

Biographical Sketches

Peter Buneman

O. Peter Buneman

1990-present Professor of Computer Science, Department of Computer and Information Science, University of Pennsylvania.

1981-1989 Associate Professor of Computer Science, Department of Computer and Information Science, University of Pennsylvania.

1981-1987 Graduate Chairman, Department of Computer and Information Science, University of Pennsylvania

1975-1981 Assistant Professor of Computer Science at the Moore School and Assistant Professor of Decision Sciences at the Wharton School, University of Pennsylvania.

1969-1974 Research Associate and subsequently Lecturer in the School of Artificial Intelligence, Edinburgh University.

Education

PhD in Mathematics, University of Warwick (Supervisor E.C. Zeeman), 1970. MA in Mathematics, Cambridge, 1966. Major Scholar in Mathematics at Gonville and Caius College, Cambridge. 1963

Research Interests

Databases: Programming Language Interfaces, Data models, Knowledge Bases, Database Semantics User Interfaces, Query Languages, Distributed Databases, Alerting and real time systems, Database Implementation Techniques, Biological Databases. **Programming Languages:** Database Interfaces, Applicative and Functional Languages, Type systems, Implementation Techniques, Semantics. **General:** Bioinformatics, Artificial Intelligence, Cognitive Science, Data structures, Graph Theory, Combinatorics, Applications of Computers in the Humanities.

Visiting Positions

Visiting Research Fellow, Kyoto University, Sponsored by Japan Society for Advancement of Science, April 1997.

Visiting Research Fellowship sponsored by the British Science and Engineering Research Council 1991, Imperial College, London.

Visiting Researcher, INRIA, Rocquencourt, France, February 1990.

Visiting Research Fellowship sponsored by the British Science and Engineering Research Council 1984-85.

Professional Activities

Member ACM and IEEE; editorial Board, Database Journal; associate Editor, VLDB Journal. Referee for ACM Transactions on Programming Languages and Systems, ACM Transactions on Database Systems, Communications ACM, ACM Computing Surveys, IEEE Transactions on Computers, IEEE Transactions on Knowledge Engineering, IEEE Transactions on Software Engineering, J. Comb. Theory, Discrete Mathematics, Computer Journal, Software Practice and Experience, Journal of Parallel Programming.

Committees etc. (since 1990): Program Chair, Int. Conf. Database Theory, 1998 Program committee, VLDB, 1998. Program Committee, Multimedia Workshop, 1997 Co-organizer, Workshop on semistructured data, 1997 Program Committee, ACM Sigmod, 1997 Co-organizer, POS'96 – Persistent Object Systems Workshop. Organizer, POS'96 – Persistent Object Systems Workshop. Program Committee, 1995 NGITS. Program Committee, 1994 Persistent Object Systems Workshop. Program Committee, 1994 Intl. Conf on Very Large Databases. Program Committee, 1994 Principles of Database Systems. Program Chair, ACM Sigmod, 1993. Program Committee, 1992 Persistent Object Systems Workshop. Organizer, Abingdon Workshop on Information Structures. Program Committee, ACM Sigmod, 1992. Program Committee, Deductive Object-oriented databases, Munich, December 1991. Program Committee, ACM SIGPLAN Conference on Programming Language Design and Implementation, June 1990. External examiner, Oxford University. Organizer, US-France workshop on Types and Data models, Pennsylvania, May, 1990 Rapporteur, Thèse d'état de M. Philippe Richard, Université de Paris.

Program Committee, VLDB conference, Australia, September, 1990. Program Committee, IEEE International Conference on Computer Languages, Florida, 1990.

Teaching

Graduate and undergraduate courses and graduate seminars on databases. Introductory and advanced graduate courses on programming languages. Analysis of algorithms (graduate). Data and file Structures (graduate and undergraduate). Undergraduate graph theory.

Current and Recent Collaborators.

Serge Abiteboul, INRIA; Jonathan Crabtree, University of Pennsylvania; Susan Davidson, University of Pennsylvania; Wenfei Fan, University of Pennsylvania; Gerd Hillebrand, Universität Karlsruhe Anthony Kosky, Lawrence Berkeley Laboratories; Leonid Libkin, Lucent; Atsushi Ohori, Kyoto University; Christian Overton, University of Pennsylvania; Loiqa Raschid, University of Maryland; Dan Suciu, AT&T; Val Tannen, University of Pennsylvania; Jeffery Ullman, Stanford University; Scott Weinstein, University of Pennsylvania; Limsoon Wong, Singapore Institute for System Science.

Advisees and Postdoctoral collaborators (last 5 years)

PhD Students: Wenfei Fan, University of Pennsylvania; Anthony Kosky, Lawrence Berkely Laboratories; Leonid Libkin, Lucent; Arnaud Sahuguet, University of Pennsylvania; Wang-Chiew Tan, University of Pennsylvania; Limsoon Wong, Singapore Institute for System Science; Li Yuo, University of Pennsylvania. PostDocs: Gerd Hillebrand, Universität Karlsruhe, Zoë Lacroix, University of Pennsylvania. Total PhD students (current and past): 12. Total postdocs: 4.

Relevant publications

- Programming Constructs for Unstructured Data (with S.B. Davidson and D. Suciu), DBPL '95
- A Query language and Optimization Techniques for Unstructured Data (with S.B. Davidson, G. Hillebrand and D. Suciu) Proc. ACM Sigmod, June 1996.
- Adding Structure to Unstructured Data. (with S.B. Davidson, M. Fernandez and D. Suciu) International Conference on Database Theory, Delphi, Greece, January 1997.
- Semi-structured data. PODS tutorial, May 1997
- Principles of Programming with Complex Objects and Collection Types (with S. Naqvi, V. Tannen and L. Wong) *Theoretical Computer Science*, 149,1 September 1995.

