

# PRABAL DUTTA

JANUARY 1, 2009

## ADDRESS

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Computer Science Division  
University of California, Berkeley  
410 Soda Hall #1776  
Berkeley, California 94720

Tel: +1 (510) 495-4932  
Fax: +1 (510) 642-5775  
prabal@cs.berkeley.edu  
<http://www.cs.berkeley.edu/~prabal>

## EDUCATION

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**University of California, Berkeley**, Berkeley, CA (2004 – present)  
Ph.D. Candidate in Computer Science (degree expected summer 2009)  
Dissertation topic: “Design and Evaluation of a Low-Power Mobile Sensing Architecture”  
Advisors: David Culler and Scott Shenker

**The Ohio State University**, Columbus, OH (2002 – 2004)  
M.S. in Electrical Engineering  
Thesis: “On Random Event Detection in Wireless Sensor Networks”  
Advisors: Anish Arora and Steven Bibyk

**The Ohio State University**, Columbus, OH (1992 – 1997)  
B.S. in Electrical and Computer Engineering

## RESEARCH INTERESTS AND IMPACT

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I enjoy building novel embedded, networked, and distributed systems that enable new applications, explore new research directions, and have the potential for intellectual impact. My dissertation research envisions *mobile sensing* applications in which low-power, wireless sensors are carried by people, embedded in everyday things, or attached to vehicles, and explores the challenges that mobility raises. My graduate research has been commercialized by Aginova, Arch Rock, Crossbow and Moteiv, and is in use by hundreds of researchers and commercial customers worldwide.

## SUMMARY OF RESEARCH EXPERIENCE

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**University of California, Berkeley**, Berkeley, California  
*Graduate Student Researcher*, Computer Science Division (Aug. 2004 – present)  
*Microsoft Research Fellow*, Computer Science Division (Aug. 2008 – present)  
*National Science Foundation Fellow*, Computer Science Division (Aug. 2004 – Aug. 2007)

**Microsoft Research**, Redmond, Washington  
*Research Intern*, Networked Embedded Computing Group (Jun. 2004 – Aug. 2004)

**U.C. Berkeley (and Intel Research)**, Berkeley, California  
*Visiting Graduate Student*, Computer Science Division (Aug. 2003 – Dec. 2003)

**The Ohio State University**, Columbus, Ohio  
*Graduate Research Associate*, Computer & Info. Science (Apr. 2003 – Jun. 2004)  
*Research Assistant*, Advanced Robotics Lab, Mechanical Engineering (Sep. 1992 – Jun. 1995)  
*Research Assistant*, Artificial Intelligence Lab, Computer & Info. Science (Jul. 1994 – Dec. 1994)  
*High School Student*, Advanced Robotics Lab, Mechanical Engineering (Summer 1991)

## SUMMARY OF TEACHING EXPERIENCE

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### **University of California, Berkeley**, Berkeley, California

*Course Development Teaching Assistant*, Computer Science Division (Spring 2008)

*Graduate Student Instructor*, Computer Science Division (Fall 2005)

### **The Ohio State University**, Columbus, Ohio

*Graduate Teaching Associate*, Electrical Engineering (Sep. 2002 – Mar. 2003)

*Lecturer (Adjunct Faculty)*, Freshman Programs, College of Eng. (Apr. 2002 – Jun. 2002)

*Teaching Assistant*, Freshman Engineering Honors Program, College of Eng. (Feb. 1995 – Feb. 1997)

*Teaching Assistant*, Electrical Engineering (Oct. 1993 – May 1994)

## SUMMARY OF INDUSTRY EXPERIENCE

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### **Consultant**, San Francisco, California

*Arch Rock Corporation*, Research and Development (2006 – present)

*Targetcast Media*, Technical Advisory (2006 – present)

*Aginova, Inc.*, Research and Development (2006 – 2007)

### **NetEnabled, Inc.**, Columbus, Ohio

*Co-founder, Chairman and CEO*, Executive/Engineering Management (Jun. 1999 – Mar. 2002)

*Sole Proprietor*, d/b/a NetEnabled (May 1998 – Jun. 1999)

### **Bamboo Systems, Inc.**, Santa Clara, California

*Chief Technology Officer*, Engineering Management (Jun. 1997 – May 1998)

### **Consultant**, Columbus, Ohio

*ImageArray, LLC*, Engineering Management (2002 – 2003)

*Applied Innovation*, Research and Development (1998 – 1999)

*Lucent Technologies*, Switching and Networking Products (1997)

*Micrys, Inc.*, Engineering (1997)

### **Battelle Memorial Institute**, Columbus, Ohio

*Electrical Engineering Intern*, Product Development Group (Summer 1995, and some part-time after)

## AWARDS AND GRANTS

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Microsoft Research Graduate Fellowship, \$40,000 plus tuition (2008)

Design Contest Winner, ISLPED'08: Intl. Symp. on Low Power Electronics and Design, \$500 (2008)

