

# Radhakrishnan Jagadeesan

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## Education

Cornell University, Ph.D. in Computer Science, August 1991. Supervisor: Prakash Panangaden

Indian Institute of Technology, Kanpur, India. B. Tech in Computer Science, May 1987.

## Professional experience

Professor, DePaul University. Fall 2003 to present.

Professor, Loyola University, Fall 2003.

Associate Professor (with tenure) at Loyola University Chicago, Fall 1997 to Fall 2003.

Assistant Professor at Loyola University, Chicago, Fall 1993 to Fall 1997.

Postdoctoral Research Associate at Imperial College, London, Fall 1991 to Fall 1993, Supervisor: Samson Abramsky.

## External Professional Service (2000- )

- PC Member, Foundations of Software Structures and Computer Science, part of the ETAPS Conferences, 2013
- PC Member, Asian Symposium on Programming Languages and Systems, 2011.
- PC Member, Foundations of Software Technology and Theoretical Computer Science, 2011.
- PC Member, International Conference on Automata, Languages and Programming, 2011.
- PC Member, European Symposium on Programming, 2011.
- Panelist, NSF Medium Size Grants SEL Panelist, Dec 2010.
- Member (one of three), Logic In Computer Science, 2011 TestOfTime Award Committee
- PC member, 7<sup>th</sup> IEEE International Conference on Quantitative Evaluation of Systems. 2010.
- Panelist, NSF Cybertrust Panelist, 2009.
- Invited Speaker. “From Authorization Logics to Types for Authorization”. The Sixth Asian Symposium on Programming Languages and Systems, 2008.
- PC member, IEEE symposium on Logic in Computer Science,

2009. Co-Editor for Special Issue of Logical Methods in Computer Science devoted to the best papers.

- PC Member, Foundations of Software Structures and Computer Science, part of the ETAPS Conferences, 2009
- PC Member, International Conference on Concurrency Theory, 2008.
- PC Member, Foundations of Software Structures and Computer Science, part of the ETAPS Conferences, 2008.
- PC Member, International Conference on Automata, Languages and Programming—Track B, 2008.
- PC Member. 5<sup>th</sup> IEEE International Conference on Quantitative Evaluation of Systems. 2008.
- Panelist, NSF Cybertrust, 2007.
- Invited Speaker. “Formal Foundations for Aspects”. Foundations of Software Structures and Computer Science, part of the ETAPS Conferences, 2007.
- PC Member. 4<sup>th</sup> IEEE International Conference on Quantitative Evaluation of Systems. 2007.
- PC Member, International Conference on Concurrency Theory, 2007.
- PC member, IEEE symposium on Logic in Computer Science, 2006.
- PC member, Mathematical Foundations of Programming Semantics, 2006.
- PC Chair, Workshop on Games in Logic and Programming Languages, 2006. [colocated with Federated Logic Conference 2006]
- PC member, Foundations of Software Technology and Theoretical Computer Science, 2006.
- Proposal review, Software Engineering and Languages, NSF 2004.
- Invited speaker, session on Hybrid Systems, Mathematical Foundations of Programming Semantics, May 2004.
- Invited speaker, FOAL 2004, March 2004. Invitation extended jointly with Alan Jeffrey and James Riely. [James is giving the talk.]
- Program Committee Member, ASIAN 2003.
- Program Committee Member, Mathematical Foundations of Programming Semantics 2003.
- Proposal Review, Theory of Computation Program, NSF 2001.
- Program Committee Member, IEEE Symposium on Logic in Computer Science (LICS) 2001.
- Program Committee Member, Workshop on Probabilistic Methods in Verification, 2001
- Program Committee Member, International Conference on Concurrency Theory 2000.

- Panelist, Proposal review panel in Software Engineering and Languages Program, NSF 2000.
- Proposal Review, Theory of Computation Program, NSF 2000.
- Panelist, Proposal review panel in NSF Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) program, NSF 2000.