Less relevant publications

- Using Powerdomains to Generalize Relational Databases. *Theoretical Computer Science*, 23-55, Vol 91 (1991) (with A. Ohori and A. Jung)
- A Semantics for Complex Objects and Approximate Queries *Journal of Computer and System Sciences* 170-218 43,1 1991 (with S. Davidson and A. Watters)
- "Theoretical Aspects of Schema Merging," *Extending Database Technology* Vienna, March 23-27, 1992 (with S. Davidson and A. Kosky)
- A Data Transformation System for Biological Data Sources (with S.B. Davidson, K. Hart, C. Overton, and L. Wong) Proc. VLDB '95, Zurich, Switzerland
- Polymorphism and Type Inference in Database Programming *ACM Transactions on Database Systems* June 1996. (with A. Ohori)

Curriculum Vitae
Daniel J. Dougherty
October 1997

Department of Mathematics
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electronic mail: ddougherty@wesleyan.edu

Education

B.A. (Mathematics) University of Maryland, 1974.
Ph.D. (Mathematics) University of Maryland, 1982.
Dissertation: *On the Complexity of Propositional Proof Systems*, directed by J. C. Owings, Jr.

Employment

Dartmouth College: John Wesley Young Instructor (1982-1984).
Wesleyan University: Assistant Professor of Computer Science (1984-1991),
Associate Professor of Computer Science (1991-present).

Publications

1. Gentzen systems, resolution, and literal trees. *Notre Dame Journal of Formal Logic* **27** (1986), 483–503.
2. Decomposition of infinite matrices. *Journal of Combinatorial Theory* (Series A) **45** (1987), 277–289.
3. Closed categories and categorial grammar. *Notre Dame Journal of Formal Logic* **34** (1993), 36–49.
4. An improved general E -unification method (with Patricia Johann). *Journal of Symbolic Computation* **14** (1992), 303–320. A preliminary version appeared in: *Proc. Tenth Intl. Conf. on Automated Deduction*, Springer-Verlag Lecture Notes in Artificial Intelligence 449, (1990) 261–75.
5. Adding algebraic rewriting to the untyped lambda calculus. *Information and Computation* **101-2** (1992) 251–267. A preliminary version appeared in: *Proc. Fourth Intl. Conf. on Rewriting Techniques and Applications*, Springer-Verlag LNCS 488, (1991) 37–48.
6. Higher-order unification via combinators. *Theoretical Computer Science* **114** (1993), 273–298.
7. A combinatory logic approach to higher-order E -unification (with Patricia Johann). *Theoretical Computer Science* **139** (1995), 207–242. A preliminary version appeared in *Proc. Eleventh Intl. Conf. on Automated Deduction*, Springer-Verlag Lecture Notes in Artificial Intelligence (1992)
8. Some λ -calculi with categorical sums and products. *Proc. Fifth Intl. Conf. on Rewriting Techniques and Applications*, Springer-Verlag, LNCS 690, (1993) 135–151.
9. Equality between functionals in the presence of coproducts (with Ramesh Subrahmanyam). To appear, *Information and Computation*. A preliminary version appeared in *Proc. Tenth IEEE Symposium on Logic in Computer Science*, San Diego, 1995.
10. Some independence results for equational unification (with Freidrich Otto and Paliath Narendran). To appear, *Theoretical Computer Science*. A preliminary version appeared in *Proc. Sixth Intl. Conf. on Rewriting Techniques and Applications*, Kaiserslauten, Germany, 1995.

In preparation

1. Strong Normalization in Calculi of Explicit Substitutions (with Pierre Lescanne). In preparation. A preliminary version has been presented at the 1997 Termination Workshop, Utrecht.
2. Decidable fragments of higher-order matching. Manuscript, 30 pp.

Thesis Supervision

- Patricia Johann, Ph.D., Wesleyan University 1991.
- Claudio Gutierrez, Ph.D. candidate, Wesleyan University.
- Vladimir Gapeyev, M.A., Wesleyan University, 1997.
- Sha Ye, M.A., Wesleyan University, 1996.
- Richard Silverman, M.A., Wesleyan University, 1994. logic.
- Janelle Stevenson, M.A., Wesleyan University, 1990.
- Joan Calvert, M.A., Wesleyan University, 1990.
- Martin Reames, B.A., Wesleyan University 1994.
- Joshua Loewenstein, B.A., Wesleyan University 1992.
- Nikolaus Haus, B.A., Wesleyan University 1991.

Professional Activities

Program Committee: Higher-Order Algebra '97, Algebraic and Logic Programming '97 (combined conferences in 1997)

Refereeing/Reviewing: American Mathematical Monthly; Applicable Algebra in Engineering, Communication, and Computing; Conference on Automated Deduction 1992; Information and Control; Journal of Symbolic Computation; Mathematical Structures in Computer Science; Rewriting Techniques and Applications conferences 1991, 1993, 1995, 1996; Journal of Symbolic Logic; Computing Reviews.

Member: Association for Computing Machinery, Association for Symbolic Logic.

Grants

- Co-principal investigator, Office of Naval Research grant N-00014-95-1-0634: Computing with Relations — Combinatory Logic Programming, Types and Allegories. (with Peter Freyd, Jim Lipton), 1995–96.
- Co-principal investigator, U.S. Dept of Education grant: Graduate Assistance in Areas of National Need (with Carol Wood), 1995–97; renewed 1997–99.

