- [18] Paul Tarau and Brenda Luderman. Revisiting Exact Combinational Circuit Synthesis. In *Proceedings of the 2008 ACM symposium on Applied computing*, pages 1758–1759, Fortaleza, Brazil, March 2008.
- [19] Paul Tarau. Interactors: Logic Engine Interoperation with Pure Prolog Semantics. In Manuel Carro and Bart Demoen, editors, *Proceedings of CICLOPS 2008, 8th International Colloquium on Implementation of Constraint and LOGic Programming Systems*, pages 17–32, December 2008.
- [20] Paul Tarau. Declarative Combinatorics in Prolog: ShapeShifting Data Objects with Isomorphisms and Hylomorphisms. In Manuel Carro and Bart Demoen, editors, *Proceedings of CICLOPS 2008, 8th International Colloquium on Implementation of Constraint and LOGic Programming Systems*, pages 107–123, December 2008.
- [21] Paul Tarau. Pairing Functions, Boolean Evaluation and Binary Decision Diagrams. In Manuel Carro and Bart Demoen, editors, *Proceedings of CICLOPS 2008, 8th International Colloquium on Implementation of Constraint and LOGic Programming Systems*, pages 139–153, December 2008.
- [22] Paul Tarau and Brenda Luderman. A Logic Programming Framework for Combinational Circuit Synthesis. In *23rd International Conference on Logic Programming (ICLP), LNCS 4670*, pages 180–194, Porto, Portugal, September 2007. Springer.

- [23] Arun Majumdar, Mary Keeler, Paul Tarau, and John Sowa. Semantic Distances As Knowledge Capture Constraints. In *First Workshop on Knowledge Capture and Constraint Programming (KCCP-2007)*, Whistler, BC, September 2007.
- [24] Paul Tarau, Rada Mihalcea, and Elizabeth Figa. Semantic document engineering with WordNet and PageRank. In *Proceedings of the ACM Conference on Applied Computing (ACM-SAC 2005)*, pages 782–786, Santa Fe, NM, March 2005.
- [25] Rada Mihalcea and Paul Tarau. An Algorithm for Language Independent Single and Multiple Document Summarization. In *Proceedings of the International Joint Conference on Natural Language Processing (IJCNLP)*, Korea, October 2005.
- [26] Andy Borman, Rada Mihalcea, and Paul Tarau. PicNet: Pictorial Representations for Illustrated Semantic Networks. In *Proceedings of the AAAI Spring Symposium on Knowledge Collection from Volunteer Contributors*, Stanford, CA, March 2005.
- [27] Rada Mihalcea and Paul Tarau. Multi-Document Summarization with Iterative Graph-based Algorithms. In *Proceedings of the First International Conference on Intelligent Analysis Methods and Tools (IA 2005)*, McLean, VA, May 2005.
- [28] David Hurt and Paul Tarau. An empirical evaluation of communication effectiveness in autonomous reactive multiagent systems. In *Proceedings of the ACM Conference on Applied Computing (ACM-SAC 2005)*, pages 74–78, Santa Fe, NM, March 2005.
- [29] Paul Tarau. Orthogonal Language Constructs for Agent Oriented Logic Programming. In Manuel Carro and Jose F. Morales, editors, *Proceedings of CICLOPS 2004, Fourth Colloquium on Implementation of Constraint and Logic Programming Systems*, Saint-Malo, France, September 2004.
- [30] Paul Tarau, Rada Mihalcea, and Elizabeth Figa. A Logic Programming Framework for Semantic Interpretation with WordNet and PageRank. In Manuel Carro and Jose F. Morales, editors, *Proceedings of CICLOPS 2004, Fourth Colloquium on Implementation of Constraint and Logic Programming Systems*, Saint-Malo, France, September 2004.
- [31] Paul Tarau. Agent Oriented Logic Programming Constructs in Jinni 2004. In Bart Demoen and Vladimir Lifschitz, editors, *Logic Programming, 20-th International Conference, ICLP 2004*, pages 477–478, Saint-Malo, France, September 2004. Springer, LNCS 3132.
- [32] Veronica Dahl and Paul Tarau. Assumptive Logic Programming. In *Proceedings of ASAI 2004 VI Argentine Symposium on Artificial Intelligence*, Cordoba, Argentina, September 2004.
- [33] Paul Tarau and Elizabeth Figa. Knowledge Based Conversational Agents and Virtual Storytelling. In *Proceedings of the 2004 ACM Symposium on Applied Computing*, Nicosia, Cyprus, March 2004. ACM Press.
- [34] Rada Mihalcea, Paul Tarau, and Elizabeth Figa. PageRank on Semantic Networks, with application to Word Sense Disambiguation. In *Proceedings of The 20th International Conference on Computational Linguistics (COLING 2004)*, Geneva, Switzerland, August 2004.
- [35] Rada Mihalcea and Paul Tarau. TextRank: Bringing Order into Texts. In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP 2004)*, Barcelona, Spain, July 2004.
- [36] Elizabeth Figa and Paul Tarau. Knowledge Assimilation and Web Deployment Techniques for Conversational Agents. In Zsofia Ruttkay C. Pelachaud and Kris Thorisson, editors, *Proceedings of the AAMAS 2004 Workshop On Embodied Conversational Agents: Balanced Perception and Action*, pages 108–114, New York, USA, July 2004.