## Grants

- Project Director, NSF CCF-0915704 (Sep 2009 –Aug 2012). ``Language-based accountability''. \$499,970. Co-PI:C. Pitcher, J. Riely.
- Co-PI, NSF CCF-0916741 (Sep 2009 –Aug 2012). ``Language-based accountability''. \$499,520. Project Director: C. Pitcher. Co-PI:J. Riely
- Project Director, NSF, CCR- 0430175 (Aug 2004-Aug 2008), ``Temporal Aspects''. \$310,000. J. Riely(co-PI).
- PI, NSF, CCR- 0244901 (Sep 2002-Aug 2004), ``Approximate reasoning in stochastic concurrency: Applications to Secure Substitution and Stochastic hybrid systems''. \$75,000.
- PI, NSF, CCR-9901071 (Sep 1999 -Aug 2002). `The Triveni Project". \$ 155,000. (with V. Gupta, K. Laufer. )
- Project Person, Project Director: Dr. A. Scedrov. NSF Japan Program. 2000- 2002.
- PI, NSF CAREER Award, CCR-9501943 (Feb 95 -Aug 99). \$94,000. ``ATDCC -- a language for communicating reactive processes".
- Project Director, Sun Microsystems, Academic Equipment Grant, November 1999, \$ 89,500. (with C. Colby, P. Dordal, C. N. Sekharan and K. Laufer).
- Visiting Fellowship, UK Science and Engineering Council, Summer 1999.
- Office of Naval Research, 1994-1997.\$56,000
- Visiting Fellow, Isaac Newton Institute of Mathematical Sciences, Summer 1995.

## Selected Publications (in reverse chronological order)

1. Radha Jagadeesan, Corin Pitcher and James Riely. Non Interference for Intuitionist Necessity. Logic and Its Applications. 5<sup>th</sup> Indian Conference, ICLA 2013. Lecture Notes in Computer Science 7750, Springer. pp 185—197.
2. Radha Jagadeesan, Corin Pitcher and James Riely. Succour to the confused deputy: Types for Capabilities. 10th Asian Symposium on Programming Languages and Systems, 2012. Lecture Notes in Computer Science 7705, Springer. pp 66—81.
3. Radha Jagadeesan, Gustavo Petri and James Riely. Brookes Is Relaxed, Almost! Foundations of Software Science and Computational

Structures - 15th International Conference, FOSSACS 2012, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2012. [Lecture Notes in Computer Science](#) 7213 Springer 2012. pp 180—194.

4. Matthew Goto, Radha Jagadeesan, Corin Pitcher and James Riely. Types for relaxed memory models. The Seventh ACM SIGPLAN Workshop on Types in Languages Design and Implementation, Philadelphia, PA, USA, Saturday, January 28, 2012. ACM 2012. pp 25-38.
5. Radha Jagadeesan, Corin Pitcher, Julian Rathke and James Riely. Local Memory via Layout Randomization. In *CSF'11. 24th IEEE Computer Security Foundations Symposium*. 2011.
6. [Weak bisimulation is sound and complete for PCTL\\*](#). In *Information and Computation*, vol. 208, pp. 203-219, 2010; doi:10.1016/j.ic.2009.11.002.  
  
Preliminary version In *the Proceedings of the International Conference on Concurrency Theory, August 2002*. (with J. Desharnais and V. Gupta and P. Panangaden. )
7. Generative Operational Semantics for Relaxed Memory Models. (with C. Pitcher and J. Riely). In the Proceedings of the 2010 European Symposium on Programming. *Lecture Notes in Computer Science* 6012, Springer, pp 307-326.
8. Towards a theory of accountability and audit. (with A. Jeffrey, C. Pitcher and J. Riely) In the Proceedings of the 14<sup>th</sup> European Symposium on Research in Computer Security, *Lecture Notes in Computer Science* 5789, Springer, pp 152-167.
9. [Open Bisimulation for Aspects](#). In the Transactions on Aspect Oriented System Development V. *Lecture Notes in Computer Science* 5490, pp. 72-132, Springer.  
  
