

Amitangshu Pal

CONTACT INFORMATION Department of Computer and Information Sciences mobile: +1 980-229-3383
College of Science and Technology e-mail: amitangshu.pal@temple.edu
Temple University Citizen: Indian (currently on H1B visa)
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RESEARCH INTERESTS **Energy Harvesting Wireless Sensor Networks:** Energy-aware routing, power control, dynamic channel selection, dynamic sampling rate adaptation, localization, experimental testbed development and validation.

Perishable Food Quality Sensing and Communication: Building cyber-physical systems for perishable food logistics, sensing and communication through food medium, policy management and information sharing, agility and reconfigurability.

Disaster Management Networks: Reliable sensing and communications, smartphone based ad-hoc networks, energy-aware forwarding, data gathering and analytics.

Wireless-Optical Access Networks: Network architecture planning and setup, joint routing and channel selection schemes, quality of service, power efficiency.

Multihop Wireless Networks: Routing, medium access control, cross-layer optimizations, modeling and performance evaluation.

EDUCATION **The University of North Carolina at Charlotte**, Charlotte, NC, USA
Ph.D., Electrical and Computer Engineering **August 2008 - December 2013**

- Dissertation title: *Dynamic Routing with Cross-Layer Adaptations for Multi-hop Wireless Networks*
- Advisor: Dr. Asis Nasipuri
- CGPA 4.0/4.0

The University of North Carolina at Charlotte, Charlotte, NC, USA
Master of Science, Electrical and Computer Engineering **August 2008 - May 2013**

- Advisor: Dr. Asis Nasipuri
- CGPA 4.0/4.0

Jadavpur University, Kolkata, West Bengal, India
B.E., Computer Science and Engineering **August 2004 - May 2008**

- Senior project title: *Fault Detection and Localization Scheme for Multiple Failures in Optical Networks*
- Advisor: Dr. Amitava Mukherjee, Dr. Mrinal Kanti Naskar, Dr. Mita Nasipuri
- CGPA 8.61/10 (80.91%)

PROFESSIONAL EXPERIENCE **Department of Computer and Information Sciences, Temple University**, Philadelphia, PA, USA
Instructor **July 2017 - present**

- Mathematical Concepts in Computing I (Fall 2017, Fall 2018)
- Computer Systems and Low-Level Programming (Fall 2017, Spring 2018)
- Projects in Computer Science (Spring 2018)

Department of Computer and Information Sciences, Temple University, Philadelphia, PA, USA
Postdoctoral Researcher **July 2014 - present**

- Supervisors: Dr. Krishna Kant
- Working on a magnetic induction based communication framework for food spoilage detection.
- Working on the distribution logistics of Fresh Food Physical Internet.
- Explored different network adaptations on water flow driven sensor networks for leakage and contamination monitoring.
- Developed a reconfigurable all-optical Data Center Networking architecture.
- Proposed a Smartphone based disaster monitoring scheme in evolving disaster scenarios.
- Developed a neighborhood aware caching and Interest dissemination scheme in Content Centric Networks.

- Assisted in writing successful NSF grants CNS-1542839, CNS-1744187 and CNS-1844944.

Department of Electrical and Computer Engineering, The University of North Carolina at Charlotte, Charlotte, NC, USA

Lecturer

August 2013 - June 2014

- Data Communications and Networking (Spring 2014)
- Network Theory II (Fall 2013, Spring 2014)
- Signals and Systems (Fall 2013)

Wireless Communications and Networking Research Lab, ECE, The University of North Carolina at Charlotte, Charlotte, NC, USA

Research Assistant

August, 2011 - July 2013

- Developed a solar-powered wireless sensor network testbed, named EPIC-RoofNet.
- Developed a power control and routing scheme for rechargeable wireless sensor networks.
- Developed an analytical model of network lifetime in an asynchronous wireless sensor network with multiple channels and power control.
- Developed a RSSI based localization scheme for wireless sensor networks in obstructed environments.
- Developed a multi-channel routing scheme for wireless sensor networks with an objective of prolonging the network lifetime.
- Developed an analytical model for performance analysis of IEEE 802.11 Distributed Coordination Function in Radio-over-Fiber wireless LANs.
- Explored the effects of optical network unit placement in multi-channel wireless-optical access networks.
- Developed a joint routing, channel assignment and gateway selection scheme for wireless optical broadband access networks.

Department of Electrical and Computer Engineering, The University of North Carolina at Charlotte, Charlotte, NC, USA

Teaching Assistant

August 2008 – May 2012

- Computer Arithmetic (Fall 2008)
- Network Theory I (Spring 2009, Fall 2009, Spring 2010)
- Data Communications and Networking (Fall 2010, Spring 2011, Fall 2011)
- Wireless Sensor Networks (Spring 2012)

Toyota InfoTechnology Center, Mountain View, CA, USA

Research Intern

July 2012 - August 2012

- Supervisors: Dr. Ryuji Wakikawa and Dr. Roger Melen
- Developed different schemes for secured Internet connection from a vehicle using the wireless access of the charging station.
- Worked on a mobile IPv6 testbed to implement the schemes.