- [37] Elizabeth Figa and Paul Tarau. Conversational Agents as Web Services. In H.R. Arabnia and S. Chatterjee, editors, *Proceedings of The International Symposium On Web Services and Applications ISWS'04*, pages 773–782, Las Vegas, Nevada, USA, June 2004.
- [38] E. Figa, P. Tarau, and J. Ephraim. Enhancing the virtual storytelling experience with metadata driven voice enabled conversational agents. *Proceedings of the American Society for Information Science and Technology*, 41(1), 2004.
- [39] Elizabeth Figa and Paul Tarau. Lexical Inference Mechanisms for Text Understanding and Classification. In Ross J. Todd, editor, *Proceedings of the 66th Annual Meeting of American Society for Information Science and Technology*, pages 165–173, Long Beach, California, October 2003.
- [40] Paul Tarau and Azzedine Bouckerche. Agents and Ambient Intelligence in the Jinni Infrastructure. In A. Kameas P. Spirakis and S. Nikolettseas, editors, *International Workshop on Ambient Intelligence Computing*, pages 83–99, Santorini, Greece, June 2003. CTI Press. ISBN 940-406-462-2.
- [41] Qinan Zhou and Paul Tarau. Garbage Collection Algorithms for Java-Based Prolog Engines. In V. Dahl and P. Wadler, editors, *Practical Aspects of Declarative Languages, 5th International Symposium, PADL 2003*, pages 304–320, New Orleans, USA, January 2003. Springer, LNCS 2562.
- [42] Elizabeth Figa and Paul Tarau. The VISTA Project: An Agent Architecture for Virtual Interactive Storytelling. In N. Braun and U. Spierling, editors, *TIDSE'2003*, Darmstadt, Germany, March 2003.
- [43] Elizabeth Figa and Paul Tarau. Story Traces and Projections: Exploring the Patterns of Storytelling. In N. Braun and U. Spierling, editors, *TIDSE'2003*, Darmstadt, Germany, March 2003.
- [44] Elizabeth Figa and Paul Tarau. The VISTA Project: An Agent Architecture for Virtual Interactive Storytelling. In *CSCW 2002 Workshop on Storytelling and Collaborative Activities*, New Orleans, November 2002.
- [45] Satyam Tyagi, Paul Tarau, and Armin Mikler. Multicast Protocols for Jinni Agents. In T. Boehme and H. Unger, editors, *Innovative Internet Computing Systems, IICS 2001*, pages 1–18, Ilmenau, Germany, June 2001. Springer, LNAI 2060.
- [46] Paul Tarau. Fluents: A Refactoring of Prolog for Uniform Reflection and Interoperation with External Objects. In John Lloyd, editor, *Computational Logic-CL 2000: First International Conference*, London, UK, July 2000. LNCS 1861, Springer-Verlag.
- [47] A. Garcia and D. Gollapally and P. Tarau and G. Simari. Deliberative stock market agents using Jinni and defeasible logic programming. In *Proc. of the ECAI Workshop on Engineering Societies in the Agents' World*, Berlin, Germany, August 2000. Springer.
- [48] Anima Gupta and Paul Tarau. Assumption Grammars for Generating Dynamic VRML Pages. In Ins de Castro Dutra, editor, *Proceedings of CL2000 Workshop on Parallelism and Implementation Technology for (Constraint) Logic Programming*, London, UK, June 2000.
- [49] Satyam Tyagi and Paul Tarau. Multicast Protocols for Jinni Agents. In Ins de Castro Dutra, editor, *Proceedings of CL2000 Workshop on Parallelism and Implementation Technology for (Constraint) Logic Programming*, London, UK, June 2000.
- [50] Anima Gupta and Paul Tarau. Logic Programming Techniques for Dynamic VRML Web Content Generation. In I.V. Ramakrishnan and Gopal Gupta, editors, *Proceedings of PADL'2001*, Las Vegas, March 2001. Springer-Verlag.
- [51] Satyam Tyagi and Paul Tarau. A Most Specific Method Finding Algorithm for Reflection Based Dynamic Prolog-to-Java Interfaces. In I.V. Ramakrishnan and Gopal Gupta, editors, *Proceedings of PADL'2001*, Las Vegas, March 2001. Springer-Verlag.