Preliminary version in *Proc. ACM Sixth International Conference on Aspect-Oriented Software Development (AOSD '07)*. (with C. Pitcher and J. Riely). pp 107-120.
10. Game semantics for Access control. (with Samson Abramsky). *Proc. of the Mathematical Foundations of Programming Semantics, 2009*. *Electronic Notes in Theoretical Computer Science*, vol 249.
11. TAPIDO: Trust and Authorization via Provenance and Integrity in Distributed Objects. (with A. Cirillo, J. Riely and C. Pitcher). In the proceedings of the European Symposium on Programming (part of European Theory and Practice of Software). *Lecture Notes in Computer Science*, Vol 4960, pp 208-223.
12. Editor, Special Issue of Logical Methods in Computer Science for LICS 2006.
13. Do As I SAy! Programmatic Access Control with Explicit

- Identities. (with A. Cirillo, J. Riely and C. Pitcher). In IEEE Computer Security Foundations, 2007.
14. Specifications of a high-level conflict-free firewall policy language for multi-domain networks. (with B. Zhang, E. Al Shaer, J. Riely and C. Pitcher)
  15. [A Theory of Memory Models](#). In Proceedings of ACM SIGPLAN 2007 Symposium on Principles and Practice of Parallel Programming. (with V. A. Saraswat, M. Michael and C. von Praun). Pp 161-172.
  16. [Games for Controls](#). In IEEE [Computer Security Foundations Workshop](#), 2006. (with K. Chatterjee and C. Pitcher)
  17. [Typed Parametric Polymorphism for Aspects](#). In the [Science of Computer Programming](#), 63(3), pp. 267-296. 2006. (with with A. Jeffrey and J.Riely).
  18. [Lambda-RBAC: Programmatic Role-Based Access Control](#) . In International Conference on Automata, Languages and Programming, Lecture Notes in Computer Science 4052, July 2006. (with A. Jeffrey, C. Pitcher and J.Riely). **Logical Methods in Computer Science. Volumer 4(1). Jan 2008.**
  19. Concurrent Clustered Programming. Proceedings of the 16th International Conference on Concurrency Theory. Lecture Notes in Computer Science 3653, pp 353-367 (with Vijay A. Saraswat).
  20. Testing Concurrent Systems: An Interpretation of Intuitionistic Logic. Proceedings of the 25th International Conference on Foundations of Software Technology and Theoretical Computer Science, 2005. [Lecture Notes in Computer Science](#) 3821 Springer. pp 517-528 (with Gopalan Nadathur and Vijay A. Saraswat)
  21. Timed constraint programming: a declarative approach to usage control. Proceedings of the 7th International ACM SIGPLAN Conference on Principles and Practice of Declarative Programming, 2005. ACM 2005. pp 164-175 (with C. Pitcher and W. Marrero)
  22. mu-ABC: [A minimal calculus for aspect-oriented programs](#). CONCUR 2004 - Concurrency Theory, 15th International Conference, London, UK, August 31 - September 3, 2004, Proceedings. [Lecture Notes in Computer Science](#) 3170 Springer 2004. pp 209-224. (with Glenn Bruns, Alan Jeffrey and James Riely).
  23. [Approximate reasoning for real-time probabilistic processes](#). 1st International Conference on Quantitative Evaluation of Systems (QEST 2004), 27-30 September 2004, Enschede, The Netherlands. IEEE Computer Society 2004. pp 304-313. (with V. Gupta, P. Panangaden).
  24. [Three-Valued Abstractions of Games: Uncertainty, but with Precision](#). n LICS 04: Proceedings of 19th IEEE Symposium on Logic in Computer Science, 2004. (with L.de Alfaro and P. Godefroid).
  25. [Metrics for labeled Markov processes](#). . [Theor. Comput. Sci.](#) **318**(3): 323-354 (2004) . Preliminary version in *the Proceedings of the International Conference on Concurrency theory 1999*,