PETER J. FREYD

Born: February 5, 1936, Evanston, Illinois
Brown University 1954-58; B.A. Magna cum Laude with highest honors in mathematics
Princeton University, 1958-60; M.A. and Ph.D. 1960
Academic Positions:
1960-1962 Ritt Instructor, Columbia University
1962-1964 Assistant Professor, University Pennsylvania
1963 (summer) Principal Lecturer, NSF Regional Session, Pennsylvania State University
1964-1967 Associate Professor, University of Pennsylvania
1964-1968 Associate Chairman of Undergraduates, Department of Mathematics, University of Pennsylvania
1965 (summer) Visiting Professor, University of Chicago
1966 (summer) Principal Lecturer, ONR seminar on Algebra, Bowdoin College
1968- Professor, University of Pennsylvania
1968 (autumn) Visiting Professor and Advisor, Pahlavi University, Shiraz, Iran
1969 (spring) Visiting Professor, ETH, Zurich, Switzerland
1970- Managing Editor, Journal of Pure and Applied Algebra, North Holland
1971 (autumn) Senior Fulbright Fellow, University of New South Wales, Australia
1973 (summer) Principal Lecturer, National Science Board Research Seminar, University of Montreal
1974 (summer) Visiting Professor, University of Mexico
1980 (summer) Visiting Professor, University of Chicago
1980-81 Overseas Fellow, St. John's College, Cambridge, England
1981 (summer) Visiting Professor, University of Louvain, Louvain La Neuve, Belgium
1984-87 Chairman of the Graduate Group in Mathematics, University of Pennsylvania
1985 (summer) Visiting Professor, University of Sydney, Australia
1986 (summer) Visiting Professor, University of Milan, Italy
1986- Professor of Computer and Information Science, University of Pennsylvania (secondary appointment)
1988-89 Visiting Professor (Computer Science) Carnegie Mellon University
1989- Editorial Board, Theoretical Computer Science, North Holland 1990 (summer) Visiting Professor, University of Parma, Italy
1990- Editorial Board, Mathematical Structure in Computer Science, Cambridge University Press
1990- Editorial Board, Knot Theory and its Ramifications, World Scientific
1991 (summer) Principal Lecturer, London Mathematical Society Summer Colloquium, Durham, U.K.
1993 (summer) Principal Lecturer, E.C. Summer Institute (TEMPUS) in Theoretical Computer Science, Brno, Czech Republic
1995 (summer, autumn) Member, Issac Newton Institute, Cambridge, U.K.

SELECTED PUBLICATIONS

Aspects of Topoi, Bull. Austral. Math. Soc., Vol. 7, 1972.

The Axiom of Choice, S. Mac Lane's Festschrift, Journal of Pure and Applied Algebra, Vol. 19, 1980.

(with D.Yetter, J.Hoste, W.P.R.Licorish, K.Millett, A.Ocneanu) A new polynomial invariant of knots and links, Bull. A.M.S. April 1985.

Choice and Well-Ordering, Vol. 35, 1987, Ann. Pure Appl. Logic.

(with A.Scedrov), Categories, Allegories, North Holland, 1990.

Remarks on Algebraically Compact Categories, Applications of Categories in Computer Science, Proceedings of the LMS Symposium, Durham 1991, London Mathematical Society Lecture Note Series, 177, Cambridge University Press, 1992

(with P. Mulry, G. Rosolini and D. Scott) Extensional PERs. Selections from the 1990 IEEE Symposium on Logic in Computer Science. Inform. and Comput. 98 (1992), no. 2

Structural polymorphism. 4th Summer Conference on Category Theory and Computer Science (Paris, 1991). Theoret. Comput. Sci. 115 (1993), no. 1

(with and Stacy Finkelstein and James Lipton) Logic Programming and Tau-Categories, LNCS 933, Computer Science Logic '94, Springer

(with and Stacy Finkelstein and James Lipton) A New Framework for Declarative Programming, in press, Theoretical Computer Science

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Madrid, SPAIN

Education

- Ph.D., Electrical and Computer Engineering, University of Texas at Austin, August 1986. Advisors: Jack Lipovski and Jim Browne.
- M.S., Electrical and Computer Engineering, University of Texas at Austin, August 1984. Advisors: Jack Lipovski and Jim Browne.
- M.Eng., Electrical Engineering, Technical U. of Madrid., June 1981.

Professional Appointments

- Full Professor, Technical U. of Madrid, Department of Computer Science, Spain, May 1994 – present.
- Associate Professor, Technical U. of Madrid, Department of Computer Science, Spain, January 1990 – May 1994.
- Member, Technical Staff and Group Leader, Microelectronics and Computer Technology Corporation, Parallel Processing and Software Technology Programs, Austin, Texas, October 1986 – December 1989.
- Assistant Professor (adjunct), University of Texas at Austin, Computer Science Department, March 1987 – December 1989.
- Research Assistant, University of Texas at Austin, Department of Electrical and Computer Engineering, September 1984 – August 1986.
- Fulbright Scholar, University of Texas at Austin, Department of Electrical and Computer Engineering, September 1983 – August 1984.

Five Publications Closely Related to the Proposal

- *Using Global Analysis, Partial Specifications, and An Extensible Assertion Language for Program Validation and Debugging.* To appear in “The Logic Programming Paradigm: Current Trends and Future Directions,” Lecture Notes in Computer Science, Springer. With G. Puebla and F. Bueno.
- *On the Role of Semantic Approximations in Validation and Diagnosis of Constraint Logic Programs.* Proc. of the 3rd. Int'l Workshop on Automated Debugging-AADEBUG'97, May 1997. With F. Bueno, P. Deransart, W. Drabent, G. Ferrand, J. Maluszynski, and G. Puebla.
- *Abstract Multiple Specialization and its Application to Program Parallelization.* To appear in Journal of Logic Programming, Special Issue on Synthesis, Transformation and Analysis of Logic Programs, Elsevier - North Holland. With G. Puebla.
- *Lower Bound Cost Estimation for Logic Programs.* 1997 International Logic Programming Symposium, MIT Press, Cambridge, MA, October 1997. With S. K. Debray, P. López-García, and N.-W. Lin.
- *Non-Failure Analysis for Logic Programs.* 1997 International Conference on Logic Programming, MIT Press, June 1997. With S. K. Debray, and P. López García.

Five Other Publications

- *Global Analysis of Constraint Logic Programs.* ACM Transactions on Programming Languages and Systems, Vol. 18, Num. 5, ACM, 1996. With M. García de la Banda, M. Bruynooghe, V. Dumortier, G. Janssens, and W. Simoens.