Best Paper, IPSN'08: Seventh Intl. Conference on Information Processing in Sensor Networks (2008)

National Science Foundation Graduate Research Fellowship, \$90,000 plus tuition (2004 – 2007)

U.C. Berkeley Management of Technology China Fellowship, \$1,571 (2007)

Fellow, Berkeley Summer Institute for Preparing Future Faculty (2007)

Research Grant, Aginova, \$5,000 (2006)

Comdex Best of Show Award, Human Computer Interaction Device (Joystick), Las Vegas, NV (1997)

Full Tuition Scholarship, Ohio State University Minority Scholars Program (1992 – 1996)

Equipment Grant: Undergraduate Design Course, Motorola et al., \$53,000 (1995)

Presidential Leadership Citation, "In Recognition of Outstanding Leadership and Service to The Ohio State University and for Demonstrating Exceptional Dedication, Creativity, and Commitment to Quality" (1995)

Teaching Assistant, A robotics course identified by Motorola as a "University Success Story" (1994)

Winning Team, AAAI/IJCAI LEGO Mobile Robotics Competition, Seattle, WA (1994)

Third Place Grand Award, Intel International Science and Engineering Fair, "A Six-Legged Mobile Robot Based on a Reactive Approach to Robotic Architecture," Nashville, TN (1992)

Equipment Grant: A Six-Legged Mobile Robot Based on a Reactive Approach to Robotic Architecture, Philips/Signetix et al., \$75,000 (1992)

Central Ohio Science Student of the Year (1992)

## HONORS

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Eta Kappa Nu, Electrical Engineering Honor Society

Phi Kappa Phi, Academic National Honor Society

Tau Beta Pi, Engineering Honor Society (elected, but not inducted)

Upsilon Pi Epsilon, Computing Sciences Honor Society

## JOURNAL PUBLICATIONS

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1. Branislav Kusy, Prabal Dutta, Philip Levis, Miklos Maroti, Akos Ledeczi, and David Culler, "Elapsed Time on Arrival: A Simple and Versatile Primitive for Time Synchronization Services," *International Journal of Ad hoc and Ubiquitous Computing*, Vol. 2, No. 1, 2006.
2. A. Arora, P. Dutta, S. Bapat, V. Kulathumani, H. Zhang, V. Naik, V. Mittal, H. Cao, M. Gouda, Y. Choi, T. Herman, S. Kulkarni, U. Arumugam, M. Nesterenko, A. Vora, and M. Miyashita, "Line in the Sand: A Wireless Sensor Network for Target Detection, Classification, and Tracking," *Computer Networks Journal*, Elsevier, 2004. **2nd most downloaded article on Computer Networks from Jan - Dec, 2004.**

## CONFERENCE PUBLICATIONS

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1. Rodrigo Fonseca, Prabal Dutta, Philip Levis, and Ion Stoica, "Quanto: Tracking Energy in Networked Embedded Systems," In *Proceedings of the 8th USENIX Symposium on Operating Systems Design and Implementation (OSDI '08)*, Dec. 2008. **(26/193 = 13.5% acceptance rate)**
2. Prabal Dutta and David Culler, "Practical Asynchronous Neighbor Discovery and Rendezvous," In *Proceedings of the Sixth ACM Conference on Embedded Networked Sensor Systems (Sensys'08)*, Nov. 2008. **(25/153 = 16.3% acceptance rate)**
3. Prabal Dutta, Jay Taneja, Jaein Jeong, Xiaofan Jiang, and David Culler, "A Building Block Approach to Sensornet Systems," In *Proceedings of the Sixth ACM Conference on Embedded Networked Sensor Systems (SenSys'08)*, Nov. 2008. **(25/153 = 16.3% acceptance rate)**
4. Prabal Dutta, Mark Feldmeier, Jay Taneja, Joseph Paradiso, and David Culler, "Energy Metering for Free: Augmenting Switching Regulators for Real-Time Monitoring," In the International Symposium on Low Power Electronics and Design (ISLPED'08) Design Contest, Aug. 2008. **Design Contest Winner.**