- [52] Paul Tarau. A Logic Programming Based Software Architecture for Reactive Intelligent Mobile Agents. In P. Van Roy and P. Tarau, editors, *Proceedings of DIPLCL'99*, Las Cruces, NM, November 1999.
- [53] Paul Tarau. Multi-Engine Horn Clause Prolog. In Gopal Gupta and Enrico Pontelli, editors, *Proceedings of Workshop on Parallelism and Implementation Technology for (Constraint) Logic Programming Languages*, Las Cruces, NM, November 1999.
- [54] Paul Tarau. Intelligent Mobile Agent Programming at the Intersection of Java and Prolog. In *Proceedings of The Fourth International Conference on The Practical Application of Intelligent Agents and Multi-Agents*, pages 109–123, London, U.K., 1999.
- [55] Stephen Rochefort, Veronica Dahl, and Paul Tarau. A Framework for Virtual Learning Environments. In *Proceedings of EMEDIA'99 World Conference on Educational Multimedia, Hypermedia and Telecommunications*, Seattle, Washington, june 1999.
- [56] A.R. Mikler, H. Unger, P. Tarau, A. S. Hopper, and F. Chen. A Mobile Agent-Based File System for Distributed Networks. In *High Performance Computing'99, Special Session on Adaptive and Intelligent Computing Systems*, 1999.
- [57] Stephen Rochefort, Veronica Dahl, and Paul Tarau. An Agent Communication Protocol for the Feature Interaction Problem. In *Proceedings of the 11th International Conference on Applications of Prolog*, Tokyo, Japan, 1998.
- [58] Stephen Rochefort, Veronica Dahl, and Paul Tarau. A Virtual Environment for Collaborative Learning. In *World Multiconference on Systemics, Cybernetics, and Informatics*, Orlando, Florida, july 1998.
- [59] Paul Tarau. Inference and Computation Mobility with Jinni. In K.R. Apt, V.W. Marek, and M. Truszczyński, editors, *The Logic Programming Paradigm: a 25 Year Perspective*, pages 33–48. Springer, 1999. ISBN 3-540-65463-1.
- [60] Paul Tarau. Towards Logic Programming Based Coordination in Virtual Worlds. In *Proceedings of HICSS'98, Software Technology: Coordination Languages, Models, Systems*, Big Island of Hawaii, January 1998.
- [61] Paul Tarau and Veronica Dahl. Mobile Threads through First Order Continuations. In *Proceedings of APPAI-GULP-PRODE'98*, Coruna, Spain, July 1998.
- [62] Veronica Dahl, Paul Tarau, Pablo Accuosto, Stephen Rochefort, and Marius Scortescu. Assumption grammars for knowledge based systems. In *Natural Language Databases*, june 1997.
- [63] Osmar Zaiane, Andrew Fall, Stephen Rochefort, Veronica Dahl, and Paul Tarau. Concept-Based Retrieval using Controlled Natural Language. In *Proceedings of NLDB'97*, pages 11–26, Vancouver, 1997.
- [64] Veronica Dahl, Paul Tarau, and Renwei Li. Assumption Grammars for Processing Natural Language. In Lee Naish, editor, *Proceedings of the Fourteenth International Conference on Logic Programming*, pages 256–270, MIT press, 1997.
- [65] Paul Tarau, Veronica Dahl, and Koen De Bosschere. A Logic Programming Infrastructure for Remote Execution, Mobile Code and Agents. In *Proceedings of WETICE'97*, pages 106–112, IEEE Computer Society Press, June 1997.
- [66] Paul Tarau, Veronica Dahl, Stephen Rochefort, and Koen De Bosschere. LogiMOO: a Multi-User Virtual World with Agents and Natural Language Programming. In S. Pemberton, editor, *Proceedings of CHI'97*, pages 323–324, March 1997.