- Lecture Notes in Computer Science, Vol 1664 (with J. Desharnais, V. Gupta, P. Panangaden).
26. Co-Editor. LICS 2001 special issue. ACM Transactions on Computational Logic. 4(3): 295 (2003) (with Erich Grädel, A. Piperno and Joseph Y. Halpern).
  27. [jcc: Integrating Timed Default Concurrent Constraint Programming](#) into Java. EPIA, Lecture Notes in Computer Science 2902, December 2003 (with Vijay A. Saraswat and Vineet Gupta).
  28. [An untyped calculus of aspect-oriented programs](#). In the European Conference on Object Oriented Programming, Lecture Notes in Computer Science 2743, July 2003. (with A. Jeffrey and J. Riely).
  29. [Modal Transition Systems: A foundation for three-valued program analysis](#). Accepted for publication in Mathematical Structures in Computer Science in Jan 2003. Preliminary version in the *European Symposium on Programming*, April 2001. Lecture Notes in Computer Science, Vol. 2028 (with M. Huth, D. Schmidt).
  30. [Approximating labeled Markov processes](#). Information and Computation. 184(1): 160-200. Preliminary version in *the Proceedings of the IEEE Conference on Logic in Computer Science, June 2000* (with J. Desharnais, V. Gupta, P. Panangaden).
  31. [Game semantics for generic polymorphism](#). Proceedings of FOSSACS, Lecture Notes in Computer Science 2620, Jan 2003. Accepted for publication in the Annals of Pure and Applied Logic. (with Samson Abramsky).
  32. [On The Expressiveness of 3-Valued Models](#). Proceedings of VMCAI'2003 (4th Conference on Verification, Model Checking and Abstract Interpretation), New York, January 2003. Lecture Notes in Computer Science, vol. 2575, pages, 206-222, Springer-Verlag. (with Patrice Godefroid)
  33. [The Metric analogue of weak bisimulation for probabilistic processes](#). In *the Proceedings of the IEEE Conference on Logic in Computer Science, July 2002*. (with J. Desharnais and V. Gupta and P. Panangaden).
  34. [Automatic Abstraction Using Generalized Model Checking](#). In the Proceedings of the 14<sup>th</sup> International conference on Computer Aided Verification, July 2002. Lecture Notes in Computer Science, Vol. 2044. (with Patrice Godefroid)
  35. [Abstraction-based Model Checking using Modal Transition Systems](#). In the *International Conference on Concurrency Theory*, August 2001. Lecture Notes in Computer Science, Vol 2154 (with P. Godefroid, M. Huth).

36. [Automated Systematic Testing for Constraint-Based Interactive Services](#). In the Proceedings of Foundations of Software Engineering, San Diego, CA, November 2000 (with P Godefroid, L. J Jagadeesan, K. Läufer).
37. [Sisl: several interfaces, single logic](#). 3 (2):91-106, International Journal of Speech Technology, June 2000 (with T. Ball, C. Colby, P. Danielsen, Lalita J. Jagadeesan, R. Jagadeesan, K. Läufer, P. Mataga, and K. Rehor).
38. [A constraint based framework for prototyping distributed virtual applications](#). In the Proceedings of Constraint Programming, October 2000. *Lecture notes in Computer Science, Vol 1894* (with V. Gupta, L. J. Jagadeesan, X. Jiang, K. Läufer).
39. [Games and Full Abstraction for PCF](#). In *the proceedings of the International Symposium on Theoretical Aspects of Computer Software* , Lecture Notes in Computer Science, Vol. 789. Information and Computation. 163(2), 409-470, 2000 (with S. Abramsky, P. Malacaria)
40. [Stochastic programs as concurrent constraint programs](#) . In the 1999 *ACM Symposium on Principles of Programming languages* (with V. Gupta, P. Panangaden).
41. [Objects and Processes in Triveni: A case study from telecommunications in Java](#). Proceedings of the 1998 USENIX Conference on Object Oriented Technologies and Systems. Usenix publications (with C. Colby, L. J. Jagadeesan, K. Laufer, C. Puchol).
42. [Design and Implementation of Triveni - A process algebraic API for threads + events](#). Proceedings of the 1998 IEEE International Conference on Computer Languages. IEEE Press (with C. Colby, L. J. Jagadeesan, K. Laufer, C. Puchol).
43. [Computing with continuous change](#). In *the Science of Computer Programming* , 30(1,2) 3-49, 1998 ( with V. Gupta, V. A. Saraswat).
44. [Probabilistic concurrent constraint programming](#). In *the Proceedings of the the International Conference on Concurrency theory* , Lecture Notes in Computer Science, Vol. 1243, October 1997 ( with V. Gupta, V. A. Saraswat).
45. [Robust timed automata](#). In *proceedings of the Hybrid and Real time systems workshop* , Lecture notes in Computer Science, Hybrid Systems III, Vol 1201, 1997. ( with V. Gupta, T. Henzinger).
46. [Truly concurrent constraint programming](#). In *the Proceedings of the International Conference on Concurrency theory* , Lecture Notes in Computer Science, Vol. 1119, October 1996 ( with V.