5. Prabal Dutta, Mark Feldmeier, Joseph Paradiso, and David Culler, "Energy Metering for Free: Augmenting Switching Regulators for Real-Time Monitoring," In *Proceedings of the Seventh International Conference on Information Processing in Sensor Networks (IPSN'08) Track on Sensor Platforms, Tools, and Design Methods (SPOTS '08)*, Apr. 2008. **Best Paper Award.**
6. Sukun Kim, Rodrigo Fonseca, Prabal Dutta, Arsalan Tavakoli, David Culler, Philip Levis, Scott Shenker, and Ion Stoica, "Flush: A Reliable Bulk Transport Protocol for Multihop Wireless Networks," In *Proceedings of the Fifth ACM Conference on Embedded Networked Sensor Systems (SenSys'07)*, Nov. 2007. **(25/149 = 16.8% acceptance rate)**
7. Xiaofan Jiang, Prabal Dutta, David Culler, and Ion Stoica, "Micro Power Meter for Energy Monitoring of Wireless Sensor Networks at Scale," In *Proceedings of the Sixth International Conference on Information Processing in Sensor Networks (IPSN'07) Track on Sensor Platforms, Tools, and Design Methods (SPOTS '07)*, Apr. 2007.
8. Prabal K. Dutta, Jonathan W. Hui, David C. Chu, and David E. Culler, "Securing the Deluge Network Programming System," In *Proceedings of the Fifth International Conference on Information Processing in Sensor Networks (IPSN'06)*, Apr. 2006. **(41/165=24.8% acceptance rate)**
9. Prabal Dutta, Jonathan Hui, Jaein Jeong, Sukun Kim, Cory Sharp, Jay Taneja, Gilman Tolle, Kamin Whitehouse, and David Culler, "Trio: Enabling Sustainable and Scalable Outdoor Wireless Sensor Network Deployments," In *Proceedings of the Fifth International Conference on Information Processing in Sensor Networks Special track on Platform Tools and Design Methods for Network Embedded Sensors (IPSN/SPOTS'06)*, Apr. 2006.
10. Prabal K. Dutta, Anish K. Arora, and Steven B. Bibyk, "Towards Radar-Enabled Sensor Networks," In *Proceedings of the Fifth International Conference on Information Processing in Sensor Networks Special track on Platform Tools and Design Methods for Network Embedded Sensors (IPSN/SPOTS'06)*, Apr. 2006.
11. Kamin Whitehouse, Gilman Tolle, Jay Taneja, Cory Sharp, Sukun Kim, Jaein Jeong, Jonathan Hui, Prabal Dutta, and David Culler, "Marionette: Providing an Interactive Environment for Wireless Debugging and Development," In *Proceedings of the Fifth International Conference on Information Processing in Sensor Networks Special track on Platform Tools and Design Methods for Network Embedded Sensors (IPSN/SPOTS'06)*, Apr. 2006.
12. Prabal K. Dutta and David E. Culler, "System Software Techniques for Low-Power Operation in Wireless Sensor Networks," In *Proceedings of the 2005 International Conference on Computer-Aided Design, (ICCAD'05)*, Aug. 2005. **(Invited Paper)**
13. Anish Arora, Rajiv Ramnath, Emre Ertin, Prasun Sinha, Sandip Bapat, Vinayak Naik, Vinod Kulathumani, Hongwei Zhang, Hui Cao, Mukundan Sridharan, Santosh Kumar, Nick Seddon, Chris Anderson, Ted Herman, Nishank Trivedi, Chen Zhang, Mikhail Nesterenko, Romil Shah, Sandeep Kulkarni, Mahesh Aramugam, Limin Wang, Mohamed Gouda, Young-ri Choi, David Culler, Prabal Dutta, Cory Sharp, Gilman Tolle, Mike Grimmer, Bill Ferriera, Ken Parker, "ExScal: Elements of an Extreme Scale Wireless Sensor Network," In *Proceedings of the 11th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA 2005)*, 2005.
14. Prabal Dutta, Mike Grimmer, Anish Arora, Steve Bibyk, and David Culler, "Design of a Wireless Sensor Network Platform for Detecting Rare, Random, and Ephemeral Events," In *Proceedings of the Fourth International Conference on Information Processing in Sensor Networks (IPSN'05)*, Apr. 2005.
15. R.J. Freuler, M.J. Hoffman, T.P. Pavlic, J.M. Beams, J.P. Radigan, P.K. Dutta, J.T. Demel, and E.D. Justen, "Experiences with a Freshman Capstone Course - Designing, Building, and Testing Small Autonomous Robots," In *Proceedings of the 2003 American Society for Engineering Education Annual Conference & Exposition (ASEE'03)*, 2003.

16. A.W. Fentiman, J.T. Demel, R. Boyd, K. Pugsley, P. Dutta, "Helping Students Learn to Organize and Manage a Design Project," In *Proceedings of the American Society for Engineering Education Annual Conference (ASEE'96)*, 1996.

