Curriculum Vitæ
Anindya Banejee

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http://anindyabanerjee.net

My research interests span software security, software verification, probabilistic programming, semantics and logics of programs, abstract interpretation, program analysis and program transformation.

Research Objectives

My goal is to improve the reliability of software by providing machine-checkable warranties of their intended behaviors. My primary research activities concern the development of theories, tools and experiments that embody principles of reasoning about sequential, concurrent, networked and distributed software.

Current Employment

Program Director, National Science Foundation July 2013 – present
Division of Computing and Communication Foundations (CCF)
Directorate of Computer and Information Sciences Engineering (CISE)

Program Assignments

- Software and Hardware Foundations; Exploiting Parallelism for Scalability; Cyberphysical Systems; Research Experience for Undergraduates; CISE Research Initiation Initiatives.

Core duties for program management of all programs

- Regularly meet and advise prospective PIs through outreach at leading conferences, academic visits. Organize panels while paying special attention to expertise of panelists and diversity of panel. Lead panels, paying attention to fairness of process, take notes and provide critical follow-up. Write post-panel analyses of proposal reviews and panel summaries based on panel notes. Articulate funding recommendations to CCF Division Director, paying attention to portfolio balance and availability of funds. Negotiate award budget as needed. Write award abstract for general public, articulating a funded project's intellectual merits and broader significance and importance. Approve (post-award) annual reports, while ensuring that project is on track to meet its goals. Ensure that collaboration between PIs is on track as required in collaborative projects.

Program Specific Duties

- *Software and Hardware Foundations* (SHF): In addition to core duties, update SHF program solicitation (NSF 14-598) to incorporate research topics on novel synergies and integrations between programming languages and other areas of computing.
- *Exploiting Parallelism and Scalability (XPS)*: In addition to core duties, **manage** XPS program. Involves updating XPS program solicitation (NSF 15-511) to reflect new research directions and priorities, based upon community input and inputs from participating Program Directors from all CISE divisions (CCF, CNS, ACI, IIS). Lead proposal sorting and manage overall set up of XPS panels. Create and manage overall program spending plan, negotiate budgets for different sub-areas with individual program directors.

Other Organizational Activities

- XPS PI meeting: Select PIs to chair XPS PI meeting, and support the meeting through an NSF award. Coordinate logistics for the XPS PI meeting: dates (June 1--2, 2015); set specific deadlines for obtaining confirmation on meeting venue and hotel accommodations. Coordinate, through regular conversations with the chairs, overall structure of the meeting program: talks, breakout sessions, plenary sessions.
- Monitor NSF Expeditions site (funded by NSF Expeditions in Computing program): Monitor technical progress through phone calls with lead PI, progress reports, visits to annual project meetings. Organize reverse site visits. Organize evaluation committees for independent evaluation of the site.
- Chair sessions and facilitate breakout discussions in CPS PI meetings.
- Chair sessions and facilitate discussions with prospective PIs in NSF CAREER writing workshop.

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Academic Appointments

Full Professor with tenure (On leave) February 2009—present
Madrid Institute for Advanced Studies in Software Technologies *(IMDEA Software Institute)* Madrid, Spain
Full Professor July 2007 -- January 2009
Associate Professor (*with tenure since July 2003*) July 2001 -- June 2007
Kansas State University, Manhattan, Kansas, USA.
Visiting Researcher, Programming Languages and Methodology Group September 2007 -- June 2008
Microsoft Research, Redmond, Washington, USA. *(Sabbatical leave from Kansas State University)*
Academic Visitor, Advanced Programming Tools Group May 2007 -- August 2007
IBM T. J. Watson Research Center, Hawthorne, New York, USA.
Visiting Fellow August 2002
Queen Mary University of London, UK
Collaborative research with Peter O'Hearn, David Naumann and Hongseok Yang on EPSRC grant GR/S03539, "Abstraction, Confinement and Heap Storage''
Assistant Professor September 1997 - July 2001
Stevens Institute of Technology, Hoboken, New Jersey, USA
Research and Development Scientist December 1996 -- June 1997
Xinotech Research Inc., Minneapolis, Minnesota, USA.
Co-Principal Investigator in the DARPA-funded Evolutionary Design of Complex Systems.
Forskningsadjunkt (Research Assistant Professor; postdoctoral position) July 1996 -- November 1996
University of Aarhus, Aarhus, Denmark
Supervisor: Prof. Flemming Nielson.
Chargé de Recherche (Postdoctoral fellow) October 1995 -- June 1996
Laboratoire d'Informatique, Ecole Polytechnique, Paris, France
Supervisor: Dr. Radhia Cousot.
Visiting Researcher April 1996
The Computer Laboratory, University of Cambridge, England.
Research Assistant 1992-1993
Department of Computing and Information Sciences, Kansas State University, Manhattan, Kansas, USA
Visiting summer intern Summer 1992
Equipe LSP, INRIA Rennes, France
Supervisor: Dr. Pascal Fradet

Education

Ph.D., Computing and Information Sciences, July 1995. Kansas State University, Manhattan, Kansas, USA.
Dissertation: *The Semantics and Implementation of Bindings in Higher-Order Programming Languages*.
Supervisors: Prof. David A. Schmidt and Prof. Olivier Danvy.

M.S., Computer and Information Sciences, May 1989. University of Delaware, Newark, Delaware, USA.

B.C.S.E., Computer Science and Engineering, July 1987. Jadavpur University, Calcutta, India.

Diplôme de la langue Française, January 1987. Alliance Française, Calcutta, India.

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Research Grants (U.S.A.)

National Science Foundation Cyber Trust program, 2006--2010. Principal Investigator.
Award total: $400,000, Kansas State portion: $200,000.
Access Control and Downgrading in Information Flow Assurance.
Collaborative award with David A. Naumann at Stevens Institute of Technology

Air Force Office of Scientific Research, 2006--2009.
Award total: $450,000.
An Integrated Specification and Verification Environment for Component-Based Architectures of Large-Scale Distributed Systems.
Co-PI with John Hatcliff (PI) and Torben Amtoft (Co-PI).

National Science Foundation ITR program, 2003--2007.
Award total: $900,000, Kansas State portion: $135,000.
Language-based Software Security.
Sub-contract Co-PI with David A. Schmidt (Kansas State University), Alexander Aiken (Stanford University), Rastislav Bodik (Univ. of California, Berkeley), Thomas A. Henzinger (Univ. of California, Berkeley), George C. Necula (Univ. of California, Berkeley) and David A. Wagner (Univ. of California, Berkeley).