- [67] Stephen Rochefort, Veronica Dahl, and Paul Tarau. Controlling Virtual Worlds through Extensible Natural Language. In *AAAI Symposium on NLP for the WWW*, Stanford University, CA, 1997.
- [68] Yan-Nuong Huang and Paul Tarau. Efficient Point Data Clustering by Database Operations. In *Proceedings of the 8th International Database Workshop*, Hong Kong, July 1997.
- [69] Osmar Zaiane, Andrew Fall, Rochefort Stephen, Dahl Veronica, and Paul Tarau. On-line Resource Discovery Using Natural Language. In *Proceedings of RIAO'97*, pages 336–355, McGill University, Montreal, June 1997.
- [70] Paul Tarau and Veronica Dahl. A Coordination Logic for Agent Programming in Virtual Worlds. In Wolfram Conen and Gustaf Neumann, editors, *Proceedings of Asian'96 Post-Conference Workshop on Coordination Technology for Collaborative Applications*, Singapore, December 1996.
- [71] Paul Tarau, Veronica Dahl, and Andrew Fall. Backtrackable State with Linear Affine Implication and Assumption Grammars. In Joxan Jaffar and Roland H.C. Yap, editors, *Concurrency and Parallelism, Programming, Networking, and Security*, Lecture Notes in Computer Science 1179, pages 53–64, Singapore, December 1996. Springer.
- [72] Koen De Bosschere, Daniel Perron, and Paul Tarau. LogiMOO: Prolog Technology for Virtual Worlds. In *Proceedings of PAP'96*, pages 51–64, London, April 1996.
- [73] Bart Demoen, Geert Engels, and Paul Tarau. Segment Preserving Copying Garbage Collection for WAM based Prolog. In *Proceedings of the 1996 ACM Symposium on Applied Computing*, pages 380–386, Philadelphia, February 1996. ACM Press.
- [74] Veronica Dahl, Andrew Fall, Stephen Rochefort, and Paul Tarau. A Hypothetical Reasoning Framework for NL Processing. In *Proc. 8th IEEE International Conference on Tools with Artificial Intelligence*, Toulouse, France, November 1996.
- [75] Paul Tarau and Koen De Bosschere. Virtual World Brokerage with BinProlog and Netscape. In Tarau et al. [156].
- [76] Yves Bekkers and Paul Tarau. Monadic Constructs for Logic Programming. In John Lloyd, editor, *Proceedings of ILPS'95*, pages 51–65, Portland, Oregon, December 1995. MIT Press.
- [77] Paul Tarau, Bart Demoen, and Koen De Bosschere. The Power of Partial Translation: an Experiment with the C-ification of Binary Prolog. In K.M. George, J.H. Carrol, E. Deaton, D. Oppenheim, and J. Hightower, editors, *Proceedings of the 1995 ACM Symposium on Applied Computing*, pages 152–176, Nashville, February 1995. ACM Press.
- [78] Yves Bekkers and Paul Tarau. Logic Programming with Monads and Comprehensions. In *Proceedings of JFPL'95*, Dijon, May 1995.
- [79] V. Dahl, P. Tarau, and J. Andrews. Extending Datalog Grammars. In *Proc. of NLDB'95, Paris*, May 1995.
- [80] V. Dahl, P. Tarau, L. Moreno, and M. Palomar. Treating Coordination with Datalog Grammars. In *Proceedings of the Joint COMPULOGNET/ELNET/EAGLES Workshop on Computational Logic For Natural Language Processing*, Edinburgh, April 1995.
- [81] Paul Tarau and Bart Demoen. Higher-Order Programming in an OR-intensive Style. In Manuel Hermenegildo and Pedro Lopez, editors, *Proceedings of the 1995 COMPULOG-NET Workshop and Area Meeting on Parallelism and Implementation Technology*, 1995.
- [82] Andrew Fall, Veronica Dahl, and Paul Tarau. Resolving Co-specification in Contexts. In *Proc. of IJCAI'95 Context in Natural Language Workshop*, Montreal, August 1995.

- [83] Bart Demoen, Geert Engels, and Paul Tarau. Rejuvenating Future Garbage in WAM. In Koen De Bosschere, editor, *Proceedings of BENELOG'1995*, September 1995.
- [84] J. Andrews, V. Dahl, and P. Tarau. Continuation Logic Programming: Theory and Practice. In *ILPS'95 Workshop on Operational and Denotational Semantics of Logic Programs*, Portland, Oregon, November 1995.
- [85] P. Tarau, V. Dahl, and A. Fall. Backtrackable State with Linear Assumptions, Continuations and Hidden Accumulator Grammars. In *ILPS'95 Workshop on Visions for the Future of Logic Programming*, Portland, Oregon, November 1995.
- [86] Paul Tarau and Ulrich Neumerkel. A Novel Term Compression Scheme and Data Representation in the BinWAM. In M. Hermenegildo and J. Penjam, editors, *Proceedings of Programming Language Implementation and Logic Programming*, number 844 in Lecture Notes in Computer Science, pages 73–87. Springer, September 1994.
- [87] V. Dahl, P. Tarau, and Y. N. Huang. Datalog Grammars. In *Proc. 1994 Joint Conference on Declarative Programming*, pages 268–282, Peniscola, Spain, September 1994.
- [88] P. Tarau, B. Demoen, and K. De Bosschere. The Power of Partial Translation: an Experiment with the C-ification of Binary Prolog. In M. García de la Banda, J. and Hermenegildo M., editors, *Proceedings of the First COMPULOG-NOE Area Meeting on Parallelism and Implementation Technology*, pages 3–17, Madrid/Spain, September 1994.
- [89] Paul Tarau and Veronica Dahl. Logic Programming and Logic Grammars with First-order Continuations. In *Proceedings of LOPSTR'94, LNCS, Springer, Pisa, June 1994*.
- [90] Paul Tarau. Low level Issues in Implementing a High-Performance Continuation Passing Binary Prolog Engine. In M.-M. Corsini, editor, *Proceedings of JFPL'94*, June 1994.
- [91] Paul Tarau and Bart Demoen. Language Embedding by Dual Compilation and State Mirroring. In M. Fromherz, A. Kusalik, and O. Nytro, editors, *Proceedings of 6-th Workshop on Logic Programming Environments, Santa Margherita Ligure, 1994*, pages 15–20, June 1994. also available as TR N-7034 Norges Tek. Hogscole, TRONDHEIM.
- [92] K. De Bosschere and P. Tarau. High Performance Continuation Passing Style Prolog-to-C Mapping. In E. Deaton, D. Oppenheim, J. Urban, and H. Berghel, editors, *Proceedings of the 1994 ACM Symposium on Applied Computing*, pages 383–387, Phoenix/AZ, March 1994. ACM Press.
- [93] P. Tarau and K. De Bosschere. Blackboard Based Logic Programming in BinProlog. In L. Goldfarb, editor, *Proceedings of the fifth University of New Brunswick Artificial Intelligence Symposium*, pages 137–147, Fredericton, N.B., August 1993.
- [94] P. Tarau and K. De Bosschere. Memoing with Abstract Answers and Delphi Lemmas. In Yves Deville, editor, *Logic Program Synthesis and Transformation*, Springer-Verlag, pages 196–209, Louvain-la-Neuve, July 1993.
- [95] K. De Bosschere and P. Tarau. Blackboard-based Extensions for Parallel Programming in BinProlog. In *Proceedings of the 1993 ILPS Conference*, page 664, Vancouver, Canada, 1993.
- [96] K. De Bosschere and P. Tarau. Blackboard Communication in Logic Programming. In *Proceedings of the PARCO'93 Conference*, pages 257–264, Grenoble, France, September 1993.
- [97] K. De Bosschere and P. Tarau. Some Issues in the Implementation of a Unix-based Blackboard. In De Bosschere et al. [158], pages 91–104.