#### WORKSHOP PUBLICATIONS

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1. Prabal Dutta, Razvan Musaloiu-E., Ion Stoica, and Andreas Terzis, "Wireless ACK Collisions Not Considered Harmful," In *Proceedings of the Seventh Workshop on Hot Topics in Networks (HotNets-VII)*, Calgary, Alberta, Canada, Oct. 6-7, 2008. **(22/110 = 20% acceptance rate)**
2. Prabal Dutta, David Culler, and Scott Shenker, "Procrastination Might Lead to a Longer and More Useful Life," In *Proceedings of the Sixth Workshop on Hot Topics in Networks (HotNets-VI)*, Nov. 14-15, 2007. **(22/124 = 17.7% acceptance rate)**
3. Arsalan Tavakoli, Prabal Dutta, Jaein Jeong, Sukun Kim, Jorge Ortiz, Phil Levis, and Scott Shenker, "A Modular SensorNet Architecture: Past, Present, and Future Directions," In *Proceedings of the International Workshop on Wireless Sensor Network Architecture (WSNA'07)*, Apr. 2007.
4. Xiaofan Jiang, Jay Taneja, Jorge Ortiz, Arsalan Tavakoli, Prabal Dutta, Jaein Jeong, David Culler, Philip Levis, and Scott Shenker, "An Architecture for Energy Management in Wireless Sensor Networks," In *Proceeding of the International Workshop on Wireless Sensor Network Architecture (WSNA'07)*, Apr. 2007.
5. Kannan Srinivasan, Prabal Dutta, Arsalan Tavakoli, and Philip Levis, "Some Implications of Low Power Wireless to IP Networking," In *Proceedings of the Fifth Workshop on Hot Topics in Networks (HotNets-V)*, Nov. 2006. **(23/114 = 20.2% acceptance rate)**
6. Froemke, R.C., Wachs, M., Chen, Z., Dutta, P., Myers, G., Glassner, G., Schreiner, C.E., Merzenich, M.M., and Levis, P.A., "A wireless device for combined subcortical stimulation and cortical recording," In *The 4th Annual National Academies Keck Futures Initiatives on Smart Prosthetics: Exploring Assistive Devices for the Body and the Mind*, Irvine, CA, 2006.
7. Janos Sallai, Branislav Kusy, Akos Ledeczki, and Prabal Dutta, "On the Scalability of Routing Integrated Time Synchronization," In *Proceedings of the 3rd European Workshop on Wireless Sensor Networks (EWSN'06)*, Feb. 2006. **(21/133 = 15.8% acceptance rate)**
8. David Culler, Prabal Dutta, Cheng Tien Ee, Rodrigo Fonseca, Jonathan Hui, Philip Levis, Joseph Polastre, Scott Shenker, Ion Stoica, Gilman Tolle, Jerry Zhao, "Towards a Sensor Network Architecture: Lowering the Waistline," In *Proceedings of HotOS X: Tenth Workshop on Hot Topics in Operating Systems*, Jun. 2005. **(24/123 = 19.5% acceptance rate)**

#### TECHNICAL REPORTS

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1. Kannan Srinivasan, Prabal Dutta, Arsalan Tavakoli, and Philip Levis, "An Empirical Study of Low Power Wireless," Stanford Information Networks Group Technical Report, SING-08-03, Oct. 2008.
2. Sukun Kim, Rodrigo Fonseca, Prabal Dutta, Arsalan Tavakoli, David Culler, Philip Levis, Scott Shenker and Ion Stoica, "Flush: A Reliable Bulk Transport Protocol for Multihop Wireless Networks," Technical Report No. UCB/Eecs-2006-169, Eecs Department, University of California, Berkeley, December 12, 2006.
3. Kannan Srinivasan, Prabal Dutta, Arsalan Tavakoli, and Philip Levis, "Understanding the Causes of Packet Delivery Success and Failure in Dense Wireless Sensor Networks," Stanford Information Networks Group Technical Report SING-06-00, 2006.

4. Prabal K. Dutta, Jonathan W. Hui, David C. Chu and David E. Culler, "Towards Secure Network Programming and Recovery in Wireless Sensor Networks," Technical Report No. EECS-2005-7, EECS Department, University of California, Berkeley, 2005.
5. A. Arora, P. Dutta, S. Bapat, et.al, "Line in the Sand: A Wireless Sensor Network for Target Detection, Classification, and Tracking," The Ohio State University Technical Report OSU-CISRC-12/03-TR71, 2003.
6. Prabal K. Dutta and Anish K. Arora, "Integrating Micropower Impulse Radar and Motes," The Ohio State University Technical Report OSU-CISRC-12/03-TR67, 2003.
7. Prabal K. Dutta and Anish K. Arora, "Sensing Civilians, Soldiers, and Cars," The Ohio State University Technical Report OSU-CISRC-12/03-TR66, 2003.

## BOOK CHAPTERS

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1. S.V. Sreenivasan, P.K. Dutta, K.J. Waldron, "The Wheeled Actively Articulated Vehicle (WAAV): An Advanced Offroad Mobility Concept," *Advances in Robot Kinematics and Computational Geometry*, J. Lenarcic, B. Ravani, Eds., Kluwer Academic Publishers, 1994.