National Science Foundation Trusted Computing program, 2002--2005. Principal Investigator.
Award total: $297,000, Kansas State portion: $137,464.
Integrating Pointer Confinement and Access Control for Encapsulation.
Collaborative award with David A. Naumann at Stevens Institute of Technology.

National Science Foundation Faculty Early Career Development Award [CAREER]
Software Engineering and Languages program, **2001-2006. Principal Investigator**.
Award total: $325,000.
CAREER: *Type Systems and Program Analyses for Secure and Reliable Interactive Web Services.*

Bell Laboratories, Lucent Technologies grant on Automated Security Analysis of Computer Programs, **2000. Principal Investigator**.
Award total: $70,000. Collaborators: Nevin Heintze and Jon G. Riecke. Postdoctoral fellow: François Pessaux.

National Science Foundation, Experimental and Integrated Activities Program, 1998 -- 2001.
Award total: $979,794, Stevens Institute portion: $194,136.
Collaborative Research: Applications of Flow Types in the Efficient, Modular and Reliable Compilation of Higher-Order Typed Languages.
Co-PI with Assaf Kfoury (Boston University, PI), Robert Muller (Boston College), Franklyn Turbak (Wellesley College), Joe Wells (Herriot-Watt University, Scotland).

Research Grants (Europe)

Spain:

- Spanish Science and Innovation Ministry Project TIN2012-39391-C04-01 STRONGSOFT: Sound Technologies for Reliable, Open, New Generation Software, 2013--2015. Award total: €100,000.
- European Union Network of Excellence grant, NoE-25980 NESSOS, 2010 -- 2014. Award total: €332,834.
- Madrid Regional Government Project S2009TIC-1465 PROMETIDOS, 2010--2013. Award total: €293,526.84.

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- Madrid Regional Government Project TIN2009-14599-C03-02 DESAFIOS, 2010--2012. Award total: €308.187

United Kingdom:

- EPSRC (Engineering and Physical Sciences Research Council, United Kingdom, Visiting Fellowship, 2002. Award total: £8850.
  Abstraction, Confinement and Heap Storage
  Co-PI with David A. Naumann, Peter O'Hearn (PI) and Hongseok Yang. Received final evaluation of **Outstanding** awarded to 10% of EPSRC grants.

Publications

Book Chapters

1. A. Banerjee and D. A. Naumann: State Based Encapsulation for Modular Reasoning about Behavior-Preserving Refactorings. In **Aliasing in Object Oriented Programs**, Springer State-of-the-Art Surveys, Lecture Notes in Computer Science, Vol. 7850, pp. 319--365, 2013.
2. B. Livshits, A. Nori, S. Rajamani and A. Banerjee: Merlin: Specification Inference for Explicit Information Flow Problems. In **Mining Software Specifications: Methodologies and Applications**, Chapman Hall/CRC Data Mining and Knowledge Discovery Series, ISBN: 9781439806265. April 2011.

Journal publications

3. A. Malkis and A. Banerjee: On Automation in the Verification of Software Barriers: Experience Report. **Journal of Automated Reasoning (JAR)** 52(3), pp. 275--329, March 2014.
4. A. Nanevski, A. Banerjee and D. Garg: Dependent Type Theory for Verification of Information Flow and Access Control Policies. **ACM Transactions on Programming Languages and Systems (TOPLAS)** 35(2), article 6, July 2013. ACM Computing reviews **Notable Article** of 2013. http://computingreviews.com/recommend/bestof/notableitems_2013.cfm
5. A. Banerjee, D. A. Naumann and S. Rosenberg: Local Reasoning for Global Invariants, Part I: Region Logic. **Journal of the ACM (JACM)** 60(3), article 18, June 2013.
6. A. Banerjee and D. A. Naumann: Local Reasoning for Global Invariants, Part II: Dynamic Boundaries. **Journal of the ACM (JACM)** 60(3), article 19, June 2013.
7. I. Mastroeni and A. Banerjee: Modelling Declassification Policies using Abstract Domain Completeness. **Mathematical Structures in Computer Science (MSCS)** 21(6), pp. 1253--1299, December 2011.
8. V. P. Ranganath, T. Amtoft, A. Banerjee, M. B. Dwyer and J. Hatcliff: A New Foundation for Control-Dependence and Slicing for Modern Program Structures. **ACM Transactions on Programming Languages and Systems (TOPLAS)** 29(5), August 2007. **Invited paper**, special issue for selected papers of European Symposium on Programming (ESOP 2005).
9. T. Amtoft and A. Banerjee: A Logic for Information Flow Analysis with an Application to Forward Slicing of Simple Imperative Programs. **Science of Computer Programming (SCP)** 64(1), pp. 3--28, January 2007. **Invited paper**, special issue for selected papers of Static Analysis Symposium (SAS 2004).
10. A. Banerjee and D. A. Naumann: Ownership Confinement Ensures Representation Independence for Object-Oriented Programs. **Journal of the ACM (JACM)** 52(6), pp. 894--960, November 2005. **Reviewed by Simon Thompson in Computing Reviews, February 23, 2006.**
11. A. Banerjee and D. A. Naumann: Stack-based Access Control and Secure Information Flow. **Journal of Functional Programming (JFP)** 15(2). **Invited paper**, special issue on Language-based Security, pp. 131--177, March 2005.
12. A. Banerjee and T. Jensen: Modular Control-flow Analysis with Rank 2 Intersection Types. **Mathematical Structures in Computer Science (MSCS)** 13(1), pp. 87--124, February 2003.

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13. A. Banerjee and D. A. Schmidt: Stackability in the Simply-Typed Call-By-Value Lambda Calculus. **Science of Computer Programming (SCP)** 30(1), May 1998. **Invited paper**, special issue for selected papers of Static Analysis Symposium (SAS 1994).