- *Analyzing Logic Programs with Dynamic Scheduling*. 20th. Annual ACM Conf. on Principles of Programming Languages, pages 240–254, ACM, January 1994. With K. Marriott and M. García de la Banda.
- *Compile-time Derivation of Variable Dependency Using Abstract Interpretation*. Journal of Logic Programming, Vol. 13, Num. 2/3, Elsevier - North-Holland, July 1992. With K. Muthukumar.
- *Effectiveness of Abstract Interpretation in Automatic Parallelization: A Case Study in Logic Programming*. To appear in ACM Transactions on Programming Languages and Systems, ACM Press. With F. Bueno and M. García de la Banda.
- *Improving Abstract Interpretations by Combining Domains*. ACM Transactions on Programming Languages and Systems, Vol. 17, Num. 1, ACM, January 1995. With M. Codish, A. Mulkers, M. Bruynooghe, and M. García de la Banda.

Recent Collaborators and Students

Former Graduate Students: Kalyan Muthukumar (IBM San Jose / Apple research), Yow-Yan Lin (Bellcore), María García de la Banda (Melbourne University), Francisco Bueno (T.U. Madrid), Germán Puebla (T.U. Madrid).

Collaborators in Past Four Years: U. Montanari (U. Pisa), F. Rossi (U. Pisa), Giorgio Levi (U. Pisa), P. Stuckey (Melbourne U.), K. Marriott (Monash U., Australia), E. Pontelli (New Mexico S.U.), G. Gupta (New Mexico S.U.), S. Debray (U. of Arizona), K. Shen (Imperial College), M. Codish (Ben Gurion U.), M. Bruynooghe (K.U. Leuven, Belgium).

CURRICULUM VITAE ET STUDIORUM
GIORGIO LEVI

- Full professor of Computer Science, Università di Pisa.
Dipartimento di Informatica, Corso Italia, 40, 56125 Pisa (ITALY)
(phone) (+39)(+50) 887246 (Fax) (+39)(+50) 887226
levi@di.unipi.it
- Born on July 20 1942 in Trieste.
- Author of about 120 publications in International Journals and Conference Proceedings.
- Current research interests: Semantics, Logic Programming, Program analysis and verification.
- Editor-in-Chief of the International Journal of Functional and Logic Programming, Editor for the area Theory of the Journal of Logic Programming, Member of the Editorial Board of Theoretical Computer Science.
- Member of the program committee of several editions of ICLP, ILPS, FGCS, PLILP, ICALP, ALP, SAS, AMAST.
- Program Chairman of the “Workshop on Foundations of Logic and Functional Programming” (1986), of “TAPSOFT’87” (1987), of the “Sixth International Conference on Logic Programming” (1989), of the “Third and Fourth International Conferences on Algebraic and Logic Programming” (1992, 1994) and of the “Static Analysis Symposium” (1997).
- Member of the Board of the European Association for Programming Languages and Systems and of the Executive Committee of the NOE “Computational Logic” and area coordinator for “Languages, Analysis and Verification”.

Selected Publications

- [1] R. Barbuti, M. Codish, R. Giacobazzi, and G. Levi. Modelling Prolog Control. *Journal of Logic and Computation*, 3:579–603, 1993.
- [2] R. Barbuti, R. Giacobazzi, and G. Levi. A General Framework for Semantics-based Bottom-up Abstract Interpretation of Logic Programs. *ACM Transactions on Programming Languages and Systems*, 15(1):133–181, 1993.
- [3] A. Bossi, M. Bugliesi, M. Gabbrielli, G. Levi, and M.C. Meo. Differential Logic Programs: Programming Methodologies and Semantics. *Science of Computer Programming*, 1996.
- [4] A. Bossi, M. Gabbrielli, G. Levi, and M. Martelli. The s-semantics approach: Theory and applications. *Journal of Logic Programming*, 19–20:149–197, 1994.
- [5] A. Bossi, M. Gabbrielli, G. Levi, and M. C. Meo. A Compositional Semantics for Logic Programs. *Theoretical Computer Science*, 122(1–2):3–47, 1994.
- [6] M. Falaschi, G. Levi, M. Martelli, and C. Palamidessi. A Model-Theoretic Reconstruction of the Operational Semantics of Logic Programs. *Information and Computation*, 102(1):86–113, 1993.
- [7] M. Gabbrielli, G. M. Dore, and G. Levi. Observable semantics for constraint logic programs. *J. Logic Computation*, 5(2):133–171, 1995.
- [8] M. Gabbrielli, G. Levi, and M. C. Meo. Observable Behaviors and Equivalences of Logic Programs. *Information and Computation*, 122(1):1–29, 1995.
- [9] M. Gabbrielli, G. Levi, and M. C. Meo. Resultants semantics for PROLOG. *Journal of Logic and Computation*, 6(4):491–521, 1996.
- [10] R. Giacobazzi, S.K. Debray, and G. Levi. Generalized Semantics and Abstract Interpretation for Constraint Logic Programs. *Journal of Logic Programming*, 25(3):191–247, 1995.

James Lipton

James Lipton
Dept. of Mathematics
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Ph. D., Cornell University, 1990. Advisor: Prof. Anil Nerode.

Research Interests Logic Programming, Applied logic, Relational Methods, Categorical Logic, Type Theory, Linear Logic.

Teaching and Research Appointments

Current: Assoc. Prof. of Computer Science, Dept. of Mathematics, Wesleyan University, 1993-

Instructor, Dept. of Mathematics, University of Pennsylvania, 1990-1993.

Visiting Scientist, Mathematical Sciences Institute (MSI), Cornell, summer 1991.

Postdoctoral Research Associate, Dept. of Computer Science and MSI, Cornell University, Jan.-Sept., 1990.

Visiting appointments

Visiting Professor, Technical University of Madrid, October-December, 1997.

Visiting Researcher, University of Pisa, June-October 1997.

Visiting Professor, University of Bahía Blanca, Argentina, August 1996.

Visiting Researcher, Isaac Newton Institute, Cambridge University, August-September 1995.

Visiting Professor of Computer Science, University of Nancy, France, May-June 1994 & 1995.

