Last updated Jun. 2011

William Thies

Microsoft Research India
196/36 2nd Main, Sadashivanagar
Bangalore, 560080, India

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thies@microsoft.com

Education

Massachusetts Institute of Technology 2002—Feb. 2009
Doctor of Philosophy, Computer Science and Engineering

Thesis: Language and Compiler Support for Stream Programs.
Recipient of the 2010 ACM SIGPLAN Outstanding Doctoral Dissertation Award
Advisor: Saman Amarasinghe.

New England Biolabs Aug. 2004
Certified Molecular Biologist

Intensive two-week course on experimental molecular biology, with significant laboratory experience.

Massachusetts Institute of Technology 1997—2002
Bachelors of Science, Mathematics
Bachelors of Science, Computer Science and Engineering
Masters of Engineering, Computer Science and Engineering

Undergraduate concentration in economics; graduate concentration in biology. GPA: 5.0/5.0.

Honors

International co-winner, ACM SIGPLAN Outstanding Doctoral Dissertation Award	2009
National co-winner, Eta Kappa Nu Outstanding EECS Student Award	2001
Siebel Scholar ($25,000 scholarship to "top 5" computer science students at MIT)	2000
Eta Kappa Nu, Tau Beta Pi, Sigma Xi, and Phi Beta Kappa honor societies	2000, 2001
Finalist, Westinghouse Science Talent Search	1997
Eagle Scout	1994

Professional Experience

Microsoft Research India, Technologies for Emerging Markets Group
Bangalore, India Dec. 2008—present

Researcher. Leading several diverse and open research projects, often in close collaboration with student interns and community partners.

MIT Computer Science and Artificial Intelligence Laboratory, Compilers Group
Cambridge, MA Jan. 2000—Dec. 2008

Research assistant. Led the design and implementation of StreamIt, a language and compiler for high-performance streaming applications. Also developed programmable microfluidic chips for automating biology protocols, as well as TEK, an email-based search engine for the developing world.

Compaq Computer Corporation, Cambridge Research Lab
Cambridge, MA Jun. 1999—Aug. 2000

Research intern. Implemented Array SSA Form, a new compiler representation, in Compaq's *Swift* optimizing Java compiler. Developed a multi-threaded model of computation based on Array SSA.

MIT Media Laboratory, Epistemology and Learning Group
Cambridge, MA Sep. 1997—Sep. 1999

Software engineer. Developed a Java version of StarLogo, a massively parallel programming language and modeling environment. Applied StarLogo to research pattern formation in the Drosophila retina.

Jentek Sensors, Inc. Watertown, MA May 1998—Aug. 1998

Software engineer. Developed electromagnetic sensing software for use by Army, Navy, and Fortune 500 companies. Specialized in graphical user interface, data visualization, and instrument control.

Pennsylvania State University, Entomology Department
University Park, PA Feb. 1996—Aug. 1997

Computer programmer. Designed and implemented fourteen artificial life models for inclusion in Camazine et al., *Self-Organization in Biological Systems*, Princeton University Press, 2001.

Refereed Journal Publications

1. Indrani Medhi, Somani Patnaik, Emma Brunskill, S. N. Nagasena Gautama, William Thies, and Kentaro Toyama, Designing Mobile Interfaces for Novice and Low-Literacy Users, *ACM Transactions on Computer-Human Interaction*, 18:1, 2011.

2. Vaishnavi Ananthanarayanan and William Thies, Biocoder: A programming language for standardizing and automating biology protocols, *Journal of Biological Engineering* 4:13, 2010.

3. William Thies, Frédéric Vivien, and Saman Amarasinghe, A Step Towards Unifying Schedule and Storage Optimization, *Transactions on Programming Languages and Systems* 29 (2007), no. 6.

4. William Thies, John Paul Urbanski, Todd Thorsen, and Saman Amarasinghe, Abstraction Layers for Scalable Microfluidic Biocomputing, *Natural Computing* (2007).

5. Blaise Gassend, Charles W. O'Donnell, William Thies, Andrew Lee, Marten van Dijk, and Srinivas Devadas, Learning Biophysically-Motivated Parameters for Alpha Helix Prediction, *BMC Bioinformatics* 8(Suppl 5) (2007), no. S3.

6. John Paul Urbanski, William Thies, Christopher Rhodes, Saman Amarasinghe, and Todd Thorsen, Digital Microfluidics Using Soft Lithography, *Lab on a Chip* 6 (2006), no. 1, 96–104.