Conference and Workshop Publications

14. I. Sergey, A. Nanevski and A. Banerjee: Mechanized Verification of Fine-grained Concurrent Programs. In *36th ACM SIGPLAN International Conference on Programming Language Deign and Implementation (PLDI)*, June 2015. To appear. **Acceptance rate: 19%** .
15. I. Sergey, A. Nanevski and A. Banerjee: Specifying and Verifying Fine-Grained Concurrent Algorithms with Histories and Subjectivity. In *24th European Symposium on Programming (ESOP)*, April 2015. To appear. **Acceptance rate: 28%.**
16. A. Banerjee and D. A. Naumann: A Logical Analysis of Framing for Specifications with Pure Method Calls. In *6th Working Conference on Verified Software: Theories, Tools and Experiments (VSTTE)*, Lecture Notes in Computer Science, Vol. 8471, pp. 3--20, July 2014. Springer-Verlag.
17. S. Itzhaky, A. Banerjee, N. Immerman, O. Lahav, A. Nanevski and M. Sagiv: Modular Reasoning about Heap Paths via Effectively Propositional Formulas. In *41st Annual ACM Symposium on Principles of Programming Languages (POPL)*, pp. 385--396, Jan. 2014. **Acceptance rate: 23%.**
18. A. Banerjee and D. A. Naumann: A Simple Semantics and Static Analysis for Stack Inspection. In Semantics, Abstract Interpretation and Reasoning about Programs: Essays Dedicated to David. A. Schmidt on the Occasion of his Sixtieth Birthday, *Electronic Proceedings in Theoretical Computer Science (EPTCS)* Vol. 129, pp. 284--308, Sept. 2013.
19. G. Stewart, A. Banerjee and A. Nanevski: Dependent Types for Enforcement of Information Flow and Erasure Policies in Heterogeneous Data Structures. In *15th International Conference on Principles and Practice of Declarative Programming (PPDP)*, pp. 145--156, Sept. 2013.
20. S. Itzhaky, A. Banerjee, N. Immerman, A. Nanevski, M. Sagiv: Effectively-Propositional Reasoning about Reachability in Linked Data Structures. In *25th International Conference on Computer Aided Verification (CAV)*, Lecture Notes in Computer Science, Vol. 8044, pp. 756--772, July 2013. **Acceptance rate: 25%.**
21. M. Marron, O. Lhoták and A. Banerjee: Programming Paradigm Driven Heap Analysis. In *21st International Conference on Compiler Construction (CC)*, Lecture Notes in Computer Science, Vol. 7210, pp. 41--60, March 2012.
22. A. Malkis and A. Banerjee: Verification of Software Barriers. In *17th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)* (poster paper), pp. 313--314, February 2012.
23. S. Rosenberg, A. Banerjee and D. A. Naumann: Decision Procedures for Region Logic. In *13th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI)*, Lecture Notes in Computer Science, Vol. 7148, pp. 379--395, January 2012.
24. A. Nanevski, A. Banerjee and D. Garg: Verification of Information Flow and Access Control Policies with Dependent Types. In *32nd Annual IEEE Symposium on Security and Privacy (S&P)*, pp. 165--179, May 2011. IEEE Computer Society Press. **Acceptance rate: 11%.**
25. S. Rosenberg, A. Banerjee and D. A. Naumann: Local Reasoning and Dynamic Framing for the Composite Pattern with Clients. In *3rd International Conference on Verified Software: Tools, Theories and Experiments (VSTTE)*, Springer State-of-the-Art Surveys, Lecture Notes in Computer Science, Vol. 6217, pp. 183--198, August 2010. Springer-Verlag.
26. D. A. Naumann and A. Banerjee: Dynamic Boundaries: Information Hiding by Second Order Framing with First Order Assertions. **Invited paper**, *19th European Symposium on Programming (ESOP)*, Lecture Notes in Computer Science, Vol. 6012, pp. 2--22. Springer Verlag.
27. B. Livshits, A. Nori, S. Rajamani and A. Banerjee: Merlin: Specification Inference for Explicit Information Flow Problems. In *ACM SIGPLAN 2009 Conference on Programming Language Design and Languages (PLDI)*, pp. 75--86, Dublin, Ireland, June 2009. ACM Press. **Acceptance rate: 21%**.

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28. A. Shinnar, M. Pistoia and A. Banerjee: A Language for Information Flow: Dynamic Tracking in Multiple Interdependent Dimensions (Short Paper). In *2009 ACM SIGPLAN Workshop on Programming Languages and Analysis for Security (PLAS)*, pp. 125--131, Jun. 2009.
29. A. Banerjee, M. Barnett and D. A. Naumann: Boogie Meets Regions: a Verification Case Study. In *2nd IFIP Working Conference on Verified Software: Tools, Theories and Experiments (VSTTE)*, Lecture Notes in Computer Science, Vol. 5295, pp. 177--191, October 2008. Springer-Verlag.
30. A. Banerjee, D. A. Naumann and S. Rosenberg: Regional Logic for Local Reasoning about Global Invariants. In *22nd European Conference on Object-oriented Programming (ECOOP)*, Lecture Notes in Computer Science, Vol. 5142, pp. 387--411, July 2008. Springer-Verlag. **Acceptance rate: 19.5%.**
31. A. Banerjee, D. A. Naumann and S. Rosenberg: Expressive Declassification Policies and Modular Static Enforcement. In *28th Annual IEEE Symposium on Security and Privacy (S&P)*, pp. 339--353, May 2008. IEEE Computer Society Press. **Acceptance rate: 11%**.
32. T. Amtoft and A. Banerjee: Verification Condition Generation for Conditional Information Flow. In *5th ACM Workshop on Formal Methods in Security Engineering (FMSE)*, pp. 2--11, November 2007. **Acceptance rate: 28.5%**.
33. A. Banerjee, D. A. Naumann and Stan Rosenberg: Towards a Logical Account of Declassification (Short Paper). In *2007 ACM SIGPLAN Workshop on Programming Languages and Analysis for Security (PLAS)*, pp. 61--65, Jun. 2007.
34. M. Pistoia, A. Banerjee and D. A. Naumann: Beyond stack inspection: A unified access-control and information-flow security model. In *27th Annual IEEE Symposium on Security and Privacy (S&P)*, pp. 149--163, May 2007. IEEE Computer Society Press. **Acceptance rate: 12%.**
35. A. Banerjee, R. Giacobazzi and I. Mastroeni: What you lose is what you leak: Information leakage in declassification policies. In *23rd Conference on the Mathematical Foundations of Programming Semantics (MFPS)*, Electronic Notes in Theoretical Computer Science, vol. 173, pp. 47--66, 2007, Elsevier.
36. G. Le Guernic, A. Banerjee, T. Jensen and D. A. Schmidt: Automaton-based Confidentiality Monitoring. In *11th Annual Asian Computing Science Conference (ASIAN)*, (focusing on Secure Software and Related Issues), Lecture Notes in Computer Science, Vol. 4435, pp. 75--89, Tokyo, Japan, Dec. 2006. **Acceptance rate: 23%.**
37. T. Amtoft, S. Bandhakavi and A. Banerjee: A Logic for Information Flow in Object-oriented Programs. In *33rd Annual ACM Symposium on Principles of Programming Languages (POPL)*, pp.91--102, Charleston, South Carolina, Jan. 2006. **Acceptance rate: 19.7%.**
38. A. Banerjee and D. A. Naumann: State Based Ownership, Reentrance and Encapsulation. In *19th European Conference on Object-oriented Programming (ECOOP)*, Lecture Notes in Computer Science, Vol. 3586, pp. 387--411, July 2005. Springer-Verlag. **Acceptance rate: 14%.**
39. V. P. Ranganath, T. Amtoft, A. Banerjee, M. B. Dwyer and J. Hatcliff: A New Foundation for Control-Dependence and Slicing for Modern Program Structures. In *European Symposium on Programming (ESOP)*, Lecture Notes in Computer Science, Vol. 3444, pp. 77--93, Edinburgh, Scotland, April 2005, Springer-Verlag. **Acceptance rate: 24.5%.**
40. T. Amtoft and A. Banerjee: Information flow analysis in logical form. In *11th International Static Analysis Symposium (SAS)*, Lecture Notes in Computer Science, Vol. 3148, pp. 100--115, Verona, Italy, 2004, Springer-Verlag.
41. Q. Sun, A. Banerjee and D. A. Naumann: Modular and constraint-based information flow inference for an object-oriented language. In *11th International Static Analysis Symposium (SAS)*, Lecture Notes in Computer Science, Vol. 3148, pp. 84--99, Verona, Italy, 2004, Springer-Verlag.
42. A. Banerjee and D. A. Naumann: History-based Access Control and Secure Information Flow. **Invited paper**, *Construction and Analysis of Safe, Secure and Interoperable Smart Cards (CASSIS 2004)*, Lecture Notes in Computer Science, Vol. 3362, pp. 27--48, Marseilles, France, 2005, Springer-Verlag.