Selected Publications

1. "A New Framework for Declarative Programming" to appear in *Theoretical Computer Science*, (with Peter Freyd and Stacy Finkelstein), 1998.
2. "Encapsulating Data in Logic Programming via Categorical Constraints", in *Principles of Declarative Programming*, proceedings of ALP'98 and PLILP '98, Springer, LNCS 1490, pp. 391-410.
3. "Some Notes on Logic Programming with a Relational Machine", in *Using Relational Methods in Computer Science*, with Emily Chapman, Institute for Software Technology, Universität Bundeswehr, München, 1998.
4. "Some Intuitions Behind Realizability Semantics for Constructive Logic: Tableaux and Läuchli Countermodels" *Annals of Pure and Applied Logic*, pp. 187-239, vol 81, Elsevier North-Holland, (with Michael O'Donnell), 1996.
5. "Type Theory and Inhabitation: A Constructive Completeness Theorem for Martin-Löf Type Theory" to appear in the *Annals of Pure and Applied Logic*.
6. "Combinatory Logic Programming: Computing in Relation Calculi" in *Proceedings of the 1994 International Symposium on Logic Programming*, M. Bruynooghe, ed., M.I.T. Press, pp. 269-285, (with Paul Broome), 1994.
7. "Logic Programming in Tau-Categories", in *Computer Science Logic '94*, LNCS 933, Springer, pp. 249-263, (with Peter Freyd and Stacy Finkelstein), 1995.
8. "Realizability, Set Theory and Term Extraction", in *The Curry-Howard Isomorphism: 8-ème volume des cahiers du centre de logique de l'Université Catholique de Louvain*, pp. 257-364, 1994.
9. "Provability in TBLL (the Tensor Bang Fragment of Linear Logic)", in *Computer Science Logic* (proceedings of CSL '91, Bern), LNCS 613, Springer-Verlag, pp. 53-67, (with J. Chirimar), 1992.

10. “Constructive Kripke Semantics and Realizability”, in *Logic from Computer Science*, Y. N. Moschovakis, ed., MSRI Publications, vol. 21, Springer, pp. 319-358, 1992.

Short Courses Taught:

2-week course on lambda calculus, type theory and linear logic given at the Latin American Symposium on Mathematical Logic, ASL meeting, Bahía Blanca, Argentina. August 1992.(in Spanish).

5-week course in Intuitionistic and Categorical Logic, University of Nancy, France, May-June 1994. (in French)

2-week course on Linear Logic, Uniform Proof Systems, Categories and Logic Programming, Bahía Blanca, Argentina. August 1996.

Workshops:

Organized “Categories and Logic programming” workshop, Isaac Newton Institute, Cambridge University, Sept. 1995.

Grants:

- 1992-1995: *Programming with Relations*, ONR, \$ 300,000, Co-PI with Peter Freyd, Penn.
- 1995-1997: *Categorical and Relational Logic Programming*, ONR, \$ 200,000, co-PI's Peter Freyd, Penn, Dan Dougherty, Wesleyan, Stacy Finkelstein, McGill.
- 1995-1996: Travel grant to participate in the *Semantics of Computation* programme, Newton Institute, Cambridge University, Fall '95, ONR, \$20,000, co-PI: Peter Freyd, Penn.

Current Ph. D. Students:

- Robert McGrail, Wesleyan University, topic: *Monads, Control and Side Effects in Logic Programming*.
- Mary de Marco, Wesleyan University, topic: *Categorical Proof Theory and Semantics of Linear Logic Constraint Programming Languages*.
- Claudio Gutierrez, Wesleyan University, topic: *Relational and Functional Programming*.

Current M. A. Students:

- Matt Ruhlen, Wesleyan University, *Relational Compilation of Declarative Programs*.

Dale Miller

Department of Computer Science and Engineering
Pennsylvania State University, 220 Pond Laboratory
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Employment

- 9/97 – present: Professor and Head, Penn State University
- 8/89 – 9/97: Associate Professor, University of Pennsylvania
- 9/83 – 7/89: Assistant Professor, University of Pennsylvania
- 9/78 – 8/83: Research Assistant, Carnegie Mellon University
- Summers 77, 78: Mathematician, AI Lab, National Bureau of Standards

Supported Visiting Positions

- 23 January – 22 February 1997: Visiting Professor at the University of Siena
- 1 September – 31 October 1996: Visiting Professor at the University of Genoa
- July 1994: Visiting Professor at the Universities of Pisa and Genoa
- July 1991 – September 1991: SERC Visiting Fellow, University of Glasgow
- September 1990 – June 1991: Visiting Research Scientist, University of Edinburgh

Recent Professional Activities

- Instructor for the International Summer School on the Logic of Computation, Marktoberdorf, Germany, during 1995 and 1997.
- Editorial Duties: Founding member of the Editorial Board for *Electronic Journal of Theoretical Computer Science and Discrete Mathematics*. • Permanent member of the Editorial Board *Journal of Functional and Logic Programming* (MIT Press). • Editorial Advisor for the *Journal of Logic Programming* (North-Holland). • Associate editor for *Journal of Logic and Computation* (Oxford University Press).
- Elected to the Executive Council of the Association for Logic Programming for four years starting 1 January 1991.
- Organizing Committee for LICS (Logic in Computer Science), July 1993 - July 1997
- ILPS 93: International Symposium on Logic Programming, Vancouver, Fall 1993 (Program Committee Chair).
- Program Committee for the following recent meetings. LICS: Logic in Computer Science, 1993, 1995, 1998.
 - JICSLP 96: Joint International Conference and Symposium on Logic Programming, Bonn, November 1996.
 - PLILP 96: International Conference on Programming Languages, Implementations, and Logic Programming, Aachen, Germany, September 1996.
 - WELP'96: Workshop on Extensions to Logic Programming, 28 – 30 May 1996, Leipzig, Germany.
 - ILPS 95: International Symposium on Logic Programming, Portland, Oregon, December 1995.
 - ICCL 94: International Conference on Constraints in Computational Logics, 7 – 9 September 1994, Munich.
 - ASL 94: Annual Meeting of the Association of Symbolic Logic, March 1994, Gainesville.
 - POPL 94: The 21st Annual Symposium on Principles of Programming Languages, January 1994.
 - LPAR 93: International Conference on Logic Programming and Automated Reasoning, St. Petersburg, July 1993.
 - Linear Logic Workshop, Cornell University, June 1993.