- [98] P. Tarau and K. De Bosschere. Non-Associative Blackboard Programming. In De Bosschere et al. [158], pages 77–89.
- [99] Paul Tarau. Language Issues and Programming Techniques in BinProlog. In Domenico Sacca, editor, *Proceeding of the GULP'93 Conference*, Gizzeria Lido, Italy, June 1993.
- [100] Paul Tarau. Ecological Memory Management in a Continuation Passing Prolog Engine. In Y. Bekkers and J. Cohen, editors, *Memory Management International Workshop IWMM 92 Proceedings*, number 637 in Lecture Notes in Computer Science, pages 344–356. Springer, September 1992.
- [101] Paul Tarau. A Simplified Abstract Machine for the Execution of Binary Metaprograms. In *Proceedings of the Logic Programming Conference'91*, pages 119–128. ICOT, Tokyo, 7 1991.
- [102] Paul Tarau. Program Transformations and WAM-support for the Compilation of Definite Metaprograms. In Andrei Voronkov, editor, *Logic Programming, RCLP Proceedings*, number 592 in Lecture Notes in Artificial Intelligence, pages 462–473, Berlin, Heidelberg, 1992. Springer-Verlag.
- [103] Paul Tarau. Nonstandard Answers of Elementary Logic Programs. In J.M. Jacquet, editor, *Proceedings of the ICLP'91 Workshop on Constructing Logic Programs*. Paris, 1991.
- [104] Paul Tarau and Michel Boyer. Elementary Logic Programs. In P. Deransart and J. Maluszyński, editors, *Proceedings of Programming Language Implementation and Logic Programming*, number 456 in Lecture Notes in Computer Science, pages 159–173. Springer, August 1990.
- [105] Paul Tarau and Michel Boyer. Prolog Meta-Programming with Soft Databases. In Harvey Abramson and M.H. Rogers, editors, *Meta-Programming in Logic Programming*, pages 365–382. MIT Press, 1989.
- [106] Paul Tarau. Logic Programming and Virtual Worlds. In *Proceedings of INAP96*, Tokyo, November 1996. keynote address.
- [107] Paul Tarau. Logic Programming Tools for Advanced Internet Programming. In Jan Maluszynski, editor, *Logic Programming, Proceedings of the 1997 International Symposium*, pages 33–34, MIT press, 1997.
- [108] Paul Tarau, Veronica Dahl, and Koen De Bosschere. Remote Execution, Mobile Code and Agents in BinProlog. In *Electronic Proceedings of WWW6 Logic Programming Workshop*, <http://www.cs.vu.nl/eliens/WWW6/papers.html>, Santa Clara, California, March 1997.
- [109] Paul Tarau. Jinni: a Lightweight Java-based Logic Engine for Internet Programming. In Kostis Sagonas, editor, *Proceedings of JICSLP'98 Implementation of LP languages Workshop*, Manchester, U.K., June 1998. invited talk.
- [110] Paul Tarau. Towards Inference and Computation Mobility: The Jinni Experiment. In J. Dix and U. Furbach, editors, *Proceedings of JELIA '98, LNAI 1489*, pages 385–390, Dagstuhl, Germany, October 1998. Springer. invited talk.
- [111] Paul Tarau and Veronica Dahl. A Logic Programming Infrastructure for Internet Programming. In M. J. Wooldridge and M. Veloso, editors, *Artificial Intelligence Today – Recent Trends and Developments*, pages 431–456. Springer, LNAI 1600, 1999. ISBN 3-540-66428-9.
- [112] Paul Tarau, Veronica Dahl, and Koen De Bosschere. Logic Programming Based Coordination in Virtual Worlds. In Wolfram Conen and Gustaf Neumann, editors, *Coordination Technology for Collaborative Applications - Organizations, Processes, and Agents*. Springer, LNCS 1364, March 1998. ISBN 3-540-64170-X.
- [113] P. Tarau, V. Dahl, and A. Fall. Backtrackable State with Linear Assumptions, Continuations and Hidden Accumulator Grammars. In John Lloyd, editor, *Proceedings of ILPS'95*, page 642, Portland, Oregon, November 1995. poster abstract.