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43. A. Banerjee and D. A. Naumann: Ownership: transfer, sharing, and encapsulation. In *ECOOP Workshop on Formal Techniques for Java-like Programs (FTfJP)*, July 2003.
44. A. Banerjee and D. A. Naumann: Using Access Control for Secure Information Flow in a Java-like Language. In *16th IEEE Computer Security Foundations Workshop (CSFW)*, pp. 155--169, June 2003. IEEE Computer Society Press. Acceptance rate: 24%.
45. A. Banerjee and D. A. Naumann: Secure Information Flow and Pointer Confinement in a Java-like language. In *15th IEEE Computer Security Foundations Workshop (CSFW)*, pp. 253--267, June 2002. IEEE Computer Society Press. **Acceptance rate: 27%.**
46. A. Banerjee and D. A. Naumann: Representation Independence, Confinement, and Access Control. In *29th Annual ACM Symposium on Principles of Programming-Languages (POPL)*, pp. 166--177, Portland, Oregon, Jan. 2002. **Acceptance rate: 21%.**
47. A. Banerjee, N. Heintze and J. G. Riecke: Design and Correctness of Program Transformations based on Control-flow Analysis. **Invited paper**, *International Symposium on Theoretical Aspects of Computer Software (TACS)*, Lecture Notes in Computer Science, Vol. 2215, pp. 420--447, Sendai, Japan, October 2001, Springer-Verlag.
48. A. Banerjee, N. Heintze and J. G. Riecke: Region Analysis and the Polymorphic Lambda Calculus. *Proceedings of the 14th International IEEE Conference on Logic in Computer Science (LICS)*, pp. 88--97, Trento, Italy, July 1999, IEEE Computer Society Press. **Acceptance rate: 26%**.
49. M. Abadi, A. Banerjee, N. Heintze and J. G. Riecke: A Core Calculus of Dependency. *Proceedings of the 26th Annual ACM Symposium on Principles of Programming Languages (POPL)*, pp. 147--160, San Antonio, Texas, Jan. 1999. **Acceptance rate: 17.6%.**
50. A. Banerjee: A Modular, Polyvariant, and Type-based Closure Analysis. *Proceedings of the 2nd ACM International Conference on Functional Programming (ICFP)*, pp. 1--10, Amsterdam, The Netherlands, Jun. 1997.
51. A. Banerjee and D. A. Schmidt: Stackability in the Simply-Typed Call-By-Value Lambda Calculus. In *Proceedings of the 1st International Static Analysis Symposium (SAS)*, Lecture Notes in Computer Science, Vol.864, pp. 136--151, Namur, Belgium, 1994, Springer-Verlag.
52. A. Banerjee and D. A. Schmidt: A Categorical Interpretation of Landin's Correspondence Principle. In *9th Conference on the Mathematical Foundations of Programming Semantics (MFPS)*, Lecture Notes in Computer Science, Vol.802, pp. 587--602, New Orleans, USA, 1994, Springer-Verlag.

Edited Proceedings/Seminar Reports

1. A. Banerjee, O. Danvy, K. G. Doh and J. Hatcliff: Semantics, Abstract Interpretation and Reasoning about Programs: Essays Dedicated to David A. Schmidt on the Occasion of his Sixtieth Birthday. Electronic Proceedings in Theoretical Computer Science, Vol. 129, 2013.
2. A. Banerjee and D. Garg: Proceedings of the 5th ACM SIGPLAN Workshop on Programming Languages and Analysis of Security (PLAS 2010). ISBN: 978-1-60558-827-8, ACM Press.
3. A. Banerjee: Eleventh Workshop on Formal Techniques for Java-like Programs. ACM Press, 2009.
4. E. Albert, A. Banerjee, S. Drossopoulou, M. Huisman, A. Igarashi, G. T. Leavens, P. Muller and T. Wrigstad: Formal Techniques for Java-Like Programs. Lecture Notes in Computer Science, Vol. 5475, pp. 70--76, 2009, Springer-Verlag.
5. A. Banerjee, H. Mantel, D. A. Naumann and A. Sabelfeld: Final Report for Dagstuhl Seminar 03411 on Language-based Security, November 2003.