## POSTERS AND DEMOS

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1. Xiaofan Jiang, Stephen Dawson-Haggerty, Jay Taneja, Prabal Dutta, and David Culler, "Demo: Creating Greener Homes with IP-Based Wireless AC Energy Monitors," In *Proceedings of the Sixth ACM Conference on Embedded Networked Sensor Systems (SenSys'08)*, Nov. 5-7, 2008.
2. Prabal Dutta and David Culler, "Demo: Are We There Yet? Can You Hear Me Now? Applications of Asynchronous Neighbor Discovery," In *Proceedings of the Sixth International Conference on Mobile Systems, Applications, and Services (Mobisys'08)*, Jun. 2008.
3. Prabal Dutta and David Culler, "Demo: Epic: An Open Mote Platform for Application-Driven Design," In *Proceedings of the Seventh International Conference on Information Processing in Sensor Networks (IPSN'08) Track on Sensor Platforms, Tools, and Design Methods (SPOTS '08)*, Apr. 2008.
4. Prabal Dutta, David Culler, and Scott Shenker, "Demo: Asynchronous Neighbor Discovery: Finding Needles of Connectivity in Haystacks of Time," In *Proceedings of the Seventh International Conference on Information Processing in Sensor Networks (IPSN'08) Track on Sensor Platforms, Tools, and Design Methods (SPOTS '08)*, Apr. 2008.
5. Kannan Srinivasan, Prabal Dutta, Arsalan Tavakoli, and Philip Levis, "Poster: Understanding the Causes of Packet Delivery Success and Failure in Dense Wireless Sensor Networks," In *Proceedings of the ACM Conference on Sensor Systems (Sensys'06)*, Nov., 2006.
6. Prabal K. Dutta, Jonathan W. Hui, David C. Chu, and David E. Culler, "Poster: Securing the Deluge Network Programming System," In *Proceedings of the Fifth International Conference on Information Processing in Sensor Networks (IPSN'06)*, Apr., 2006.
7. David Culler, Prabal Dutta, Cheng-Tien Ee, Rodrigo Fonseca, Jonathan Hui, Philip Levis, Joseph Polastre, Scott Shenker, Ion Stoica, Gilman Tolle, Jerry Zhao, "Poster: Towards a Network Architecture for SensorNets," NSF NOSS PI Meeting, Harvard University, Cambridge, MA, Oct. 17, 2005.
8. "Demo: Networked Embedded Computing," Microsoft Research Faculty Summit, Redmond, WA, Aug., 2004.
9. "Demo: Improving Life and Industry with Wireless Sensors," U.S. Congress, Washington, D.C., Mar., 2004.

10. "Demo: Line in the Sand: MacDill AFB Demonstration," MacDill AFB, Tampa, FL, Aug., 2003.
11. "Poster: Line in the Sand: A Case Study in Sensor Networks," Networked Embedded Systems Technology (NEST) Retreat, University of California Berkeley, Jun., 2003.

#### SELECTED MEDIA COVERAGE

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- "5 Cool Wireless Research Projects," *Slashdot*, Nov. 11, 2007.
- "5 Cool Wireless Research Projects Worth Checking Out," *Network World*, Nov. 8, 2007.
- "A Nest of Sensors," *Berkeley Engineering Lab Notes*, Vol 5(9), Oct. 2005.
- "Tripwires Get Smart," *News In Engineering*, The Ohio State Univ. College of Eng., Autumn 2003.
- "OSU Researchers test 'smart dust'," National Public Radio, WOSU News, Sep. 9, 2003.
- "Military Research," WSYX News (ABC Affiliate), Sep. 8, 2003.
- "Military Technology," WBNS News (CBS Affiliate), Sep. 8, 2003.
- "Around Ohio: Military Research," Ohio News Network, Sep. 8, 2003.
- "Ohio State smart dust event draws 'a line in the sand'," The Ohio State Univ. Press Release, Sep. 5, 2003.
- "Tiny Sensors Detect Intruders," The Ohio State Univ. College of Eng. Press Release, Sep. 2, 2003.
- "Web-Based Monitoring & Control For Oil/Gas Industry," *Pipeline and Gas Jnl.*, Pg. 20, Mar. 2001.
- "Connecting Everyday Machines to the 'Net,'" *High Tech Careers*, Jun. 1999.
- "Cyberstick: Best Toy of Show" (COMDEX), *PC Week Magazine*, ZDNet, Nov. 30, 1997.
- "With work - and luck - they hoped to engineer a champ", *The Columbus Disp.*, Pg. 1C, May 26, 1995.
- "Students Strive for Strong Showings in Competitions," *News In Engineering* (cover), The Ohio State University College of Eng, Autumn 1994.
- "Robot Olympics shows off machines' growing abilities," *Seattle Times*, Pg. D1, Aug. 2, 1994.