Gupta, V. A. Saraswat).

47. [Models of concurrent constraint programming](#). In *the Proceedings of the International Conference on Concurrency theory*, Lecture Notes in Computer Science, Vol. 1119, October 1996 ( with V. Gupta, V. A. Saraswat).
48. [Timed Default concurrent constraint programming](#). In *Journal of Symbolic computation*, 22(5,6) 475-520, 1996, Preliminary version appeared in the Proceedings of the 22nd Annual ACM SIGPLAN-SIGACT Symposium on the Principles of Programming Languages, January 1995 ( with V. Gupta, V. A. Saraswat).
49. [Hybrid cc, Hybrid automata and Program verification](#). In *proceedings of the DIMACS/ SYCON workshop on Verification and Control of Hybrid systems*, Lecture notes in Computer Science, Hybrid Systems III, Vol 1068 ( with V. Gupta, V. A. Saraswat).
50. [Causality and True Concurrency: A Dataflow Analysis of the Pi-Calculus](#). In *Proceedings of the 4th International Conference on Algebraic Methodology and Software Technology*, Lecture Notes in Computer Science, Vol. 936, July 1995 (with L. J. Jagadeesan).
51. [Games and Full Completeness for Multiplicative Linear Logic](#). In *Journal of Symbolic Logic*, 59(2): 543-574. June 1994. Preliminary version appeared in the Proceedings of the Conference on Foundations of Software Technology and Theoretical Computer Science, December 1992 (with S. Abramsky)
52. [New foundations for the Geometry of Interaction](#). In *Information and Computation*, 111(1):53-119, May 1994. Preliminary version appeared in the Proceedings of the 7th Annual IEEE Symposium on Logic in Computer Science, June 1992 (with S. Abramsky)
53. [Foundations of timed concurrent constraint programming](#). In the proceedings of the *9th Annual IEEE Symposium on Logic in Computer Science*, July 1994 ( with V. Gupta, V. A. Saraswat).
54. [Programming in Timed concurrent constraint Language](#). In *Constraint Programming*, NATO Advanced Science Institute Series, Series F: Computer and System Sciences, Vol 131, edited by B Mayoh, E Tougu and J Penjam, Chapter 4, 1994 ( with V. Gupta, V. A. Saraswat).
55. [Programming in Hybrid concurrent constraint Language](#). In proceedings of *Hybrid systems*, Lecture notes in Computer Science, Hybrid Systems II, Vol. 999 ( with D. G. Bobrow, V. Gupta, V. A. Saraswat).
56. [A Domain-theoretic Model for a Higher-order Process Calculus](#).



In proceedings of the *17th International Colloquium on Automata, Languages and Programming* , Lecture Notes in Computer Science, Vol. Vol. 443, July 1990 (with P. Panangaden).

57. [A fully abstract semantics for a first order functional language with logic variables.](#) In *ACM Transactions on Programming Languages and Systems* , 13(4): 577-625, October 1991. Preliminary version appeared in the Proceedings of the 4th Annual IEEE Symposium on Logic in Computer Science, 294-303, June 1989 (with P. Panangaden, K. Pingali).
58. [Abstract semantics for a higher order functional language with logic variables.](#) In the proceedings of the *19th Annual ACM SIGPLAN-SIGACT Symposium on the Principles of Programming Languages* , January 1992 (with K. Pingali).
59. [L-Domains and Lossless Powerdomains.](#) In proceedings of the *5th Conference on Mathematical Foundations of Programming Semantics* , March 1989, Lecture Notes in Computer Science, Vol. 439.

## References

On request.