Thesis

A. Banerjee: The Semantics and Implementation of Bindings in Higher-Order Programming Languages. *Ph.D. dissertation, Department of Computing and Information Sciences, Kansas State University, Manhattan, Kansas, USA, 1995.*

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Software Tools Projects

- RHTT (with Aleksandar Nanevski and Deepak Garg), 2010-- present. A tool, implemented in Coq, for interactive verification of access control and information flow security policies.
- VERL (with Stan Rosenberg and David A. Naumann), 2008--present. A verification tool for Region Logic built on top of an existing verification condition generator (Boogie) which serves as a front end to an SMT solver (Z3). The tool has been used for verification of linked data structures and design pattern (observer pattern, composite pattern) implementations.
- Automatic Verification of Software Barriers (with Alexander Malkis), 2010--2013. Code and experiments available at bar.net63.net.
- Automatic Verification of Linked Data Structures using SMT solvers(with Shachar Itzhaky, Neil Immerman, Aleks Nanevski, Mooly Sagiv), 2012--present.
- MERLIN (with Ben Livshits, Aditya Nori, Sriram Rajamani), 2008--2009. A tool for automatically inferring explicit information flow specifications from web programs based on modelling information flow paths in a data propagation graph using probabilistic constraints; constraint solving is based on factor graphs.
- SecJ (with Qi Sun and David A. Naumann), 2004--2007. A modular secure Information flow Inferencer for object-oriented programs.

Awards and Honours

- Invited Speaker, 40th International Symposium on Mathematical Foundations of Computer Sceience, Milan, Italy, August 2015.
- Distinguished Lecturer, School of Computing and Information Sciences Distinguished Lecture Series, Florida International University, Miami, Florida, December 2012.
- Distinguished Paper Award at the Twenty-second European Conference on Object-oriented programming (ECOOP'08), Paphos, Cyprus, for the paper *Regional Logic for Local Reasoning about Global Invariants* co-authored with David A. Naumann and Stan Rosenberg.
- Program Committee member of ACM Symposium on Principles of Programming Languages (POPL) 2009.
- Faculty Early Career Development Award, National Science Foundation, 2001-2006.
- Making a Difference Award, Women in Engineering and Sciences Program (WESP), Kansas State University, 2005.
- Distinguished Lecturer, School of Computer Sciences Colloquium, McGill University, Montreal, Canada, 2004.
- Best Paper Award at the Eleventh International Static Analysis Symposium (SAS'04), Verona, Italy, for the paper *Information Flow Analysis in Logical Form* co-authored with Torben Amtoft.
- Student participant, International Summer School on Programming Methodology, Marktoberdorf, Germany, 1990.

Teaching Activities

Kansas State University, Manhattan, Kansas, USA, 2001--2008.

- Logical Foundations of Computer Science (Fall 2001, Spring 2002)
- Programming Languages (2002--2008)
- Programming Language Design (Spring 2003)
- Language-based Security (Fall 2003, Fall 2004)
- Program Analysis (Spring 2005)
- Cybersecurity (Fall 2005)
- Logic-based Program Analysis and Verification (Fall 2006, Fall 2008)

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Stevens Institute of Technology, Hoboken, New Jersey, USA, 1997--2001.

- Elements of Compiler Design (Fall 1997, Fall 1999, Spring 2000),
- Advanced Compilers (Spring 1998), Computational Structures (Fall 2000),
- Algorithms and Advanced Data Structures (Fall 1998),
- Programming Languages (Fall 1998, Spring 1999, Spring 2001),
- Semantics of Programming Languages (Spring 2001).
- Responsible for designing the advanced compilers course and modernizing the elements of compiler design course. Responsible (jointly with D. A. Naumann) for designing the Computational Structures course.

University of Aarhus, Denmark, October 1996.

- Mini-course on Luca Cardelli's web language, Obliq.

Kansas State University, 1989-1995.

- Six terms of teaching experience as recitation instructor/teaching assistant. Courses include: Programming Languages (graduate and senior undergraduate), Theoretical Foundations of Computer Science (senior undergraduate), Data Structures and Analysis of Algorithms (senior undergraduate).

University of Delaware, 1987-1989.

- Two terms of teaching experience as recitation instructor/teaching assistant. Courses include: Introduction to Computer Science (beginning undergraduate), Logic and Programming (junior undergraduate), Analysis of Algorithms (beginning graduate).

Patents

- Method for Information Tracking in Multiple Interdependent Dimensions. US Patent 20090193492, 07-30-2009.

Editorial

- Member of Editorial Board, Foundations and Trends in Programming Languages, 2012 – present. Published by Now Publishers Inc., Boston. Editor-in-chief: Prof. Mooly Sagiv. https://www.nowpublishers.com/product.aspx?product=PGL
- Associate Editor, Journal of Higher-Order and Symbolic Computation, (nee Lisp and Symbolic Computation), 2009--2013. Published by Springer.
  Editors-in-chief: Prof. Olivier Danvy and Dr. Carolyn Talcott.
  http://www.springer.com/computer/theoretical+computer+science/journal/10990

Seminar/Conference/Workshop Organization and Research Presentations

Seminar/Conference/Workshop organization

- Organizer (with Deepak Garg), Workshop on Programming Languages and Analyses for Security (PLAS), Toronto, Canada, June 2010.
- Organizer, Workshop on Formal Techniques for Java-like Programs (FTfJP), Genova, Italy, July 2009.
- Organizing board member, Workshop on Programming Language Noninterference and Dependence (PLID), Verona, Italy, August 2004.
- Dagstuhl Seminar 03411 on Language-based Security, Schloss Dagstuhl, Germany, October 2003. (Co-organizer with Heiko Mantel (ETH, Zurich), David A. Naumann (Stevens Instt.) and Andrei Sabelfeld (Cornell University)). This was the first meeting of researchers in language-based security and was attended by 59 participants from 10 countries.

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- Organizer, New Jersey Programming Languages and Systems Seminar, NEC Research Institute, Princeton, September 1999.

Invited seminar participation

- Invited participant, Seminar on Quantitative Security Analysis, Schloss Dagstuhl, Germany, 2012.
- Invited participant, Seminar on Design and Validation of Concurrent Systems, Schloss Dagstuhl, Germany, 2009.
- Invited participant, Seminar on Typing, Analysis and Verification of Heap-Manipulating Programs, Schloss Dagstuhl, Germany, 2009.
- Invited participant, Seminar on Types, Logics, and Semantics for State, Schloss Dagstuhl, Germany, 2008.
- Invited participant, Seminar on Mobility, Ubiquity, Security, Schloss Dagstuhl, Germany, 2007.
- Invited participant, Seminar on Challenges of Software Verification, Schloss Dagstuhl, Germany, 2006.
- Invited Principal Investigator, National Science Foundation Annual Cybertrust Meeting, 2007, 2005.
- Invited participant, Microsoft Research Faculty Summit, 2005.
- Invited participant, National Science Foundation HCMDSS planning workshop, 2004.
- Invited participant, Construction and Analysis of Safe, Secure and Interoperable Smart Cards (CASSIS 2004), Marseilles, France, 2004.
- Invited Principal Investigator, National Science Foundation Cyber Trust Point Meeting, 2003.
- Invited participant, Seminar on Reasoning about Shape, Schloss Dagstuhl, Germany, 2003.
- Invited participant, Seminar on Model-Checking and Program Analysis, Schloss Ringberg, Germany, 2000.