- [114] P Tarau. An Efficient Specialization of the WAM for Continuation Passing Binary programs. In *Proceedings of the 1993 ILPS Conference*, Vancouver, Canada, 1993. MIT Press. poster.
- [115] Paul Tarau and M. Boyer. Nonstandard Answers of Elementary Logic Programs. In J.M. Jacquet, editor, *Constructing Logic Programs*, pages 279–300. J.Wiley, 1993.
- [116] Paul Tarau. BinProlog: a Continuation Passing Style Prolog Engine. In M. Bruynooghe and M. Wirsing, editors, *Proceedings of Programming Language Implementation and Logic Programming*, number 631 in Lecture Notes in Computer Science, pages 479–480. Springer, August 1992. poster.
- [117] Paul Tarau. Conditional and Abstract Solutions of Elementary Logic Programs. In *Proceedings of The Third UNB Artificial Intelligence Workshop*. Fredericton, N.B, August 1990.
- [118] Paul Tarau. Adding Theories to Prolog. In J.A. Bates and D. Kemp, editors, *Proceedings of CIPS Congress '87*, pages 293–298, 1987.
- [119] B. Moulin and Paul Tarau. Un environnement de conception de systemes experts pour des applications grand-public. In D. Kemp J.A. Bates, editor, *Proceedings of CIPS Congress '87*, pages 305–316, 1987.
- [120] Paul Tarau. Declarative Combinatorics: Isomorphisms, Hylomorphisms and Hereditarily Finite Data Types in Haskell, January 2009. <http://arXiv.org/abs/0808.2953>, unpublished draft, 104 pages.
- [121] Paul Tarau. Logic Engines as Interactors, 2008. <http://arXiv.org/abs/0808.0556>.
- [122] Paul Tarau. Declarative Combinatorics: Boolean Functions, Circuit Synthesis and BDDs in Haskell, 2008. <http://arXiv.org/abs/0808.0760>.
- [123] Paul Tarau. A Functional Hitchhiker’s Guide to Hereditarily Finite Sets, Ackermann Encodings and Pairing Functions, 2008. <http://arXiv.org/abs/0808.0754>.
- [124] Paul Tarau. Ranking Catamorphisms and Unranking Anamorphisms on Hereditarily Finite Datatypes, 2008. <http://arXiv.org/abs/0808.0753>.
- [125] Paul Tarau. Pairing Functions, Boolean Evaluation and Binary Decision Diagrams, 2008. <http://arXiv.org/abs/0808.0555>.
- [126] Paul Tarau. Ranking and Unranking of Hereditarily Finite Functions and Permutations, 2008. <http://arXiv.org/abs/0808.0554>.
- [127] Paul Tarau. Executable Set Theory and Arithmetic Encodings in Prolog, 2008. <http://arXiv.org/abs/0808.0540>.
- [128] Elizabeth Figa and Paul Tarau. The vista architecture: experiencing stories through virtual storytelling agents. *SIGGROUP Bull.*, 23(2):27–28, 2002.
- [129] Paul Tarau. The Jinni Prolog Compiler: a fast and flexible Prolog-in-Java, 2008. <http://www.binnetcorp.com/download/jinnidemo/JinniUserGuide.html>.
- [130] Paul Tarau. Object Oriented Logic Programming as an Agent Building Infrastructure. In Joao Bosco Manguiera Sobral, editor, *First International Workshop on Distributed Computing with Agent Technologies*, Fort Worth, October 2002. URL: http://www.inf.ufsc.br/simbosco/workshop_program.htm.
- [131] Paul Tarau. BinProlog 11.x Professional Edition: User Guide. Technical report, BinNet Corp., 2006.
- [132] Paul Tarau. BinProlog 11.x Professional Edition: Internet Programming Guide. Technical report, BinNet Corp., 2006.