7. Saman Amarasinghe, Michael I. Gordon, Michal Karczmarek, Jasper Lin, David Maze, Rodric M. Rabbah, and William Thies, Language and Compiler Design for Streaming Applications, *International Journal of Parallel Programming* (2005).

Refereed Conference Publications

8. Abhishek Udupa, Kaushik Rajan, and William Thies, Alter: Leveraging Breakable Dependences for Parallelization, In *Conference on Programming Language Design and Implementation (PLDI)*, 2011.

9. Jay Chen, David Hutchful, William Thies, and Lakshminarayanan Subramanian, Analyzing and Accelerating Web Access in a School in Peri-Urban India, In *International World Wide Web Conference (WWW)*, 2011.

10. Gaurav Paruthi and William Thies, Utilizing DVD Players as Low-Cost Offline Internet Browsers, In *Conference on Human Factors in Computing Systems (CHI)*, 2011. **Best of CHI Honorable Mention.**

11. Shashank Khanna, Aishwarya Ratan, James Davis, and William Thies, Evaluating and Improving the Usability of Mechanical Turk for Low-Income Workers in India, In *Symposium on Computing for Development (DEV)*, 2010.

12. Kiran Gaikwad, Gaurav Paruthi, and William Thies, Interactive DVDs as a Platform for Education, In *International Conference on Information and Communication Technologies and Development (ICTD)*, 2010.

13. William Thies and Saman Amarasinghe, An Empirical Characterization of Stream Programs and its Implications for Language and Compiler Design, In *International Conference on Parallel Architectures and Compilation Techniques (PACT)*, 2010.

14. Nada Amin, William Thies, and Saman Amarasinghe, Computer-Aided Design for Microfluidic Chips Based on Multilayer Soft Lithography, In *International Conference on Computer Design – Invited Paper (ICCD)*, 2009.

15. William Thies, Steven Hall, and Saman Amarasinghe, Manipulating Lossless Video in the Compressed Domain, In *ACM Multimedia*, 2009.

16. Somani Patnaik, Emma Brunskill, and William Thies, Evaluating the Accuracy of Data Collection on Mobile Phones: A Study of Forms, SMS, and Voice, In *International Conference on Information and Communication Technologies and Development (ICTD)*, 2009.

17. William Thies, Vikram Chandrasekhar, and Saman Amarasinghe, A Practical Approach to Exploiting Coarse-Grained Pipeline Parallelism in C Programs, In *International Symposium on Microarchitecture (MICRO)*, 2007.

18. Michael I. Gordon, William Thies, and Saman Amarasinghe, Exploiting Coarse-Grained Task, Data, Pipeline Parallelism in Stream Programs, In *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2006.

19. William Thies, John Paul Urbanski, Todd Thorsen, and Saman Amarasinghe, Abstraction Layers for Scalable Microfluidic Biocomputers, In *International Meeting on DNA Computing (DNA)*, 2006.

20. Sitij Agrawal, William Thies, and Saman Amarasinghe, Optimizing Stream Programs Using Linear State Space Analysis, In *International Conference on Compilers, Architecture, Synthesis for Embedded Systems (CASES)*, 2005.

21. Jiawen Chen, Michael I. Gordon, William Thies, Matthias Zwicker, Kari Pulli, and Frédo Durand, A Reconfigurable Architecture for Load-Balanced Rendering, In *SIGGRAPH / Eurographics Workshop on Graphics Hardware*, 2005.

22. William Thies, Michal Karczmarek, Janis Sermulins, Rodric Rabbah, and Saman Amarasinghe, Teleport Messaging for Distributed Stream Programs, In *Symposium on Principles and Practice of Parallel Programming (PPoPP)*, 2005.

23. Janis Sermulins, William Thies, Rodric Rabbah, and Saman Amarasinghe, Cache Aware Optimization of Stream Programs, In *Conference on Languages, Compilers, Tools for Embedded Systems (LCTES)*, 2005.

24. Amy Williams, William Thies, and Michael D. Ernst, Static Deadlock Detection for Java Libraries, In *European Conference on Object-Oriented Programming (ECOOP)*, 2005.

25. Andrew A. Lamb, William Thies, and Saman Amarasinghe, Linear Analysis and Optimization of Stream Programs, In *Conference on Programming Language Design and Implementation (PLDI)*, 2003.

26. Michal Karczmarek, William Thies, and Saman Amarasinghe, Phased Scheduling of Stream Programs, In *Conference on Languages, Compilers, Tools for Embedded Systems (LCTES)*, 2003.