Research presentations, Keynotes and Panels

- Modular Reasoning about Object-based Programs.
  Second International Conference on Formal Verification of Object-Oriented Software, Turin, Italy, October 2011.
- Expressive Information Flow Policies and their Modular Static Enforcement. Workshop on Formal Aspects in Security and Trust, Eindhoven, Netherlands, November 2009.
- Information Flow, Modularity, and Declassification. Workshop on Abstract Interpretation, Design and Applications (AIDA), Venice, Italy, July 2006.
- What Makes a Good PhD in Informatics? 8th European Computer Science Summit (ECSS), Barcelona (Nov. 2012)

Conferences and Seminars

- *Modular Reasoning for Behavior-Preserving Data Structure Refactorings*. Indiana University (Feb. 2015), Univ. of Massachusetts, Amherst, Boston University (Nov. 2014).
- *Towards Reliable Software*. Iowa State University (Apr. 2013), National Science Foundation (Feb. 2013).
- *Flexible Confidentiality Policies and their Modular Enforcement*. Florida International University Distinguished Lecture (Dec. 2012), IBM T. J. Watson Research Center (Nov. 2012).
- *Experiments in Mechanized Verification*. City College, City University of New York, May 2012.
- *Modular Reasoning about Object-based Programs*. LFCS, University of Edinburgh (Sep. 2012), ETH Zurich (Dec. 2011).
- *Verification of Access Control and Information Flow Policies using Dependent Types*. Chalmers University (Aug. 2011).

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- *Local Reasoning and Dynamic Framing for the Composite Pattern with Clients*. Univ. of Verona (Nov. 2010); 3rd International Conference on Verified Software: Tools, Theories and Experiments (VSTTE) (Aug. 2010).
- *Region Logic: Local Reasoning, Global Invariants*: IMDEA Software Institute, Madrid, Spain Universidad Complutense, Madrid, Spain (Feb. 2010); Microsoft Research, Bangalore, India (Sep. 2009); Dagstuhl Seminar on Types, Logics and Semantics of State (Jul. 2009); 22nd European Conference on Object-oriented Programming (ECOOP'08), Paphos, Cyprus, (Jul. 2008).
- *Regional Logic for Local Reasoning about Global Invariants*. Programming Languages and Methodology group, Microsoft Research, Redmond (Oct. 2007)
- *Semantics and Enforcement of Information Flow Policies*. University of Edinburgh, Scotland (Sept. 2007).
- *Information Flow, Modularity, and Declassification*. Dagstuhl Seminar on Mobility, Ubiquity, Security, Schloss Dagstuhl, Germany (Feb. 2007), Danish Technological University, Kongens Lyngby, Denmark (Feb. 2007), Chalmers Technological University, Göteborg, Sweden (Feb. 2007) University of Aarhus, Aarhus, Denmark, Pi-Lambda Seminar (Feb. 2007), Microsoft Research, Redmond, (Oct. 2006), IBM Research, (Sept. 2006), Microsoft Research, Cambridge, U.K. (July 2006); Univ. of Verona, Verona, Italy (July 2006); Open Software Quality Project Retreat (May 2006), Santa Cruz.
- *A Logic for Information Flow for Information Flow in Object-oriented Programs*. 33rd Annual ACM Conference on Principles of Programming Languages, Charleston, South Carolina, January 2006.
- *A Logical Specification of Information Flow*. Harvard University, Programming Wednesdays (Nov. 2005); Boston University, Church Seminar (Nov. 2005)
- *Stack-based Access Control and Secure Information Flow for Java-like Languages*. Politechnic University, Brooklyn (Nov. 2006); Rutgers University (Nov. 2006); Univ. of California, Davis (May 2006); Brown University, (Nov. 2005)
- *Information Flow Analysis and Independence*. Open Software Quality Project Retreat (May 2005), Santa Cruz.
- *A Logic for Information Flow Analysis with an Application to Forward Slicing*. Stevens Institute of Technology, (Apr. 2005).
- *Stack-based Access Control for Secure Information Flow*. City University of New York, (Apr. 2004); Construction and Analysis of Safe, Secure and Interoperable Smart Cards (CASSIS) Workshop, Marseilles (Mar. 2004); Dagstuhl Seminar 03411 on Language-based Security, (Oct. 2003), Schloss Dagstuhl, Germany.
- *Using Access Control for Secure Information Flow in a Java-like language*. 16th IEEE Computer Security Foundations Workshop, (July 2003), Asilomar, California.
- *Secure Information Flow and Pointer Confinement in a Java-like language*. 15th IEEE Computer Security Foundations Workshop, (June 2002), Cape Breton, Nova Scotia, Canada. Cornell University (Mar. 2003); Pointerfest, Queen Mary, Univ. of London (Aug 2002); Herriot-Watt University, Scotland (Aug 2002); Open Software Quality Project Retreat (May 2002), Santa Cruz.
- *Notions of Dependence in Program Analyses*. Worcester Polytechnic Institute (Mar. 2001); Kansas State University (Feb. 2001).
- *Applications of Type-based Program Analysis: Information-flow Analysis and Control-flow Analysis-based Program Transformations*. IBM T. J. Watson Research Center, (Oct. 2000); New York University, Programming and Verification Seminar (Oct. 2000).
- *Semantics-based Design and Proofs of Correctness of Control-flow Analysis-based Program Transformations*. Yale University (Feb. 2001); Kansas State University (Feb. 2001); Queen Mary and Westfield College, London, England (Jan. 2001); DIKU, University of Copenhagen, Denmark, TOPPS Seminar (Jan. 2001); BRICS, University of Aarhus, Denmark (Jan. 2001); Boston University, Church Seminar (Dec. 2000), Stevens Institute of Technology, (Oct. 2000); New Jersey Programming Languages and Systems Seminar, (Aug. 2000).