- [133] Paul Tarau. BinProlog 11.x Professional Edition: Advanced BinProlog Programming and Extensions Guide. Technical report, BinNet Corp., 2006.
- [134] Paul Tarau. BinProlog 11.x Professional Edition: BinProlog Interfaces Guide. Technical report, BinNet Corp., 2006.
- [135] Andrea Schiel, Veronica Dahl, and Paul Tarau. Generating Internet Based VRML Animations through Natural Language Controlled Partial Order Planners. Technical report, Simon Fraser University, 1998.
- [136] Paul Tarau, Veronica Dahl, and Koen De Bosschere. Logic Programming Tools for Remote Execution, Mobile Code and Agents. In *Proceedings of ICLP'97 Workshop on Logic Programming and Multi Agent Systems*, Leuven, Belgium, July 1997.
- [137] Veronica Dahl, Paul Tarau, Stephen Rochefort, and Marius Scortescu. A Spanish Interface to LogiMoo-towards multilingual virtual worlds. In *International Workshop on Spanish Natural Language Processing and Spanish Language Technologies*, New Mexico, July 1997. invited talk.
- [138] Paul Tarau. BinProlog 5.75 User Guide. Technical Report 97-1, Département d'Informatique, Université de Moncton, April 1997.
- [139] Paul Tarau. BinProlog 5.25 User Guide. Technical Report 96-1, Département d'Informatique, Université de Moncton, April 1996.
- [140] Bart Demoen, Geert Engels, and Paul Tarau. Issues in (copying) garbage collection for (Bin)WAM. Technical Report CW-202, KU Leuven, 1994.
- [141] Paul Tarau and Bart Demoen. Higher-Order Programming in an OR-intensive Style. Technical Report CW-192, KU Leuven, 1994.
- [142] Paul Tarau. BinProlog 4.00 User Guide. Technical Report 95-1, Département d'Informatique, Université de Moncton, February 1995. Available by ftp from *clement.info.umoncton.ca*.
- [143] Paul Tarau. BinProlog 2.20 User Guide. Technical Report 94-1, Dept. d'Informatique, Université de Moncton, February 1994. <ftp://clement.info.umoncton.ca/BinProlog>.
- [144] Paul Tarau, Veronica Dahl, and Andrew Fall. Backtrackable State with Linear Assumptions, Continuations and Hidden Accumulator Grammars. Technical Report 95-2, Département d'Informatique, Université de Moncton, April 1995. Available by ftp from *clement.info.umoncton.ca*.
- [145] Paul Tarau and Ulrich Neumerkel. Compact Representation of Terms and Instructions in the BinWAM. Technical Report 93-3, Dept. d'Informatique, Université de Moncton, November 1993. available by ftp from *clement.info.umoncton.ca*.
- [146] Paul Tarau. BinProlog 1.71 User Guide. Technical Report 93-1, Dept. d'Informatique, Université de Moncton, February 1993. <ftp://clement.info.umoncton.ca/BinProlog>.
- [147] K. De Bosschere and P. Tarau. Continuation Passing Style Prolog-to-C Mapping at Native WAM-speed. ELIS Technical Report DG 93-15, Vakgroep Elektronica en Informatiesystemen, Universiteit Gent, November 1993.
- [148] Paul Tarau. Ecological Memory Management in a Continuation Passing Prolog engine. Technical Report 92-1, Dept. d'Informatique, Université de Moncton, February 1992.
- [149] Paul Tarau. WAM-optimizations in BinProlog: Towards a Realistic Continuation Passing Prolog Engine. Technical Report 92-3, Dept. d'Informatique, Université de Moncton, July 1992. available by ftp from *clement.info.umoncton.ca*.

- [150] Paul Tarau. A family of logic program transformations and their applications. In *APICS 1990 Computer Science Conference*. Universite de Moncton, August 1990.
- [151] J. DeFinney, C. Moghrabi, and P. Tarau. A Parser and Text Generation System for Argumentative Discourse. In D. Kemp J.A. Bates, editor, *proceedings of ICCAI, Calgary 1987*, pages 305–316, 1987.
- [152] Paul Tarau. *Transformation de programmes logiques. Bases sémantiques et applications*. Phd thesis, Université de Montréal, november 1990.
- [153] K. Sagonas and P. Tarau, editors. *Proceedings of IDL'99*, Paris, France, September 1999.
- [154] P. Van Roy and P. Tarau, editors. *Proceedings of DIPLCL'99*, Las Cruces, NM, November 1999.
- [155] Paul Tarau, Koen De Bosschere, and Manuel Hermenegildo, editors. *Proceedings of the 2nd International Workshop on Logic Programming Tools for INTERNET Applications*, ICLP'97, Leuven, July 1997.
- [156] Paul Tarau, Andrew Davison, Koen De Bosschere, and Manuel Hermenegildo, editors. *Proceedings of the 1st Workshop on Logic Programming Tools for INTERNET Applications*, JICSLP'96, Bonn, September 1996.
- [157] K. De Bosschere, B. Demoen, and P. Tarau, editors. *Proceedings of the ILPS'94 Post-Conference workshop on Implementation Techniques for Logic Programming Languages*, Ithaca, NY, November 1994.
- [158] K. De Bosschere, J.M. Jacquet, and P. Tarau, editors. *Proceedings of the ICLP'93 Post-Conference Workshop on Blackboard-Based Logic Programming*, Budapest, Hungary, June 1993.