27. Michael I. Gordon, William Thies, Michal Karczmarek, Jasper Lin, Ali S. Meli, Andrew A. Lamb, Chris Leger, Jeremy Wong, Henry Hoffmann, David Maze, and Saman Amarasinghe, A Stream Compiler for Communication-Exposed Architectures, In *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2002.

28. William Thies, Michal Karczmarek, and Saman Amarasinghe, StreamIt: A Language for Streaming Applications, In *International Conference on Compiler Construction (CC)*, 2002.

29. Libby Levison, William Thies, and Saman Amarasinghe, Providing Web Search Capability for Low-Connectivity Communities, In *International Symposium on Technology and Society (ISTAS)*, 2002.

30. William Thies, Janelle Prevost, Tazeen Mahtab, Genevieve T. Cuevas, Saad Shakhshir, Alexandro Artola, Binh D. Vo, Yuliya Litvak, Sheldon Chan, Sid Henderson, Mark Halsey, Libby Levison, and Saman Amarasinghe, Searching the World Wide Web in Low-Connectivity Communities, In *International World Wide Web Conference, Global Community Track*, 2002.

31. William Thies, Frédéric Vivien, Jeffrey Sheldon, and Saman Amarasinghe, A Unified Framework for Schedule and Storage Optimization, In *Conference on Programming Language Design and Implementation (PLDI)*, 2001.

Refereed Workshop Publications

32. Prasanta Bhattacharya and William Thies, Computer Viruses in Urban Indian Telecenters: Characterizing an Unsolved Problem, In *Workshop on Networked Systems for Developing Regions (NSDR)*, 2011.

33. William Thies, Aishwarya Ratan, and James Davis, Paid Crowdsourcing as a Vehicle for Global Development, In *CHI Workshop on Crowdsourcing and Human Computation*, 2011.

34. Michael Paik, Navkar Samdaria, Aakar Gupta, Julie Weber, Nupur Bhatnagar, Shelly Batra, Manish Bhardwaj, and William Thies, A Biometric Attendance Terminal and its Application to Health Programs in India, In *Workshop on Networked Systems for Developing Regions (NSDR)*, 2010.

35. Rohit Chaudhri, Gaetano Borriello, and William Thies, FoneAstra: Making Mobile Phones Smarter, In *Workshop on Networked Systems for Developing Regions (NSDR)*, 2010.

36. Pratik Kotkar, William Thies, and Saman Amarasinghe, An Audio Wiki for Publishing User-Generated Content in the Developing World, In *HCI for Community and International Development (Workshop at CHI)*, 2008.

37. Blaise Gassend, Charles W. O'Donnell, William Thies, Andrew Lee, Marten van Dijk, and Srinivas Devadas, Predicting Secondary Structure of All-Helical Proteins Using Hidden Markov Support Vector Machines, In *Workshop on Pattern Recognition in Bioinformatics (PRIB)*, 2006.

38. Libby Levison, Bill Thies, and Saman Amarasinghe, The TEK Search Engine, In *Workshop on Development by Design (DYD)*, 2001.

Refereed Poster Abstracts and Short Publications

39. William Thies, Why it is Hard to Identify Technical Research Problems in ICT4D and How to Make it Easier, In *CCC Workshop on Computer Science and Global Development*, 2009.

40. Vaishnavi Ananthanarayanan and William Thies, Towards a High-Level Programming Language for Standardizing and Automating Biology Protocols, In *International Workshop on Bio-Design Automation*, 2009.

41. Pratik Kotkar, William Thies, and Saman Amarasinghe, An Audio Wiki for Building Local Repositories of Knowledge in the Developing World, In *Poster Session, Workshop on Wireless Systems: Advanced Research and Development (WISARD)*, 2008.

42. Blaise Gassend, Charles W. O'Donnell, William Thies, Andrew Lee, Marten van Dijk, and Srinivas Devadas, Learning Biophysically-Motivated Parameters for Alpha Helix Prediction, In *Poster Session, International Conference on Research in Computational Molecular Biology (RECOMB Poster Session)*, 2006.

43. William Thies, John Paul Urbanski, Mats Cooper, David Wentzlaff, Todd Thorsen, and Saman Amarasinghe, Programmable Microfluidics, In *Wild and Crazy Ideas Session, International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS WACI)*, 2004.