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- *Region Analysis and the Polymorphic Lambda Calculus*. The IT University of Copenhagen (Jan. 2001).
- *A Core Calculus of Dependency*. BRICS, University of Aarhus, Denmark (Feb. 2000); The IT University of Copenhagen, Denmark (Feb. 2000); University of Sheffield, England (Jan. 2000); Jadavpur University, India (Jan. 2000); National University of Singapore (Dec. 1999); 26th Annual ACM Conference on Principles of Programming Languages (POPL), San Antonio, Texas, January 1999.
- *A Unified Treatment of Dependency*. Bell Laboratories, New Jersey Programming Languages and Systems Seminar, June 1998.
- *A Modular, Polyvariant, and Type-based Closure Analysis*. 2nd ACM International Conference on Functional Programming, Amsterdam, The Netherlands (Jun. 1997); NEC Research Institute, New Jersey Programming Languages and Systems Seminar, (Nov. 1996); DIKU, University of Copenhagen, Denmark, TOPPS Seminar, (Oct. 1996); BRICS Seminar, University of Aarhus, Denmark, (Oct. 1996).
- *Polyvariant Closure Analysis with Rank 2 Intersection Types*. Northeastern University, Mitchell Wand's Seminar, (May 1996), Boston University, Church Project Seminar, (May 1996); INRIA Rennes, France, Equipe LANDE, (May 1996).
- *Stackability in higher-order, call-by-value, functional and imperative programming languages*. Ecole Normale Supérieure, Paris, Equipe Sémantique, Preuves et Interprétation Abstraite, (Dec. 1995); University of Tokyo, (Jul. 1995).
- *The Semantics and Implementation of Bindings in Higher-Order Programming Languages*. Department of Computing and Information Sciences, Kansas State University, Ph.D. defense, (Apr. 1995).
- *Stackability in the Simply-Typed, Call-by-Value Lambda Calculus*. 1st International Static Analysis Symposium, Namur, Belgium, (Sept. 1994); INRIA Rennes, France, Equipe LANDE, (Sept. 1994); First Atlantique Workshop on Semantics-Based Program Manipulation, Portland, Oregon, (Jan. 1994).
- *A Categorical Interpretation of Landin's Correspondence Principle*. 9th Conference on Mathematical Foundations of Programming Semantics, New Orleans, Louisiana, (Apr. 1993).

Supervisory Activities

PhD thesis supervision

- Stan Rosenberg (PhD co-supervisor with David A. Naumann), Stevens Institute of Technology, Hoboken, New Jersey, USA. *Region Logic: Local Reasoning for Java Programs and its Automation*. Date of defense: June 27, 2011. First employment: Proclivity Systems, New York.
- Qi Sun (PhD co-supervisor with David A. Naumann), Stevens Institute of Technology, Hoboken, New Jersey, USA. *Constraint-based Modular Secure Information Flow Inference for Object-Oriented Programs*. Date of defense: October 31, 2007. First employment: Google, Inc.
- Gurvan Le Guernic (PhD co-supervisor with Thomas Jensen and David A. Schmidt), Kansas State University, USA and Université de Rennes, Rennes, France. Le Guernic did a "double PhD" at Kansas State and Rennes. *Confidentiality Enforcement using Dynamic Information Flow Analyses*. Date of defense: September 27, 2007. First employment: Postdoctoral researcher, Microsoft/INRIA, Paris, France.

Master's thesis supervision

- Sruthi Bandhakavi at Kansas State University. (Fall 2004 -- Fall 2005). *Modular Reasoning about Information Flow in Object-oriented Programs*. Date of Completion: December 2005. Accepted as Research Assistant in PhD program in Computer Science, University of Illinois, Urbana-Champaign (Spring 2006).
- Edward Walters at Stevens Institute of Technology. *Flow-Graphs for Control Flow Analysis of Higher-Order Programming Languages* (1998--1999). Date of Completion: November 1999. First employment: Bell Laboratories, Lucent Technologies.

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Postdoctoral supervision

- Dr. Alexander Malkis, April 2010 -- April 2012. *IMDEA Software Institute*, Madrid, Spain
- Dr. François Pessaux, January 2000 -- July 2001. *Stevens Institute of Technology*, Hoboken, NJ.

Intern supervision

- Shachar Itzhaky, Tel Aviv University, June 2012 -- September 2012. *IMDEA Software Institute*
- James Gordon Stewart, Princeton University, June 2011 -- August 2011. *IMDEA Software Institute*
- Avraham Shinnar, Harvard University, June 2007 -- August 2007. *IBM T.J. Watson Research Center*
- Tamara Rezk, INRIA Sophia Antipolis, April 2004 -- June 2004. *Kansas State University*

Students supported as Research Assistants

- Gurvan Le Guernic Kansas State University, 2003 -- 2007.
- Sanghamitra Das Kansas State University, 2005 -- 2008.
- Sruthi Bandhakavi, Kansas State University, 2004 -- 2005.
- Edwin Rodriguez, Kansas State University, 2004 -- 2006.

Participation in PhD and MS Thesis Committees

PhD Thesis Committees (USA)

- Elodie-Jane Sims, Kansas State University, USA and Ecole Polytechnique, France; (supervisors Prof. David A. Schmidt and Dr. R. Cousot).
- Riccardo Medel, Stevens Institute of Technology, USA; (supervisor Dr. A. Compagnoni).
- Sofya Poger, Stevens Institute of Technology, USA; (supervisor Prof. A. Satyanarayana).
- Chung Yung, New York University, USA; (supervisor Dr. B. Goldberg).

PhD Thesis Examinations and Reports (International)

- Arsenii Rudich, ETH Zurich, Switzerland; (supervisor: Prof. P. Muller.)
- Niklas Broberg, Chalmers University, Göteborg, Sweden; (supervisor: Prof. D. Sands.)
- Laurent Hubert, Université de Rennes I, Rennes, France; (supervisors: Dr. T. Jensen and Dr. D. Pichardie.)
- Noam Rinetzky, Tel Aviv University, Tel Aviv, Israel; (supervisor: Prof. M. Sagiv.)
- Terkel K. Tolstrup, Danish Technological University, Kongens Lyngby, Denmark; (supervisors: Prof. H. R. Nielson and Prof. F. Nielson.)
- Damiano Zanardini, University of Verona, Verona, Italy; (supervisor: Prof. R. Giacobazzi.)
- Anders Sandholm, BRICS, University of Aarhus, Denmark; (supervisor: Dr. M. I. Schwartzbach.)