Intellectual Property

- Patent Application *Graph-based Ranking Algorithm for Text Processing* published as US-2005-0278325-A1 (with Dr. Rada Mihalcea and University of North Texas)

Software development

Follow links from <http://www.cs.unt.edu/~tarau> for current versions.

- Development of the Jinni Prolog compiler and the Prolog3D agent based 3D animation software - about 22,000 lines of Java and Prolog code
- WordNet Prolog based Voice-enabled Conversational Agent
- Jinni high performance Java based Prolog compiler 1997-2004
- PocketJinni Prolog system for Java-enabled PDAs and Wireless Phones
- Kernel Prolog: a Refactoring of ISO-Prolog for Interoperation with Object Oriented Languages
- The jProlog experimental Prolog-to-Java translator (joint work with Bart Demoen from K.U. of Leuven, Belgium)
- BinProlog Multi-Threaded Prolog Compiler 1990-2004
 - current version has about 50 000 lines of Prolog and C-code
 - based on a novel BinWAM abstract machine, a specialization of the WAM to continuation passing binary programs
 - using original term-compression techniques

- support for efficient higher order programming
 - full Prolog system with run-time emulator
 - translator to C, modules, debugger
 - Tcl/Tk and Java visual programming interface
 - segment preserving copying heap garbage collector (joint work with Gert Engels and Bart Demoen from K.U. of Leuven, Belgium)
 - support for hypothetical reasoning with linear and intuitionistic implication (joint work with Veronica Dahl and Stephen Rochefort from Simon Fraser University)
 - integrated Linda client/server based on Unix sockets and Winsock
- an OR-parallel binary program evaluator 1990
 - an energy minimization based automatic Tetris player 1990
 - 4 prototype Prolog interpreters (in APL, Lisp, Pascal and C) 1986-1989
 - an expert system on computer security in Prolog 1988-1989
 - a Prolog interpreter and compiler in TurboProlog 1987
 - an expert system with natural language interface in Lisp 1985-1986

Other experience and skills

Industrial experience:

- 1999, founder and President of BinNet Corp., a Web based AI software startup
- supervision of student teams working on various industrial contract projects
- software development (1985-86) at the Government of Quebec, Canada

Language Implementation and Logic programming skills:

- Java networking and client-server programming (10000 lines of Java code written)
- Interoperation of Java with languages like C using the java native Interface
- Java-based lexical analysis, parsing, compiler technologies (2000 lines of code written)
- Prolog implementation, WAM-optimizations, run-time environments (more than 80000 lines of C and Prolog code written and maintained)
- J# and C# based .NET# programming
- Internet applications of logic programming
- graphical user interfaces for logic programming languages
- compilation and program transformations, logic grammars
- alternative logic languages: Lambda-Prolog, Life, Goedel, Lolli
- parallel logic programming languages: GHC, Concurrent Prolog, Multi-BinProlog
- constraint programming languages, clp(fd), clp(R)

- meta-interpretation and partial evaluation
- higher-order logic programming
- functional and object oriented extensions to Prolog, monades
- knowledge bases, hypothetical reasoning
- linear and intuitionistic logic based Prolog extensions
- expert system development and data-mining techniques

Computer skills:

Programming and knowledge representation languages I am fluent in:

- Java, C, C#,C++, Tcl/Tk, HTML, VRML, Unix shell programming (sh, csh)
- Prolog, CHR, Life, Lambda-Prolog, Mercury, CLP(R), clp(FD)
- Haskell, ML, Miranda, Scheme, Lisp
- Ruby, Python, Perl, PHP, XML, RDF, OWL
- Pascal, Fortran, Cobol, Basic, SQL
- Sparc and x86 Assembler

Operating environments:

- Expert knowledge of UNIX (OS X and Linux) and Windows administration, networking, LANs, WANs
- Configured/installed Unix DNS and NIS servers, various X-window managers WWW clients and servers, Gbytes of Unix and PC software.
- Extensive knowledge of PC software and hardware, communications, networking, socket programming etc.
- Various Java and .NET Projects for Pocket PC and Windows Mobile PDAs and cell phones

Natural Languages:

- fluently speaking: English, French, Hungarian, Romanian
- reading ability in: German, Italian, Spanish

Hobbies:

- computer programming, travel, rollerblading, online investments, chess, modern paintings, classical music