44. William Thies, Michal Karczmarek, Michael Gordon, David Maze, Jeremy Wong, Henry Hoffmann, Matthew Brown, and Saman Amarasinghe, A Common Machine Language for Grid-Based Architectures, In *ACM SIGARCH Computer Architecture News*, 2002.

45. William Thies, Chemical Weathering in Bondhusbreen Glacier Valley, Norway: Implications for Global Carbon Cycle Models. In *EOS Trans. American Geophysical Union, 78 (17)* Spring Meeting, 1997.

Other Publications

46. William Thies, Language and Compiler Support for Stream Programs, Ph.D. Thesis, Massachusetts Institute of Technology, February, 2009.

47. Peter Mattson, William Thies, Lance Hammond, and Michael Vahey, Streaming Virtual Machine Specification, Version 1.0, Tech. report, 2004, `http://www.morphware.org`.

48. William Thies, A Unified Framework for Schedule and Storage Optimization, M.Eng. Thesis, Massachusetts Institute of Technology, June, 2002.

Invited Talks

1. CGNet Swara: A Voice Portal for Citizen News Journalism.
   CTED Annual Conference at NYU Abu Dhabi Mar. 2011

2. Microfluidic Biochips: Design, Programming, and Optimization.
   4th Workshop on Nanocomputing and Biochips, Indian Statistical Institute Mar. 2011

3. Improving Access and Usability of Technologies in Developing Regions.
   IIT Delhi Aug. 2010

4. Interactive DVDs as a Platform for Education.
   MSR Summer School on Computing for Socio-Economic Development Jun. 2010

5. Leveraging Familiar Technologies for Citizen Journalism, Education, and Healthcare in India.
   Stanford University, Seminar on Liberation Technology Mar. 2010

6. Technologies for Healthcare Delivery.
   International Conference on VLSI Design Jan. 2010
   GE Healthcare Symposium Nov. 2009
   Birla Institute of Technology Feb. 2010

7. Designing Mobile Interfaces for Novice and Low-Literate Users.
   3rd India International HCI Conference (USID) Sep. 2009

8. Monitoring and Improving Rural Tuberculosis Treatment.
   mHealth India Workshop, Bangalore, India Apr. 2009

9. Improving Rural Healthcare Delivery via Transparent Monitoring.
   Medical Informatics and Telemedicine Conference (MEDITEL), Chennai, India Dec. 2008

10. How to Get Into Graduate School in the USA: A Lecture and Workshop.
    Birla Institute of Technology, Patna Oct. 2008

11. Extending the Capabilities of the Internet to the Rural Developing World.
    Carnegie Mellon University Apr. 2008
    Microsoft Research India Jan. 2008
    Princeton University Mar. 2007
    Google New York Jul. 2005

12. Stream Programming: Luring Programmers into the Multicore Era.
    University of California at Berkeley Feb. 2008
    Harvard University Feb. 2008
    University of Washington Mar. 2008
    Cornell University Mar. 2008
    University of Toronto Mar. 2008
    University of Illinois at Urbana-Champaign Mar. 2008
    University of Wisconsin-Madison Mar. 2008

Stanford University Apr. 2008
University of Texas at Austin Apr. 2008
Carnegie Mellon University Apr. 2008

13. Programmable Microfluidics.
Microsoft Research India Dec. 2007
University of California, Berkeley Oct. 2007
Stanford University Oct. 2007
Pennsylvania State University Apr. 2007

14. StreamIt: A Compiler Infrastructure for Stream Programs.
IBM Programming Languages Day May 2004

15. Architectures, Languages, and Compilers for the Streaming Domain (Tutorial).
International Conf. on Parallel Architecture and Compilation Techniques Sep. 2003

16. The TEK System: Browsing the Web in Low-Connectivity Communities.
HP Labs India Jan. 2002
Indian Institute of Technology, Madras Jan. 2002
University of Moratuwa Jan. 2002

Invited Panelist

1. Bridging the Connectivity Divide.
International Conference on Communication Systems and Networks (COMSNETS) Jan. 2011

2. Social Networking, Health and Privacy in the Indian Context.
Workshop on Networked Healthcare Technology (NETHEALTH) Jan. 2011

Talks Corresponding to Conference Papers

1. Evaluating and Improving the Usability of Mechanical Turk for Low-Income Workers in India.
Symposium on Computing for Development (DEV) Dec. 2010.

2. An Empirical Characterization of Stream Programs
and its Implications for Language and Compiler Design.
International Conference on Parallel Architectures
and Compilation Techniques (PACT) Sep. 2010.