Selected Recent Publications

1. “Forum: A Multiple-Conclusion Specification Logic”. *Theoretical Computer Science*, Vol. 165, 201-232 (1996).
2. “Logic Programming in a Fragment of Intuitionistic Linear Logic,” with Josh Hodas. *J. of Information and Computation*, 110(2), 327-365 (1994).

3. “A Logic Programming Language with Lambda-Abstraction, Function Variables, and Simple Unification,” *J. of Logic and Computation*, 1(4), 497 – 536 (1991).
4. “Uniform proofs as a foundation for logic programming” with Gopalan Nadathur, Frank Pfenning, and Andre Scedrov, *Annals of Pure and Applied Logic*, Vol. 51 (1991), 125 – 157.
5. “Higher-order Horn clauses” with Gopalan Nadathur, *J. ACM*, 37(4), 777 – 814 (1990).
6. “Unification under a mixed prefix.” *J. of Symbolic Computation*, Vol. 14, 321-358 (1992).
7. “From Operational Semantics to Abstract Machines” with John Hannan. *J. of Mathematical Structures in Computer Science*, 2(4), 415-459 (1992).

Invited Lecturer at Some Recent Conferences, Workshops, and Schools

- TYPES'96: Workshop on Types, Aussois, France, 16-19 December 1996.
- Conference on Logical Aspects of Computational Linguistics, Nancy, 23-25 September 1996.
- Conference on Logics and Models of Computation, Marseille, 16 – 20 September 1996.
- Linear Logic '96, Tokyo, Japan, 29 March – 2 April 1996.
- New Zealand Formal Program Development Colloquium, Massey, 14 - 15 Feb 1996.
- Computing: The Australian Theory Seminar (CATS), Melbourne, 29 – 30 January 1996.
- Ninth Conference on the Mathematical Foundations of Programming Semantics (MFPS), 7 - 10 April 1993, New Orleans, LA.
- Fourth International School for Computer Science Researchers, Acireale, Sicily, 22 June – 4 July 1992.
- Second Russian Conference on Logic Programming, 11 – 15 September 1991, St. Petersburg, Russia.
- Third European Summer School in Language, Logic, and Information, Saarbrücken, 12–23 August 1991.

Oege de Moor has been an invited speaker at the following conferences: International Summer School on Constructive algorithmics (1989, 1992)

IFIP State-of-the-Art Seminar on Formal Program Development (Rio de Janeiro 1992)

Programming Languages: Implementations, Logics and Programs (PLILP) '95

Dagstuhl seminar on "Programs: Meanings, Complexity, Improvements" 3rd International Summer School on Advanced Functional Programming (Braga 1998)

Oege de Moor is a member of IFIP Working Group 2.1 on Algorithmic Languages and Calculi. He has been a referee for Theoretical Computer Science, Science of Computer Programming, Formal Aspects of Computing, Zentralblatt für Mathematik, Information Processing Letters, IEEE Transactions on Software Engineering, and numerous conferences.

Selected Publications

- [1] R. S. Bird and O. De Moor. List partitions. *Formal Aspects of Computing*, 5(1):61–78, 1993.
- [2] R. S. Bird and O. De Moor. *Algebra of Programming*, volume 100 of *International Series in Computer Science*. Prentice Hall, 1996.
- [3] O. De Moor. Categories, relations and dynamic programming. *Mathematical Structures in Computing Science*, 4:33–69, 1994.
- [4] O. De Moor. A generic program for sequential decision processes. In M. Hermenegildo and D. S. Swierstra, editors, *Programming Languages: Implementations, Logics, and Programs*, volume 982 of *Lecture Notes in Computer Science*. Springer-Verlag, 1995. Invited Paper.
- [5] P. H. B. Gardiner, C. E. Martin, and O. De Moor. An algebraic construction of predicate transformers. *Science of Computer Programming*, 22(1-2):21–44, 1994.

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Education

- Ph.D., Computer Science, University of Pennsylvania, May 1987
Advisor: Dale Miller
- M.Engg., Automation (Computer and Systems Science), Indian Institute of Science, Bangalore, August 1979
Advisors: Mathai Joseph, S.V. Rangaswamy
- B.Tech., Electrical Engineering, Indian Institute of Technology, Kharagpur, July 1977.

Professional Appointments

- Associate Professor, University of Chicago, Jan 1995 – present.
- Visiting Professor, University of Munich, Feb – July, 1995. Funded by a special award from the Konrad-Zuse Programm.
- Assistant Professor, Duke University, Jan 1987 – Dec 1994.
- Visiting Assistant Professor, University of Chicago, Jan 1991 - June 1991.
- Teaching and Research Assistant, University of Pennsylvania, Sept. 1980 - Dec. 1986.
- Research Fellow, NCSICT, Tata Institute of Fundamental Research, India, Dec. 1978 - July 1979.

Recent and Upcoming Professional Activities

- Program Chair — International Conference on Principles and Practice of Declarative Programming (PPDP), 1999.
- Instructor at the Eleventh European Summer School in Logic, Language and Information (ESSLLI), 1999.
- Moderator for the *Computing Research Repository for Computer Science*. (Subareas: Programming Languages and Logic in Computer Science.)
- Program Committee Member: Fuji International Symposium on Functional and Logic Programming (FLOPS), 1999, Programming Languages, Implementations, Logics and Programs/Algebraic and Logic Programming (PLILP/ALP), 1998, Algebraic and Logic Programming (ALP), 1997, International Workshop on Extensions of Logic Programming (ELP), 1996, International Logic Programming Symposium (ILPS), 1993.

Publications or Software Systems Related to the Proposal

- Chicago Lambda Prolog. A compiler and abstract machine based implementation of the λ Prolog language. Currently in a beta release version.
- A fine-grained notation for lambda terms and its use in intensional operations, to appear in *Journal of Functional and Logic Programming*.
- Scoping constructs in logic programming: implementation problems and their solution, *Journal of Logic Programming* 25(2): 119–161, 1995. (With B. Jayaraman and K. Kwon.)
- Implementing polymorphic typing in a logic programming language, *Computer Languages* 20(1):25–42, 1994. (With K. Kwon and D. S. Wilson.)
- A logic programming approach to manipulating formulas and programs, *Proceedings of the Fourth Symposium on Logic Programming*, San Francisco, 1987, 379 – 388. (With D. Miller.)

