

Nilanjan Banerjee

Associate Professor, University of Maryland Baltimore County

Education

- 2007-2009 **Ph.D. in Computer Science**, *University of Massachusetts*, Amherst, Yahoo! Outstanding Dissertation Award.
- 2004-2007 **M.S. in Computer Science**, *University of Massachusetts*, Amherst, Ph.D. candidature with distinction.
- 2000-2004 **BTech (Hons.) in Computer Science**, *Indian Institute of Technology*, Kharagpur, Best Undergraduate Thesis Award.

Experience

- 2015-present **Associate Professor of Computer Science**, *University of Maryland*, Baltimore County.
- 2012-2015 **Assistant Professor of Computer Science**, *University of Maryland*, Baltimore County.
- 2009-2012 **Assistant Professor of Computer Science**, *University of Arkansas*, Fayetteville.
- 2008 **Research Intern**, *Microsoft Research*, Redmond.
- 2007 **Research Intern**, *Intel Research*, Berkeley.
- 2003 **Research Intern**, *University of Dortmund*, Germany.

Honors Received

- 2015 University Nominee for Blavatnik Young Scientist Award
- 2015 UMBC Up and Coming Inventor
- 2015 Best Demonstration Runner-up, IEEE PerCom 2015
- 2013 Microsoft Research Software Engineering Innovations Award
- 2012 Best Paper Nomination, ACM BuildSys 2012
- 2011 National Science Foundation CAREER Award
- 2011 National Science Foundation I-Corp Award for Entrepreneurship (first group of awardee)
- 2011 Finalist: ORAU Ralph E. Powe Junior Faculty Enhancement Awards
- 2011 Best Paper Award, ACM Sigcomm Workshop on Home Networks
- 2011 Outstanding Researcher Award, College of Engineering
- 2009 Yahoo! Outstanding Dissertation Award
- 2008-09 UMass Graduate School Fellowship
- 2007 Ph.D. Candidacy with Distinction, UMass Amherst
- 2004 Best Undergraduate Thesis Award, IIT Kharagpur

Selected Publications as tenure-track professor (h-index=17, i-index=21)

- 2016 H. Khan, R. Kukkapali, P. Waranpande, S. Kulandaival, **N. Banerjee**, N. Roy, R. Robucci, RAM: Radar based Activity Recognition, IEEE Infocom, 2016 [Acceptance Rate: 18%].