#### TALKS AND LECTURES

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1. "Quanto: Tracking Energy in Networked Embedded Systems," OSDI'08, Dec. 10, 2008.
2. "Tracking Energy in Networked Embedded Systems," MIT CSAIL (Dec. 5, 2008), Harvard University EECS Dept. (Dec. 4, 2008), University of Washington CSE Dept. (Nov. 19, 2008).
3. "A Building Block Approach to Sensornet Systems," Sensys'08, Nov. 7, 2008.
4. "Practical Asynchronous Neighbor Discovery and Rendezvous for Mobile Sensing Applications," Sensys'08, Nov. 5, 2008.
5. "Wireless ACK Collisions Not Considered Harmful," HotNets-VII, Oct. 6, 2008.
6. "Energy Metering for Free: Augmenting Switching Regulators for Real-Time Monitoring," IPSN'08, Apr. 23, 2008.
7. "Procrastination Might Lead to a Longer and More Useful Life," HotNets-VI, Nov. 14, 2007.

8. "Musings on an Operating System Abstraction for Sensor Sampling," DB Lunch, U.C. Berkeley, Feb. 16, 2007.
9. "Procrastination Can Lead to a Longer and More Useful Life," Guibas/Levis Research Group, Stanford University, Dec. 1, 2006.
10. "Media Access Control," Guest Lecturer for CS344A: Sensor Network Systems, Stanford University, May 9, 2006.
11. "Trio: Enabling Sustainable and Scalable Outdoor Wireless Sensor Network Deployments," IPSN/SPOTS'06, Apr. 21, 2006.
12. "Towards Radar-Enabled Sensor Networks," IPSN/SPOTS'06, Apr. 21, 2006.
13. "NESTFE: Large-Scale, Long-Lived, Outdoor Testbeds Supporting Systems Research," Microsoft Research Sensor Networks Workshop (MSRSNW'05), Woodinville, WA, Oct. 10, 2005.
14. "Trio: OEP3 Technology and Deployment," DARPA NEST PI Meeting, Aug. 29, 2005.
15. "Secure Network Programming," Dust Networks, Jun. 16, 2005.
16. "Systems and Networking Research in Sensornets at UC Berkeley: Pushing Scale, Lifetime, Accessibility, Reliability, and Modularity," ETH Zürich, Zürich, Feb. 17, 2006.
17. "Trio: NEST Final Experiment Hardware Platform," CENTS Retreat, May 27, 2005.
18. "Design of a Wireless Sensor Network Platform for Detecting Rare, Random, and Ephemeral Events," IPSN'05, Apr. 27, 2005.
19. "DataForge, A SourceForge for Datasets: Preserving and Sharing Experimental Data," U.C. Berkeley NEST Retreat, Jan. 13, 2005.
20. "Robustness," U.C. NEST Retreat, Jan. 13, 2005.
21. "Kansei: Motivation and Genesis of a Robotic Sensor Network Testbed," DARPA NEST PI Meeting, The Ohio State University, May 1, 2004.
22. "MobiLoc: Mobility Enhanced Localization," U.C. Berkeley NEST Retreat, Jan., 2004.
23. "Security Considerations in Wireless Sensor Networks," Sensors Expo, San Jose, CA, May, 2002.

## PATENTS

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1. U.S. Patent Application: "System and Method for Detecting a Proactive Device has Limited or Interrupted Current it Carries", Prabal Dutta, Wei Hong, David Culler, and Malay Thakar, 2008 (from consulting work at Arch Rock).
2. U.S. Patent Application: "System and Method for Dispatching a Technician to a Protective Device", Prabal Dutta, Wei Hong, David Culler, and Malay Thakar, 2008 (from consulting work at Arch Rock).
3. U.S. Patent Application: "Method and Apparatus for Managing Power Distribution Equipment Using Remote Data Collection", Prabal Dutta, David Culler, Wei Hong, and Malay Thakar, 2007 (from consulting work at Arch Rock).
4. U.S. Patent Application: "System and Method for Distributed Control of Unrelated Devices and Programs", Prabal Dutta and Charles McManis, 2002 (from technical work at NetEnabled).
5. U.S. Patent Application: "System and Method for On-Demand Communications with Legacy Networked Devices", Prabal Dutta, 2001 (from technical work at NetEnabled).

## SERVICE

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Chair, CSGSA Faculty Candidate Evaluation Committee, UCB Computer Science Div. (2008)

Reviewer: ACM SOSP (2007), ACM TOSN (2006, 2007, 2008), ACM Sensys (2003, 2004, 2006, 2007, 2008), ACM CCS (2007), IEEE IPSN (2006), IEEE SPOTS (2006, 2008), IEEE PerSec (2005), DCOSS (2005), and ACM WSNA (2003, 2007)

Member, Shadow Program Committee, Symposium on Operating System Principles (SOSP) (2007)

Member, CSGSA Faculty Candidate Evaluation Committee, UCB Computer Science Div. (2007)

Member, TinyOS 2.0 Storage Working Group (2007)

Member, TinyOS 2.0 Core Working Group (2005 - present)

Member, Graduate Admissions Committee, UCB Computer Science Div. (2006)

Mentor, 1<sup>st</sup>-year Graduate Students: Xiofan Jiang (NSF Fellowship winner), Jay Taneja (NDSEG Fellowship winner), and Arsalan Tavakoli (NSF Fellowship Honorable Mention) (2005 - 2007)