Five Other Publications

- A notation for lambda terms: A generalization of environments. *Theoretical Computer Science* 198(1-2):49–98. (With D. S. Wilson.)
- Higher-order logic programming, *Handbook of Logic in Artificial Intelligence and Logic Programming*, D. Gabbay, C. Hogger and A. Robinson (eds.), Oxford University Press, January 1998, pages 499–590. (With D. Miller.)
- Realizing modularity in λ Prolog. To appear in *Journal of Functional and Logic Programming*. (With G. Tong.)
- A proof procedure for hereditary Harrop formulas, *Journal of Automated Reasoning* 11: 115 – 145, 1993.
- Uniform proofs as a foundation for logic programming, *Annals of Pure and Applied Logic* 51 (1991) 125 – 157. (With D. Miller, F. Pfenning, and A. Scedrov.)

Recent Collaborators, Graduate Advisor and Students

Graduate Advisor: Dale Miller.

Former Graduate Students: Keehang Kwon (Duke), Debra Sue Wilson (Duke). Shyan-Ming Perng (U. Chicago).

Collaborators in Past Four Years: Bharat Jayaraman (SUNY, Buffalo), Lyn Headley (U. Chicago), Donald W. Loveland (Duke), Dale Miller (Penn State), Dustin Mitchell (U. Chicago), Michael O'Donnell (U. Chicago), Guanshan Tong (U. Chicago).

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Education

B.S.	Computer Sciences	Highest Distinction	Purdue University	1972
Ph.D.	Computer Science	R. Constable, advisor	Cornell University	1976

Employment

Research Associate	University of Toronto	1976–1977
Assistant Professor	Purdue University	1976–1981
Associate Professor	Purdue University	1981–1985
Visiting Associate Professor	The Johns Hopkins University	1983–1984
Associate Professor	The Johns Hopkins University	1984–1985
Professor	University of Chicago	1985–present
Associate Chairman C.S.	University of Chicago	1986–1987
Chairman of C.S. Dept.	University of Chicago	1987–1990
Visiting Professor	University of Iowa	1996–1997

Publications and software relevant to the proposal

- Introduction: Logic and Logic Programming Languages. Chapter 1 of *Handbook of Logic in Artificial Intelligence and Logic Programming*, volume 5 on Logic Programming, D. Gabbay editor, Oxford University Press. To appear.
- Equational Logic Programming. Chapter 2 of *Handbook of Logic in Artificial Intelligence and Logic Programming*, volume 5 on Logic Programming, D. Gabbay editor, Oxford University Press. To appear.
- Exact real arithmetic: a case study in higher order programming (with H-J. Boehm, R. Cartwright, and M. Riggle), *1987 Symposium on LISP and Functional Programming*.
- Implementation of an interpreter for abstract equations (with C. Hoffmann and R. Strandh), *Software—Practice and Experience* 15(2):1185–1204, December 1985.
- Programming with equations (with C. Hoffmann), *ACM Transactions on Programming Languages and Systems*, 4(1):83–112, January 1982.

Other publications:

- *Equational Logic Programming* (with C. Hoffmann, G. Sacco, P. Golic, R. Strandh, S. Rebelsky, D. Sherman, S. Bailey), a programming language implemented by a series of interpreters and compilers 1983–1995.

- Some intuitions behind realizability semantics for constructive logic: Tableaux and Läuchli countermodels (with J. Lipton), *Annals of Pure and Applied Logic*, 81:187–239, 1996.
- Intuitive Counterexamples for Constructive Fallacies (with J. Lipton). Mathematical Foundations of Computer Science 1994—19th Annual Symposium, MFCS '94, Kosice, Slovakia, August 1994—Proceedings, Igor Prvara, Branislav Rován and Peter Ruzicka editors, Springer-Verlag, 1994, pp. 87–111.
- *Equational Logic as a Programming Language*, MIT Press, 1985.
- *A Programming Logic* (with R. Constable), Winthrop, 1978.

Collaborators

John Overton, James Lipton, Hans Kaper, Sever Tipei, Gopalan Nadathur.

Graduate Students

Samuel Rebelsky, David Sherman, Donald Ziff, Stephen Bailey, Iliia Bisnovaty, Guanshan Tong.
Total Ph.D. students 9. Total postdoctoral scholars 2.

Advisors

Ph.D. advisor: Robert Constable. Postdoctoral supervisor: Steven Cook.

Catuscia Palamidessi

Department of Computer Science and Engineering, The Pennsylvania State University
325 Pond Laboratory, University Park, PA 16802-6106, USA

PhD in in Computer Science, University of Pisa (Italy), October 1988. Advisor: Giorgio Levi.

Academic Positions

- Jan 98 – present: Professor in Comp. Sci. and Eng., The Pennsylvania State University, USA.
- Nov 94 – Dec 97: Professor in Comp. Sci., Univ. of Genova, Italy.
- Nov 92 – Oct 94: Assoc. Prof. in Comp. Sci., Univ. of Genova, Italy.
- May 88 – Oct 92: Assist. Professor in Comp. Sci., Univ. of Pisa, Italy.
- Nov 90 – Oct 91: Visiting Scientist (in sabbatical leave from Pisa), Centre for Math. and Comp. Sci. (CWI), Amsterdam, The Netherlands.