3. Manipulating Lossless Video in the Compressed Domain.
ACM Multimedia Oct. 2009.

4. Computer-Aided Design for Microfluidic Chips Based on Multilayer Soft Lithography.
International Conference on Computer Design (ICCD) Oct. 2009.

5. Evaluating the Accuracy of Data Collection on Mobile Phones:
A Study of Forms, SMS, and Voice.
International Conference on Information and
Communication Technologies and Development (ICTD) Apr. 2007

6. A Practical Approach to Exploiting Coarse-Grained Pipeline Parallelism in C Programs.
International Symposium on Microarchitecture (MICRO) Dec. 2007

7. Predicting Secondary Structure of All-Helical Proteins
   Using Hidden Markov Support Vector Machines.
   Workshop on Pattern Recognition in Bioinformatics (PRIB) Aug. 2006

8. Abstraction Layers for Scalable Microfluidic Biocomputers.
   International Meeting on DNA Computing (DNA) Jun. 2006

9. Optimizing Stream Programs Using Linear State Space Analysis.
   International Conference on Compilers, Architecture, and Synthesis for Embedded Systems (CASES) Sep. 2005

10. Teleport Messaging for Distributed Stream Programs.
    Symposium on Principles and Practice of Parallel Programming (PPoPP) Jun. 2005

11. Programmable Microfluidics.
    Wild and Crazy Ideas Session, International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS WACI) Oct. 2004

12. StreamIt: A Language for Streaming Applications.
    International Conference on Compiler Construction (CC) Apr. 2002

13. A Unified Framework for Schedule and Storage Optimization.
    Conference on Programming Language Design and Implementation (PLDI) Jun. 2001

Software Artifacts

1. BioCoder: A Programming Language for Biology Protocols Dec. 2009—present
   The first language for standardizing and automating the steps of a biology experiment.
   `http://research.microsoft.com/en-us/um/india/projects/biocoder/`

2. StreamIt Compiler Infrastructure Oct. 2003—present
   Over 850 unique, registered downloads from 300 institutions.
   `http://cag.csail.mit.edu/streamit`

3. TEK: An Email-Based Web Browser Jul. 2003—present
   Freely-distributed installation CD has reached users in over 30 countries.
   `http://cag.csail.mit.edu/tek`

4. AutoCAD Plugin for Microfluidic Chips Nov. 2007—present
   Newly released tool for automating the design of microfluidic chips.
   `http://cag.csail.mit.edu/biostream/cad`

Grants

1. Programmable Microfluidics: A Universal Substrate for Biological Computing.
   National Science Foundation ($550,000).
   Co-authored with Saman Amarasinghe, Todd Thorsen, and Jeremy Gunawardena, 2005.

2. uBox: A Low-Cost Device for Monitoring and Improving Drug Adherence.
   National Collegiate Inventors & Innovators Alliance ($19,930).
   Co-authored with Manish Bhardwaj, Sara Cinnamon, Alex Krull, Jessica Leon, Nikhil Nadkarni, Goutam Reddy, Oliver Venn, and Amy Smith, 2007.

3. uBox: A Low-Cost Device for Monitoring and Improving Rural Tuberculosis Treatment Programs.
   MIT IDEAS Competition ($7,500).
   Co-authored with Manish Bhardwaj, Sara Cinnamon, Alex Krull, Jessica Leon, Nikhil Nadkarni, Oluwarotimi Okunade, Goutam Reddy, Jayodita Sanghvi, and Oliver Venn, 2007.