Co-organizer, Systems Lunch, U.C. Berkeley Computer Science Division (2005 - 2006 academic year)

Member, Search Committee, Dean of the College of Engineering, The Ohio State Univ. (2003 - 2004)

Working Group, IEEE P1451.5 Wireless Sensor Interfaces (2001 - 2002)

Judge, Freshman Engineering Honors Robotics Competition, The Ohio State Univ. (1999 - 2001)

University Honors Ambassador, The Ohio State University (1994 - 1997 academic years)

President, Honors Community Association, The Ohio State University (1994 - 1995 academic year)

Editor, *The Delegate Reporter*, Honors Ambassadors Program, The Ohio State University (1994)

President, Lincoln House Student Council, The Ohio State University (1993 - 1994 academic year)

## PROFESSIONAL SOCIETY MEMBERSHIPS

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Association for Computing Machinery (2002 - present)

USENIX Advanced Computing Technical Association (2006 - present)

Institute of Electrical and Electronics Engineers (2002 - 2006)

## DETAILS OF CONSULTING EXPERIENCE

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1. **Arch Rock.** Developed the company's embedded (mote) platform architecture, designed many of the company's hardware products, and was co-inventor on three patent applications.
2. **TargetCast Media.** Advise company on technology strategy, technical staffing, system architecture, performance analysis, wireless networking.
3. **Aginova.** Advised company on wireless sensor network technology, low-power wireless protocols, platform architecture, energy metering.
4. **ImageArray.** Led software engineering, developed distributed algorithms, and helped architect the system/network software and hardware platform.
5. **Micrys, Inc.** Developed the original prototype of a Nintendo "Wii-like" joystick that won the Comdex 1997 "Best of Show" award.

## DETAILS OF TEACHING EXPERIENCE

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1. **UCB CS 194-5: The Internet of Everyday Things** (Spring 2008)  
I helped develop the course materials, designed the hardware, and helped teach this design studio. Students learned about embedded systems, networking, hardware, sensors, and web applications in this hands-on course. Student projects included a Google Maps/Nordic Trac Cyber-Physical Mashup, Web-Enabled Coffee Pot, and a Smart Refrigerator. Co-taught with Jonathan Hui and David Culler.
2. **UCB CS 294-11/CS 298-41: Graduate Seminar on Sensor Actuator Networks** (Fall 05)  
I co-organized this course with David Chu, Joe Hellerstein, and David Culler. I developed the course structure, selected many of the readings, helped groups formulate and carry out their research projects, and recruited many of the guest speakers. Guests included Sam Madden (MIT), Ramesh Govindan (USC), Deepak Ganesan (UMass), Jose Gutierrez (Eaton Corp), Feng Zhao (Microsoft Research), Carlos Guestrin (CMU), David Gay (Intel Research), Tarek Abdelzaher (UIUC), Joe Polastre (Moteiv Corporation), and Phil Levis (Stanford).
3. **OSU EE 682: Group Project for Electrical and Computer Engineering Design II** (Wi 03)  
GTA for one section of the department's second senior design course which teaches teamwork and engineering design. I helped the teams transition their designs to actual systems. I participated in status meetings and design reviews, provided guidance on risk mitigation, and helped the teams remain cohesive and focused in the face of pending deadlines, out-of-stock parts, and buggy software.
4. **OSU EE 582: Electrical and Computer Engineering Design I** (Au 02)  
GTA for two sections of the department's first senior design course which teaches teamwork and communications. I helped student teams define their senior design projects, provided guidance on what could be accomplished in the time frame available, taught students to write effectively in a business context, and graded writing assignments and design papers.
5. **OSU ENG H168: Fundamentals of Engineering for Honors Capstone Course** (Sp 02)  
As a lecturer, I was responsible for team-teaching a class of 32 students how to design and build a fully-autonomous mobile robot capable of navigating a model apple orchard and picking apples from trees on three different levels while avoiding three other robots attempting to do the same. The class was one of eight similarly-sized sections and was divided into eight teams of four students each. The curriculum covered teamwork, conflict resolution, project management, decision-making, progress reports, brainstorming, scenario analysis, mechanical design, sensor/motor electronics, software engineering, and a head-to-head contest held in public venue. This course is the permanent incarnation of what originally started as EE 294 and then became ENG 194.05 (see below).
6. **OSU ENG 194.05 Gateway Engineering Capstone Course** (Sp 95, Au 95, Sp 96, Au 96)  
I raised \$53,000 in equipment grants from Motorola, Panasonic, Sharp, SGS Thomson, AMP, and others to support this hands-on engineering course for first-year engineering students. I worked with Professor John Demel and the NSF-funded Gateway Project personnel to transform the OSU EE 294 experimental group studies course (Wi 94) that I had conceived into this freshman-level course and competition. This work led to two papers on engineering education. *The lasting contribution of this effort is a robotics design course that today is the capstone of the freshman engineering honors curriculum. This course now educates about 250 students per year at Ohio State – representing approximately 25% of all first year engineering students.*
7. **OSU EE 294: Group Studies in Electrical Engineering** (Wi 94)  
I conceived and organized this robot design course and competition, obtained the Department of Electrical Engineering's backing, recruited faculty to teach, and served as a teaching assistant. The course was featured by Motorola as a 1994 "University Success Story."