MS Thesis Committees

- Dustin De Boer, Kansas State University, USA; (supervisor: Dr. Alley Stoughton.)
- Venkatesh Prasad Ranganath, Kansas State University, USA; (supervisor: Prof. John Hatcliff.)

Professional Service

Program Committees

- Workshop on Higher-Order Programming with Effects (HOPE), Boston, USA, 2013.
- Satellite workshop of ICFP. International Static Analysis Symposium (SAS), Seattle, USA, 2013.
- 6th Indian Software Engineering Conference (ISEC), New Delhi, India, 2013.
- Workshop on Logics for Systems Analysis (LfSA), Berkeley, USA, 2012 (a satellite workshop of CAV 2012).
- ETAPS Conference on Principles of Security and Trust (POST), Tallinn, Estonia, 2012.

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- International Static Analysis Symposium (SAS), Venice, Italy, 2011.
- International Formal Methods Symposium (FM), Limerick, Ireland, 2011.
- Workshop on Programming Languages and Analysis for Security (PLAS), Toronto, Canada, 2010, satellite workshop of PLDI. European Symposium on Programming (ESOP), Paphos, Cyprus, 2010.
- Workshop on Formal Techniques for Java-like Programs (FTfJP), Genova, Italy, 2009. Satellite workshop of ECOOP. Annual ACM Symposium on Principles of Programming Languages (POPL), Savannah, Georgia, 2009.
- Workshop on Formal Techniques for Java-like Programs (FTfJP), Cyprus, 2008. Satellite workshop of ECOOP.
- Joint Workshop on Foundations of Computer Security and Automated Reasoning for Security Protocol Analysis (FCS-ARSPA), affiliated to LICS 2007 and ICALP 2007, Wroclaw, Poland, 2007.
- Workshop on Programming Languages and Analysis for Security (PLAS), Ottawa, Canada, 2006, satellite workshop of PLDI.
- International Static Analysis Symposium (SAS), Seoul, Korea, 2006.
- European Symposium on Programming (ESOP), Vienna, Austria, 2006.
- First workshop on Emerging Applications of Abstract Interpretation (EAAI), Vienna, Austria, 2006, satellite workshop of the ETAPS Joint Conferences.
- ACM Workshop on Program Analysis for Software Tools and Engineering (PASTE), Lisbon, Portugal, 2005.
- ACM SIGPLAN Workshop on Partial Evaluation and Semantics-Based Program Manipulation, San Antonio, Texas, 1999.

Fellowship and Grant Proposal Reviews

- Royal Society of New Zealand, Marsden Fund, 2009.
- John Simon Guggenheim Memorial Fellowship, 2004.
- Radcliffe Institute of Advanced Study (Harvard University) Fellowship, 2004.
- NSF Panelist.

Refereeing

- *Journals*: Studia Logica; Journal of Computer Security; Journal of the ACM; Mathematical Structures in Computer Science; Higher Order and Symbolic Computation; ACM Transactions on Programming Languages and Systems; Information and Software Technology; Journal of Functional Programming.
- *Conferences*: Intl. Conference on Automata, Languages and Programming (ICALP); Algebraic Methodology and Software Technology (AMAST); Computer Security Foundations Workshop (CSFW); Formal Methods (FM); ACM Symposium on Principles of Programming Languages (POPL); ACM Conference of Foundations of Software Engineering (FSE); International Conference on Functional Programming (ICFP); ECOOP Workshop on Formal Techniques for Java-like Programs (FTfJP); Computer-Aided Verification (CAV); European Symposium on Programming (ESOP); ACM Conference on Partial Evaluation and Program Manipulation (PEPM); Typed Lambda Calculus and Applications (TLCA); Workshop on Formal Methods and Security Protocols; Static Analysis Symposium (SAS); Programming Language Implementation and Logics of Programs (PLILP); Mathematical Foundations of Computer Science (MFCS).

University and Institutional Service

IMDEA Software Institute 2009 -- 2013. Established first US-style tenure system in Spain; Hired exceptionally qualified international faculty applicants; Created a vibrant environment of internal and external research collaborations, tool building and funding success; Provided a base standard for IMDEA's future growth; Ensured visibility of IMDEA as a top-tier research institute in rigorous software technologies.

- Led Faculty Recruiting at IMDEA
  - Coordinated discussion on hiring priorities and candidates

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- Wrote hiring advertisements.
- Recruited prospective candidates at conferences.
- Reported on hiring process to Scientific Advisory Board.
- Hired 6 tenure-track faculty (Assistant Research Professors), one tenured faculty (Associate Research Professor, currently IMDEA's Deputy Director), three fixed-term researchers.

- Designed IMDEA's tenure procedures.
  - Author of institute tenure document, 2010 – 2012
  - Engaged in discussions with, and obtained approval from the Scientific Advisory Board on the tenure document.
  - Initiator of mentorship program for tenure-track faculty and instituted explicit responsibility of senior faculty to mentor junior faculty.
  - Coordinator of mid-tenure and tenure reviews, 2011 -- 2013.
- Provided guidance to faculty on writing mid-tenure and tenure document.
- Directed discussions in institute evaluations of faculty and summarized external reviews and internal recommendations in formal letters.
- Coordinated writing of work packages and research lines for a Spanish national project proposal across multiple universities, 2012.
- Mentored several tenure-track faculty, 2009 -- present.
- Managed graduate student and intern recruitment through visits and contacts to educational institutions in India.

***Kansas State University*, 2001-2008**

- CIS department Strategic Planning Committee, 2006
- CIS department Hiring Committee, 2005--2007
- CIS department Undergraduate Studies Committee, 2001--2004
- CIS department Seminar Committee, 2002--2007 (chair 2005--2007)

***Stevens Institute of Technology,* 1997-2001**

- CS department Graduate Admissions Committee, 1997—2001
- CS department Undergraduate Curriculum Development Committee, 1997--2001

Fellowships

- DART (Design and Analysis of Research Tools) fellowship, Danish National Research Councils, 1996.
- Postdoctoral fellowship, Ecole Polytechnique, 1995-1996.
- CIES Fellowship, Government of France, Summer 1992.
- National Scholarship, Government of India, 1981.

Personal

- Erdös number: 3 (Pál Erdös --- Shaharon Shelah ---- Neil Immerman ---- Anindya Banerjee).
- Citizenship: USA.
- Member, Association for Computing Machinery and SIGPLAN.