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- 2015 A. Nelson, G. Singh, R. Robucci, C. Patel, **N. Banerjee**, Adaptive and Personalized Gesture Recognition using Flexible Textile Sensor Arrays, *IEEE Transactions in Multi-scale Computing*, 2015
- 2015 G. Singh, T. A. Chen, R. Robucci, C. Patel, **N. Banerjee**, distracted : Real-time Impaired Driving Detection Using Textile Sensors, *IEEE Sensors Journal* 2015 [Impact Factor: 1.85]
- 2015 S. Bobovych, A. Matthews, **N. Banerjee**, J. Parkerson, R. Robucci, C. Patel, perpetuu: A Tiered Solar-powered GIS Microserver, *ACM Transactions on Embedded Computing Systems*, 2015, [Impact factor: 1.2]
- 2015 M. Rahman, B. Blackwell, **N. Banerjee**, D. Saraswat, Weed Infestation Identification Using Hierarchical Crowdsourcing, *Computers and Electronics in Agriculture*, Elsevier, 2015 [Impact Factor: 1.99] (Inter-disciplinary between CS and Agricultural Sciences).
- 2015 M. Law, S. Rollins, **N. Banerjee**, A. Joshi, Visualization-assisted Insights into Home Energy Usage The EG/VGTC Conference on Visualization (EuroVis 2015) [Acceptance Rate: 40%].
- 2015 M. Skaggs, S. Rao, R. Robucci, **N. Banerjee**, C. Patel, Transient Current Estimation using S3C (Standard Cell Current Transient Characterization), 19th International Symposium on VLSI Design and Test, 2015 [Acceptance Rate: 29%].
- 2015 S. Bobovych, J. Parkerson, **N. Banerjee**, R. Robucci, C. Patel, J. Schmandt, SunaPlayer: High-Accuracy Emulation of Solar Cells, 14th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN 2015) [Acceptance Rate: 24%]
- 2015 Z. Li, R. Robucci, **N. Banerjee**, C. Patel. Tongue-n-Cheek : Non-contact Tongue Gesture Recognition, 14th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN 2015) [Acceptance Rate: 24%].
- 2015 G. Singh, A. Nelson, R. Robucci, C. Patel, **N. Banerjee**, Inviz: Low-power Personalized Gesture Recognition Using Wearable Textile Capacitive Sensor Arrays, *IEEE International Conference on Pervasive Computing and Communications (PerCom 2015)* [Acceptance Rate: 7.5%]
- 2015 R. Baldwin, S. Bobovych, R. Robucci, **N. Banerjee**, C. Patel, Gait Analysis for Fall Prediction Using Hierarchical Textile-based Capacitive Sensor Array, *IEEE/ACM Design Automation and Test in Europe (DATE 2015)* [Acceptance Rate:15%].
- 2015 S. Rao, H. Josphipura, D. KrishnanKutty, R. Robucci, **N. Banerjee**, C. Patel, Assessing Security by Estimating Power Supply Fluctuation, *IEEE International Symposium on Hardware-Oriented Security and Trust (HOST 2015)* [Acceptance Rate: 56%]
- 2014 D. Lachut, **N. Banerjee**, S. Rollins. Predictability of Home Energy Usage, 5th IEEE Conference on Green Computing (IGCC 2014) [AR: 36%]
- 2014 S. Rollins, **N. Banerjee**, L. Choudhury, D. Lachut, A System for Collecting Activity Annotations for Home Energy Management, *Pervasive and Mobile Computing*, Elsevier 2014 [Impact Factor: 1.63]
- 2014 S. Rollins, **N. Banerjee**, Using Rule Mining to Understand Appliance Energy Consumption Patterns, 12th *IEEE International Conference on Pervasive Computing and Communications (PerCom) 2014*, [Acceptance Rate: 10.8%].
- 2014 G. Irwin, **N. Banerjee**, A. Hurst, S. Rollins, Understanding Context Governing Home Energy Consumption, *ACM Conference on Human Factors in Computing Systems (CHI 2014)* [Acceptance Rate: 49%].
- 2013 W. Johnston, **N. Banerjee**, J. Cothren, J. P. Parkerson, Information-rich GIS Dissemination in Disconnected Environments, *Transactions in GIS*, Wiley, Vol. 18, Issue 4, pages: 555-573, 2013 [Impact factor: 0.91](Inter-disciplinary between CS and Geosciences)