## DETAILS OF INDUSTRY EXPERIENCE

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### 1. **NetEnabled, Inc.**

- NetEnabled developed and marketed embedded internetworking hardware, software, and services enabling organizations to monitor and control their remote assets.
- Responsible for driving the company's vision and mission, implementing its strategic goals. Developed the company's competitive strategy and negotiated strategic alliances and financing. Authored the company's business plan.
- Grew revenues from \$0 to nearly \$2 million through direct sales efforts. Grew customer base from 0 to 15 firms. Drove the adoption of Miller Heiman's Strategic Selling methodology before recruiting and hiring an industry veteran Vice President of Sales to drive continued growth in our target market segments in June 2001.
- While acting in the role of VP of Engineering (Jan 2000 – May 2000, Oct 2000 – Feb 2001), managed six simultaneous hardware and software projects and drove the adoption of the Rational Unified Process framework. Adoption resulted in CMM Level 2, with institutionalized key process areas including: requirements management, project planning, project tracking, subcontract management, quality assurance, and configuration management.
- Recruited and hired a Silicon Valley veteran of Apple and Sun Microsystems as Director of Engineering to manage ongoing product development efforts in March 2001.
- Previously, as a sole proprietorship, was an independent contractor serving Applied Innovation, Inc., a company that develops, manufactures, and markets telecommunications network management hardware, software, and services to major telecommunications and datacommunications network operators.
- Co-developed NEWEB, a web-based management system for telecommunications networks. Initially worked closely with the Director of Research to develop the product prototype and then participated as a member of the engineering team that created the product. Contributed to the product's architecture and developed the product's security model, search model, licensing system, and significant portions of the database system.

### 2. **Bamboo Systems, Inc.**

- Bamboo Systems developed sales force automation software for increasing sales and improving the frequency and quality of meaningful customer contact for the brokerage industry.
- Conceived, designed, and implemented the company's overall technology strategy and architecture. Successfully integrated diverse technologies to create a web-based sales force automation product for brokerage industry.

### 3. **Battelle Memorial Institute.**

- Part of the 75-person team that developed SmartCard-based banking systems that are being used today for stored-value credit/debit systems at numerous universities and government agencies. Battelle eventually spun-out the technology under the CyberMark name.
- Specified, evaluated, and recommended various biometric sensors for inclusion in client projects.

REFERENCES

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**David Culler**

Professor, ACM Fellow, NAE Member  
Computer Science Division  
University of California, Berkeley  
Soda Hall #1776  
Berkeley, CA 94720-1776  
culler@cs.berkeley.edu  
+1 (510) 643-7572

**Ion Stoica**

Associate Professor  
Computer Science Division  
University of California, Berkeley  
Soda Hall #1776  
Berkeley, CA 94720-1776  
istoica@cs.berkeley.edu  
+1 (510) 643-4007

**Anish Arora**

Professor, IEEE Fellow  
Dept. of Computer Science and Eng.  
The Ohio State University  
395 Dreese Laboratory  
2015 Neil Ave  
Columbus, OH 43210-1277  
anish@cse.ohio-state.edu  
+1 (614) 292-1836

**Joseph Paradiso**

Associate Professor  
The Media Laboratory  
Massachusetts Institute of Technology  
20 Ames St, E15-327  
Cambridge, MA 02139-4307  
joep@media.mit.edu  
+1 (617) 253-8988

**Scott Shenker**

Professor, ACM Fellow, IEEE Fellow  
Computer Science Division  
University of California, Berkeley  
Soda Hall #1776  
Berkeley, CA 94720-1776  
shenker@cs.berkeley.edu  
+1 (510) 643-3043

**Kristofer Pister**

Professor  
EECS Department  
University of California, Berkeley  
497 Cory Hall  
Berkeley, CA 94720-1770  
pister@eecs.berkeley.edu  
+1 (510) 643-9268

**Steven Bibyk**

Associate Professor  
Dept. of Electrical and Computer Eng.  
The Ohio State University  
205 Dreese Laboratory  
2015 Neil Ave  
Columbus, OH 43210-1272  
bibyk@ece.ohio-state.edu  
+1 (614) 292-1300

**John Stankovic**

Professor, ACM Fellow, IEEE Fellow  
Department of Computer Science  
University of Virginia  
151 Engineer's Way, P.O. Box 400740  
Charlottesville, VA 22904-4740  
stankovic@cs.virginia.edu  
+1 (434) 982-2275