Selected Press

1. Fighting tuberculosis in India's slums.
   University of Chicago (Front Page) Apr. 2011

2. Citizens, not numbers.
   Hindustan Times Jan. 2011

3. How Amazon Mechanical Turk Fails Low-Income Workers, and How It Can Succeed.
   Fast Company Magazine Dec. 2010

4. And now for the Gondi news.
   Tehelka Magazine Sep. 2010

5. Voices in the wilderness.
   The Hindu Jul. 2010

6. Bringing news to India's poorest people.
   The Atlantic Jun. 2010

7. By the tribal, for the tribal.
   The Telegraph May 2010

8. A coming-out party.
   Hindustan Times May 2010

9. Phone media brings news to India's Maoist heartland.
   Hindustan Times May 2010

10. Chhattisgarh tribals turn into reporters on cellphones.
    Rediff News May 2010

11. Ear to the mobile.
    Hindu Business Lines May 2010

12. Giving a voice to India's villagers.
    BBC News Apr. 2010

13. News in dialects may soon be just a call away.
    The Hindu Feb. 2010

14. ICT research to boost India socio-economic development.
    EE Times India Jan. 2009

15. MIT Builds A Better Pillbox To Prevent Drug-resistant TB
Boston Globe Mar. 2008

16. Time To Take Your Medicine
Mumbai Mirror Feb. 2008

17. A Smart Pillbox To Improve Medication Compliance
Slashdot Feb. 2008

18. Smart Pillbox Could Be A Lifesaver
MIT News Office Feb. 2008

19. Smart pillbox joins the fight against TB
New Scientist Jan. 2008

20. MIT honors humanitarian tech invention
New York Times May 2007

21. Simpler programming for multicore computers.
Technology Review Apr. 2007

22. Science search made easier in developing nations.
CNET News Dec. 2005

23. Radio mail links Pacific islands.
BBC News Apr. 2004

24. A Search Engine For The Slower Net
Slashdot Jul. 2003

25. World's poor to get own search engine.
BBC News Jul. 2003

26. Search with TEK.
The Deccan Herald May 2003

Teaching and Mentoring Experience

Teaching Assistanceship
Introduction to Algorithms (MIT 6.046) with Charles Leiserson and Piotr Indyk Fall 2004
Delivered weekly lecture-style recitations; helped to prepare problem sets and exams.

Supervision or Co-supervision of Interns (Microsoft Research India)

1. Archit Bhise (MIT) Jun. 2011—present
   Project: Mining patterns in historical disasters to improve emergency response.

2. Arunesh Mathur (NIT Surathkal) May. 2011—present
   Project: Offline Wikipedia browser for low-end phones.

3. Shivam Maheshwari (IIT Bombay) May. 2011—present
   Project: Mobile advertising wizard for small entrepreneurs.

4. Niranjan Pai (SRM University) Jan. 2011—present
   Project: Affecting health-seeking behaviors via voice messages.

5. Kaleem Rahman (CMU Qatar) Nov. 2010—present
   Project: Evaluating and improving infrastructure in government schools.

6. Preeti Mudliar (UT Austin) Jan. 2011—Apr. 2011
   Project: Analysis of citizen news media on CGNet Swara.

7. Prasanta Bhattacharya (BITS Pilani) Jan. 2011—May 2011
   Project: Understanding and combating computer viruses in resource-poor environments.
   Published in the Workshop on Networked Systems for Developing Regions (NSDR 2011).

8. Nitesh Mor (IIT Delhi) May 2010—Aug. 2010
   Results: Innovative algorithm for compressing screens of text on TV-DVDs.

9. Samujjal Purkayastha (Tufts) May 2010—Aug. 2010
   Results: Full-featured Web and phone interface for a voice-based citizen news portal.

10. Vaishnavi Ananthanarayanan (BITS Pilani) Jan. 2009—Jun. 2010
    Results: Development and release of BioCoder, a programming language for biology protocols.
    Published in the Journal of Biological Engineering (2010).

11. Gaurav Paruthi (BITS Pilani) Jul. 2009—May 2010
    Results: A tool that can map 250,000 screens (e.g., of Wikipedia) to an interactive TV-DVD.
    Published in Information and Communication Technologies and Development (2010).

12. Aakar Gupta (DA-IICT) Jan. 2010—May 2010
    Results: An SMS server and electronic medical record system for tracking tuberculosis patients.
    Published in the Workshop on Networked Systems for Developing Regions (2010).

13. Navkar Samdaria (DA-IICT) Dec. 2009—May 2010
    Results: A full-featured fingerprinting terminal for tracking delivery of tuberculosis medication.
    Published in the Workshop on Networked Systems for Developing Regions (2010).

14. Shashank Khanna (IIT Bombay) Jan. 2010—Apr. 2010
    Results: Design of an improved Mechanical Turk interface for low-education workers.
    Published in the Symposium on Computing for Development (2010).

15. Michael Paik (NYU) Jun. 2009—Sep. 2009, Mar. 2010—Jun. 2010
    Results I: Design and implementation of a biometrics system for tracking tuberculosis patients.
    Results II: A tool for understanding the epidemiology of computer viruses in developing regions.
    Published in the Workshop on Networked Systems for Developing Regions (2010, 2011).

16. Kiran Gaikwad (National Institute of Design) Jun. 2009—Dec. 2009
    Results: An evaluation of using TVs and DVD players for display of PowerPoint teaching aids.
    Published in Information and Communication Technologies and Development (2010).