- 2013 A. Nelson, J. Schmandt, W. Wilkins, J. Parkerson, **N. Banerjee**, System Support for Micro-Harvester powered Mobile Sensing, 34th IEEE Real Time Symposium 2013 (RTSS 2013), [Acceptance Rate: 22%]
- 2013 A. Nelson, J. Schmandt, P. Kumar, W. Wilkins, D. Lachut, **N. Banerjee**, S. Rollins, James P. Parkerson, V. Varadan Wearable Multi-sensor Gesture Recognition in Assistive Devices for Paralysis Patients , IEEE Sensors 2013 [Acceptance Rate: 35%].
- 2012 D. Lachut, L. Choudhury, K. Moran, S. Piel, Y. Xiong, **N. Banerjee**, S. Rollins Minimizing Intrusiveness in Home Energy Measurement, ACM BuildSys 2012, **Best Paper Nomination**, [Acceptance Rate: Top 11%].
- 2011 R. Kumar, **N. Banerjee**, Multiobjective Network Topology Design, Applied Soft Computing, Elsevier, 2011 [Impact factor: 2.05]
- 2011 **N. Banerjee**, S. Rollins, K. Moran, Automating Energy Management in Green Homes, ACM Sigcomm Computer Communications Review, pp: 19-24, 2011 [Impact Factor: 1.0]
- 2011 V. K. Varadan, P. S. Kumar, P. Rai, **N. Banerjee**, R. E. Harbaugh, S. Oh, H. Kwon, e-Nanoflex Sensor System: Smartphone-based Roaming Health Monitor, ASME Journal of Nanotechnology in Engineering and Medicine 2(1), 011016, February 2011 (Inter-disciplinary between CS and Material Science)
- 2011 H. Soroush, P. Gilbert, **N. Banerjee**, B. N. Levine, M. D. Corner, Landon Cox, Concurrent Wi-Fi for Mobile Users: Analysis and Measurements, ACM 7th International Conference on emerging Networking EXperiments and Technologies (CoNEXT) [Acceptance Rate: 19%]
- 2011 **N. Banerjee**, S. Rollins, K. Moran, Automating Energy Management in Green Homes, ACM Sigcomm HomeNets 2011, **Best Paper Award**, [Acceptance Rate: top 7%]
- 2011 H. Soroush, P. Gilbert, **N. Banerjee**, M. Corner, B. Levine, L. Cox, Spider: Improving Mobile Networking with Concurrent Wi-Fi Connections, ACM Sigcomm 2011 [Acceptance Rate: 28%]
- 2010 **N. Banerjee**, S. Agarwal, P. Bahl, R. Chandra, A. Wolman, M. D. Corner, Virtual Compass: Relative positioning to sense mobile social interactions, Eighth International Conference on Pervasive Computing (Pervasive 2010), **Best Paper Nomination** [Acceptance Rate: 23%]
- 2010 **N. Banerjee**, M. D. Corner, B. N. Levine, Design and field experimentation of an energy-efficient architecture for DTN throwboxes, IEEE/ACM Transactions on Networking, Volume 18, Issue 2, pp: 554-567, April 2010 [Impact factor: 2.28].
- 2009 H. Soroush, **N. Banerjee**, A. Balasubramanian, M. D. Corner, B. N. Levine, B. Lynn. DOME: A Diverse Outdoor Mobile Testbed, ACM International Workshop on Hot Topics of Planet-scale Mobility Measurements (HotPlanet 2009) [Acceptance Rate: 38%].
- 2008 **N. Banerjee**, M. D. Corner, D. Towsley, B. N. Levine, Relays, Meshes, and Basestations: Enhancing Mobile Networks with Infrastructure, ACM MobiCom 2008, San Francisco, [AR: 11%].
- 2007 N. Banerjee, A. Rahmati, M. D. Corner, S. Rollins, L. Zhong, Users and Batteries: Interactions and Adaptive Energy Management in Mobile Systems, ACM Ubicomp 2007, Innsbruck [AR: 19%].
- 2007 N. Banerjee, J. Sorber, M. D. Corner, S. Rollins, D. Ganesan, Triage: Balancing Energy Consumption and Quality of Service in a Microserver, ACM MobiSys 2007, Puerto Rico, [AR: 20.9%].
- 2007 N. Banerjee, M. D. Corner, B. N. Levine, An Energy-Efficient Architecture for DTN Throwboxes, IEEE Infocom 2007, Anchorage, [AR: 18%].
- 2007 N. Banerjee, R. Kumar, Multiobjective Network Design for Realistic Traffic Models, ACM SigEVO Genetic and Evolutionary Computations Conference, 2007 **Best Paper Nomination**, [AR: top 10%].

- 2006 R. Kumar, N. Banerjee, Analysis of a Multiobjective Evolutionary Algorithm on the 0-1 Knapsack problem, Theoretical Computer Science, Elsevier, 358(1), 104-120, July 2006 [Impact factor: 0.65]
- 2005 S. Ghosh, R. Kumar, N. Banerjee, R. Datta, Multihop Virtual Topology Design in WDM Networks for Self Similar Traffic, Photonic Network Communications, Springer, 10(2): 199-214, 2005 [Impact factor: 0.75]
- 2005 A. Sarkar, A. Banerjee, N. Banerjee, S. Brahma, B. Kartekeyan, K. L. Majumder, Landcover Classification in the MRF context using Dempster-Shafer Fusion for Multisensor Imagery IEEE Transactions on Image Processing, Volume 14, No. 5, 2005 [Impact factor: 2.85]
- 2005 J. Sorber, N. Banerjee, M. D. Corner, S. Rollins, Turducken: Hierarchical Power Management for Mobile Devices, ACM MobiSys 2005 Seattle, [AR: 24%]
- 2005 R. Kumar, N. Banerjee, Running time Analysis of a Multiobjective Evolutionary Algorithm on Simple and Hard Problems, Foundations of Genetic Algorithms Workshop, 2005, [AR: 50%].
- 2004 N. Banerjee, R. Kumar, Expected Running Time Analysis of a Multiobjective Evolutionary Algorithm on Pseudo Boolean Functions, International Conference on Neural Information Processing 2004, [AR: 35%]
- 2004 A. Sarkar, N. Banerjee, P. Nair, A. Banerjee, S. Brahma, B. Kartekeyan, K. L. Majumder, An MRF Based Segmentation Approach to Classification Using Dempster Shafer Fusion for Multisensor Imagery, International Conference on Image Analysis and Recognition, 2004, [AR: 50%]
- 2003 R. Kumar, N Banerjee, Multicriteria network design using evolutionary algorithm, ACM SigEVO Genetic and Evolutionary Computation, GECCO 2003, 211-211, [AR: 46%]