Recent Professional Activities

- *Chair of International Conferences, Workshops, and Schools.* • Program committee chair of the Joint International PLILP/ALP Symposium. Pisa, 1998. • Co-chair of EXPRESS, Sophia Antipolis, 1998. • Scientific organizer of the International Annual IC-EATC Advanced School on *Models and paradigms for Concurrency*. CISM, Udine, 1997. • Co-chair of EXPRESS, Santa Margherita Ligure, 1997.
- *PC member in International Conferences.* • FOSSACS (Int. Conf. on Theoretical Computer Science), Amsterdam, 1999. • CSL (Computer Science Logic), Madrid, 1999. • MFPS (Mathematical Foundations of Programming Semantics), New Orleans, 1999. • JICSLP (Joint Int. Conf. and Symp. on Logic Programming) Great Britain, 1998. • FOSSACS, Portugal, 1998. • ASIAN (Asian Conf. in Computer Science), Nepal, 1997. • ICLP (Int. Conf. on Logic Programming), Belgium, 1997. • ALP (Int. Conf. on Algebraic and Logic Programming), Great Britain, 1997. • CP (Int. Conf. on Constraint Programming), Austria, 1997. • ALP, Germany, 1996. • CP, USA, 1996. • ILPS (Int. Logic Programming Symp.), USA, 1995. • GULP-PRODE'95 (Spanish-Italian Conf. on Logic and Functional Programming), Italy, 1995. • CP, France, 1995. • CCP (Int. Conf. on Concurrent Constraint Programming), Italy, 1995. • ILPS, USA, 1994. • PASCO (Int. Conf. on Parallel and Symbolic Computation), Austria, 1994. • GULP-PRODE, Spain, 1994. • CONCUR (Int. Conf. on Concurrency), Sweden, 1994. • CONCUR, Germany, 1993. • JICSLP, USA, 1992.
- *Editorial Activity* • Member of the Editorial Board of the *Journal of Logic Programming*, Elsevier Science B.V. • Permanent member of the Editorial Board of the *Electronic Journal of Functional and Logic Programming*, The MIT Press. • Co-editor (with Hugh Glaser and Karl Meinke) of the Proceedings of PLILP/ALP'98, *Lecture Notes in Computer Science* 1490, Springer-Verlag. • Co-editor (with Ilaria Castellani) of the Proceedings of EXPRESS'98, *Electronic Notes of Theoretical Computer Science* 16(2), Elsevier Science B.V. • Editor of the Special Issue of *Theoretical Computer Science* dedicated to selected papers of the IC-EATCS school. Elsevier Science B.V. (Forthcoming.) • Co-editor (with Joachim Parrow) of the Special Issue of *Information and Computation* dedicated to selected papers of EXPRESS'97. The MIT Press. (Forthcoming.) • Co-editor (with Joachim Parrow) of the Proceedings of EXPRESS'97, *Electronic Notes of Theoretical Computer Science* 7, Elsevier Science B.V.
- *Invited Speaker at International Conferences* • CONCUR (International Conference on Concurrency) Eindhoven, 1999. • JFPLC-UNIF (Joint Annual Conference on Constraint and Logic Programming - Unification) Orléans, 1997. • ALP-PLILP (Joint Annual Conference on Algebraic and Logic Programming - Programming Languages Implementation and Logic Programming). Madrid, 1994. • UK ALP (Annual Conference on Logic Programming). London, 1992.

Five Selected Publications

1. R. McDowell, D. Miller, and C. Palamidessi. Encoding Transition Systems in Sequent Calculus. *Theoretical Computer Science*. To appear.

2. D. Miller, and C. Palamidessi. Foundational Aspects of Syntax *ACM Computing Surveys*. To appear.
3. F.S. de Boer, M. Gabbrielli, E. Marchiori, and C. Palamidessi. Proving Concurrent Constraint Programs Correct. *ACM-TOPLAS* 19(5):685–725, 1997.
4. M. Falaschi, M. Gabbrielli, K. Marriott, and C. Palamidessi. Confluence in Concurrent Constraint Programming. *Theoretical Computer Science* 183(2):281–315, 1997.
5. C. Palamidessi. Comparing the expressive power of the Synchronous and the Asynchronous π -calculus. *Proc. of the 24th ACM Sym. on Principles of Programming Languages (POPL)*, 256–265, 1997.

Five Other Publications

1. A. Cortesi, G. Filé, R. Giacobazzi, C. Palamidessi, and F. Ranzato. Complementation in Abstract Interpretation. *ACM-TOPLAS* 19(1):7–47, 1997.
2. R. Giacobazzi, C. Palamidessi, and F. Ranzato. Weak Relative Pseudo-Complements of Closure Operators. *Algebra Universalis* 36(3):405–412, 1996.
3. F.S. de Boer, A. Di Pierro, and C. Palamidessi. Infinite computations in nondeterministic constraint programming. *Theoretical Computer Science* 151(1):37–78, 1995.
4. A. Di Pierro, M. Martelli, and C. Palamidessi. Negation as Instantiation. *Information and Computation* 120(2):263–278, 1995.
5. F.S. de Boer and C. Palamidessi. Embedding as a Tool for Language Comparison. *Information and Computation*. 108(1):128–157, 1994.

Recent Collaborators, Advisees, and Students.

Collaborators in the past four years: E. Best (Oldenburg Univ, DE), F.S. de Boer (Utrecht Univ, NL), A. Cortesi (Padova Univ. IT), M. Falaschi (Udine Univ, IT), G. Filé (Padova Univ. IT), M. Gabbrielli (Pisa Univ, IT), R. Giacobazzi (Pisa Univ, IT), G. Levi (Pisa Univ, IT), K. Marriott (Melbourne Univ, AU), E. Marchiori (CWI, NL), M. Martelli (Genova Univ, IT), R. McDowell (Upenn, USA), D. Miller (Penn State, USA), F. Ranzato (Padova Univ. IT),

Post doc sponsored in the last five years: Julian Rathke (Sussex Univ, UK), Ernesto Pimentel (Malaga Univ, SP).

PhD Students supervised in the last five years: A. di Pierro (City Univ, UK), A. Messori (Genova Univ, IT).

External Advisor of Graduate Students in the last five years: N. Busi (Siena Univ, IT), S.-O. Nyström (Uppsala Univ, SE), R. Pugliese (Roma Univ, IT), W.J. Fokkink (Amsterdam Univ, NL), F. Rossi (Pisa Univ, IT), M. Belmesk (CNRS, FR), S. Bonnier (Linköping Univ, SE).