17. Thomas Smyth (Georgia Tech) May 2009—Aug. 2009
    Results: An ethnography of peer-to-peer media sharing over mobile phones in urban India.
    Published in the Conference on Human Factors in Computing Systems (2010).

Co-supervision of M.Eng. Students (MIT)

18. Ceryen Tan Sep. 2007—Dec. 2009
    Thesis: A Hybrid Static/Dynamic Approach to Scheduling Stream Programs

19. Nada Amin Sep. 2006—Dec. 2008
Thesis: Computer-Aided Design for Multilayer Microfluidic Chips. *Published in the International Conference on Computer Design (2009)*

20. David Zhang Sep. 2005—Sep. 2007
Thesis: A Streaming Computation Framework for the Cell Processor.
Published in the Workshop on Design, Architecture and Simulation of CMPs (2007).

21. Abdulbasier Aziz Apr. 2006—Jul. 2007
Thesis: Image-Based Motion Estimation in a Stream Programming Language.

22. Matthew Drake Oct. 2004—May 2006
Thesis: Stream Programming for Image and Video Compression.
Published in the International Parallel and Distributed Processing Symposium (2006).

23. Janis Sermulins Jun. 2003—May 2006
Thesis: Cache Optimizations for Stream Programs.
Published in the Conference on Languages, Compilers, and Tools for Embedded Systems (2005).

24. Sitij Agrawal Mar. 2003—Aug. 2004
Thesis: Linear State-Space Analysis and Optimization of StreamIt Programs.
Published in the Int. Conf. on Compilers, Arch., and Synthesis for Embedded Systems (2005).

25. Jeremy Wong Sep. 2001—Jan. 2004
Thesis: Modeling the Scalability of Acyclic Stream Programs.

26. Andrew Lamb Mar. 2002—Jun. 2003
Thesis: Linear Analysis and Optimization of Stream Programs.
Published in the Conference on Programming Language Design and Implementation (2003).

Co-supervision of Undergraduate Students (MIT)

27. Pratik Kotkar May 2007—Aug. 2007
Results: Prototype version of an audio message board.
Poster in the Workshop on Wireless Systems: Advanced Research and Development (2008). Short Paper in the Workshop on HCI for Community and International Development (2008).

28. Steven Hall Jan 2007—May. 2007
Results: Integrated tool for compressed-domain transformation of lossless video.
Published in ACM Multimedia (2009).

29. Michael D'Ambrosio Jan. 2007—May 2007
Results: Partial implementation of compressed-domain video transformations for H.264.

30. Jonathan Birnbaum Sep. 2007—Jun. 2008
Results: Prototype version of a flexible audio wiki.

31. Jimmy Li Sep. 2006—Dec. 2007
Results: Partial mapping of StreamIt to the Cell processor.
Published in the Workshop on Design, Architecture and Simulation of CMPs (2007).

32. Shirley Fung Sep. 2006—Mar. 2007
Results: Partial implementation of H.264 video encoding in StreamIt.

33. Thayaparan Kailainathan — Feb. 2006—Aug. 2006
    Results: Accurate estimation of number of Internet search results in a disconnected environment.

34. Mahendrakumar Senthivel — Feb. 2006—Aug. 2006
    Results: Internationalization of TEK search client, including translation to Tamil.

35. Thayarupan Rajendram — Feb. 2006—Aug. 2006
    Results: Disconnected query checking for TEK client.

36. Marjorie Cheng — May 2005—Aug. 2005
    Results: New user interface for TEK client.

37. Jasper Lin — Dec. 2001—Mar. 2005
    Results: Broad contributions to StreamIt compiler, from optimizations to parallelization.

38. Satish Ramaswamy — Mar. 2003—Jan. 2004
    Results: StreamIt implementations of FFTs and other kernels.

39. Tazeen Mahtab — May 2001—Sep. 2002
    Results: Complete implementation of the TEK server.

40. Ali Meli — Jun. 2002—Aug. 2002
    Results: StreamIt implementation of feature-aided radar tracking.

41. Chris Leger — Jun. 2002—Aug. 2002
    Results: StreamIt implementation of a vocoder and six sorting routines.

42. Matthew Brown — Sep. 2001—Nov. 2001
    Results: StreamIt implementation of an FM radio receiver.

43. Genevieve Cuevas — May 2001—Aug. 2001
    Results: Complete implementation of the TEK client.

44. Saad Shakhshir — May 2001—Aug. 2001
    Results: Robust transport layer for TEK.

45. Mark Halsey — May 2001—Aug. 2001
    Results: Testing and database support for TEK.

Co-supervision of Staff (MIT)

46. Allyn Dimock — Sep. 2005—Jun. 2007
    Results: Broad contributions to StreamIt backends, optimizations, and robustness.