Patents

- 2014 Peer and Composite Localization for Mobile Applications, With S. Agarwal, R. Chandra, A. Wolman, P. Bahl, U.S. Patent number: US 8.812.013 B2 (Issued Aug. 19, 2014).
- 2015 System and Method for detection and measurement of body part movement using Capacitive Sensors and inertial sensing systems, With R. Robucci US Patent Application: PCT/US2015/036495
- 2014 System and Method for Proximity-Based Position, Movement and Gesture Detection Using Capacitive Sensor Arrays, With R. Robucci, U.S. Patent Application: 14/523,347

Research Support

- co-PI Green Building Energy Education, Constellation Inc., \$25,000, 12/01/2015-11/31/2016.
- co-PI Designing and Developing Effective Mobile Applications, Hrabowski Innovations Fund, \$24,000, 01/01/2016-01/01/2018.
- co-PI Low Cost Continuous Virtual Energy Audit in Cyber-Physical Building Envelope, National Science Foundation, \$498,117, 09/01/2015-08/31/2018
- co-I A wearable asthma trigger monitoring system with integrated physiological monitor, NIH NIBIB, \$1,963,672, 09/01/2015-08/31/2019
- PI Automated Atypical App Permission Detection, NIST FFRDC/MITRE, \$24, 795, 06/01/2015-09/01/2015
- co-PI User-centric Energy Analytics Services, National Science Foundation, \$1,000,000, 09/01/2015-08/31/2018.

- co-PI RestEaze: Advanced ambulatory measures of leg movements including periodic leg movements during sleep, TEDCO Maryland Innovations Initiative, \$150,000, 03/03/2015-12/03/2015
- co-PI Anomaly Detection in Cyber-physical Systems: Resilience by Degree of Awareness, Office of Naval Research, \$300,000, 04/01/2015-03/31/2018
 - PI Hierarchical Capacitive Sensing for Environmental Control and Physical Therapy for Patients with Paralysis, National Science Foundation, \$650,000, Acceptance rate: 5%, 09/01/2014-08/31/2017
 - PI Hierarchical Sensing for Movement Detection, \$150,000, TEDCO Maryland Innovations Initiative, 09/01/2014-05/31/2015
 - PI Wearable Multi-sensor Gesture Recognition in Assistive Devices for Paralysis Patients, Microsoft Research Software Engineering Innovations Award, \$25,000, Acceptance Rate: 11%, Unrestricted funds
- co-PI Smartphone applications for information dissemination to corn and grain sorghum producers, Arkansas Corn and Sorghum Board, \$100,000, 02/01/2012-01/31/2015
 - PI System Support for Green Homes, \$400,000, National Science Foundation, 08/01/2011-07/31/2016
 - PI CAREER: System Support for Renewable Energy-driven Devices, \$450,000, National Science Foundation, 02/01/2011-01/31/2016
 - PI Self-Sustainable Solar Powered Emergency Mesh Design, \$485,000, 08/01/2011-07/30/2014
 - PI Mobidemics: Using Mobile Gaming for Healthcare, \$50,000, National Science Foundation, 10/01/2011-03/01/2012, (First group of researchers chosen for this grant)