47. Damon Berry — Oct. 2001—Mar. 2002
    Results: Robust release and installation package for TEK client.

Liaising to Funding Agencies

I served as the primary MIT representative to the Morphware Forum, a consortium of over 35 institutions (instigated by DARPA under the Polymorphous Computing Architectures program) that met regularly from 2001 to 2006 to establish a shared environment for portable programming on emerging multicore architectures. Via detailed conversations and 14 national meetings, I played a critical role in writing, refining, and establishing consensus on the Streaming Virtual Machine, an intermediate layer that served as a focus of the forum.

Professional Service

Founding Organizer

MIT Student Project Expo	2001—2008
MIT Reading Group on Information and Communication Technologies for Development	2003, 2007
MIT Compiler Reading Group	2006

Organizer

Program co-chair, Symposium on Computing for Development (DEV)	2012
Program co-chair, Workshop on Networked Healthcare Technology (NetHealth)	2012
Program co-chair, Workshop on Networked Systems for Developing Regions (NSDR)	2011
Organizing committee, Workshop on Intelligent User Interfaces for Dev. Regions (IUI4DR)	2011
Organizing committee, Workshop on Networked Healthcare Technology (NetHealth)	2011
Organizing committee, CCC Workshop on Computer Science and Global Development	2009
Organizing committee, CCC Workshop on Computer Science and Global Development	2009
Demo co-chair, International Conference on ICTs and Development (ICTD)	2009

Program Committee Member

Conference on Human Factors in Computing Systems (CHI)	2010–2012
Workshop on Networked Healthcare Technology (NetHealth)	2011–2012
Symposium on Computing for Development (DEV)	2010, 2012
International Conference on ICTs and Development (ICTD)	2009, 2010, 2012
World Wide Web Conference (WWW)	2011
Workshop on Networked Systems for Developing Regions (NSDR)	2009–2011
Workshop on Intelligent User Interfaces for Developing Regions (IUI4DR)	2011
ASPLOS Ideas & Perspectives Session	2011
Workshop on Qual Meets Quant (at ICTD)	2011
Workshop on Qual Meets Quant at ICTD (QMQ)	2010
Workshop on Software Tools for MultiCore Systems (STMCS)	2008
Student Workshop, MIT Computer Science and Artificial Intelligence Laboratory	2005
International Workshop on Parallel and Distributed Embedded Systems	2005
International Conference on Development by Design	2002

External Review Committee

Conference on Programming Language Design and Implementation (PLDI)	2010, 2011

Reviewer

Conference on Programming Language Design and Implementation (PLDI)	2004, 2006–2008
European Conference on Parallel and Distributed Computing (Euro-Par)	2008
Information Technologies and International Development (ITID)	2009–2011
International Conf. on High-Performance Embedded Architectures and Compilers (HiPEAC)	2010
International Conference on Parallel Architecture and Compilation Techniques (PACT)	2006
International Conference on Supercomputing (ICS)	2002
International Conference on Arch. Support for Prog. Lang's and OS's (ASPLOS)	2004, 2006, 2008
International Conference on Human Computer Interaction (IndiaHCI)	2011
International Symposium on Computer Architecture (ISCA)	2007
International Symposium on Code Generation and Optimization (CGO)	2008
International Symposium on Microarchitecture (MICRO)	2001
International Symposium on Software Testing and Analysis	2008

Journal of Emerging Technologies in Computing Systems (JETC)	2010
Lab on a Chip (LOC)	2007
Object-Oriented Programming, Systems, Languages & Applications	2010
Software, Practice, and Experience	2010
Symposium on Principles and Practice of Parallel Programming (PPoPP)	2005
Symposium on Principles of Programming Languages (POPL)	2005, 2006, 2010
Symposium on User Interface Software and Technology (UIST)	2010, 2011
Transactions on Architecture and Code Optimization (TACO)	2005, 2010, 2011
Transactions on Computers	2009
Transactions on Design Automation for Embedded Systems (TDAES)	2009
Transactions on Embedded Computing Systems (TECS)	2007
Transactions on Parallel and Distributed Systems (TPDS)	2007
Workshop on Software Tools for Multi-Core Systems (STMCS)	2006