Advanced Digital and Embedded Systems Lab, Jadavpur University, Kolkata, West Bengal, India

Project Student

August, 2006 -May, 2008

- Developed a fault detection and localization scheme for optical networks.

HONOURS AND AWARDS

Recipient of **Outstanding Graduate Teaching Assistant Award 2012-2013**, Electrical and Computer Engineering, The University of North Carolina at Charlotte, Charlotte, NC, USA.

Recipient of **Graduate Assistant Support Plan (GASP) Award**, Electrical and Computer Engineering, The University of North Carolina at Charlotte, Charlotte, NC, USA, 2008 - 2013.

JOURNAL PUBLICATIONS

Amitangshu Pal, Mayank Raj, Krishna Kant and Sajal Das, “A Smartphone based Network Architecture for Post-Disaster Operations using WiFi Tethering”, *submitted (with major revision) to IEEE Transactions on Mobile Computing*.

Amitangshu Pal, and Krishna Kant, “Smart Sensing, Communication, and Control in Perishable Food Supply Chain”, *in submission (with major revision) to ACM Transactions on Sensor Networks*.

Joyanta Biswas, Madhurima Ray, Sanjeev Sondur, **Amitangshu Pal**, and Krishna Kant, “Coordinated Power Management in Data Center Networks”, *submitted (with major revision) to Elsevier Sustainable Computing, Informatics and Systems*.

Amitangshu Pal, and Krishna Kant, “Internet of Perishable Logistics: Architecture, Challenges and Road Ahead”, *IEEE Access*, 2019.

Amitangshu Pal and Krishna Kant, “IoT Based Sensing and Communication Infrastructure for Fresh Food Supply Chain”, *IEEE Computer*, 2018.

Amitangshu Pal and Asis Nasipuri, “A Joint Routing and Channel Assignment Scheme for Hybrid Wireless-Optical Broadband-Access Networks”, *MDPI Journal of Sensor and Actuator Networks*, Vol. 7, No. 44, pp 1-24, 2018.

Amitangshu Pal and Asis Nasipuri, “Distributed Routing and Channel Selection for Multi-Channel Wireless Sensor Networks”, *MDPI Journal of Sensor and Actuator Networks*, Vol. 6, No. 10, pp 1-18, 2017.

Krishna Kant and **Amitangshu Pal**, “Internet of Perishable Logistics”, *IEEE Internet Computing*, Vol. 21, No. 1, pp 22-31, 2017.

Ibrahim El-Shekeil, **Amitangshu Pal** and Krishna Kant, “PRECESION: Progressive Recovery and Restoration Planning of Interdependent Services in Enterprise Data Centers”, *Elsevier Digital Communications and Networks*, 2017.

Amitangshu Pal and Krishna Kant, “A Food Transportation Framework for an Efficient and Worker-friendly Fresh Food Physical Internet”, *MDPI Logistics Journal*, 2017.

Amitangshu Pal and Asis Nasipuri, “A Quality Based Routing Protocol for Wireless Mesh Networks”, *Elsevier Pervasive and Mobile Computing*, Vol. 7, No. 5, pp 611-626, 2011.

Amitangshu Pal, Amitava Mukherjee, Mrinal Kanti Naskar and Mita Nasipuri, “Minimal Monitor Activation and Fault Localization in Optical Networks Optical Switching and Networking”, *Elsevier Optical Switching and Networking*, Vol. 8, No. 1, pp 46-55, 2011.

Amitangshu Pal, “Localization Algorithms in Wireless Sensor Networks: Current Approaches and Future Challenges”, *International Journal of Network Protocols and Algorithms*, Vol. 2, No. 1, pp 45-74, 2010.

Yilang Wu, **Amitangshu Pal**, Krishna Kant and Junbo Wang “Incremental Spatial Clustering for Spatial Big Crowd Data in Evolving Disaster Scenario”, In *IEEE CCNC 2019*, Las Vegas, USA.

Minh Nguyen, **Amitangshu Pal** and Saptarshi Debroy, “Whack-a-Mole: Software-defined Networking driven Multi-level DDoS defense for Cloud environments”, In *IEEE LCN 2018*, Chicago, USA.

Shanshan Zhang, **Amitangshu Pal**, Krishna Kant and Slobodan Vucetic, “Enhancing Disaster Situational Awareness via Automated Summary Dissemination of Social Media Content”, In *IEEE Globecom 2018*, Abu Dhabi, UAE.

Malek Athamnah, **Amitangshu Pal** and Krishna Kant, “A Framework For Misconfiguration Diagnosis in Interconnected Multiparty Systems”, In *IEEE ICCCN 2018*, Hangzhou, China.

Amitangshu Pal and Krishna Kant, “E-Darwin2: A Smartphone Based Disaster Recovery Network using WiFi Tethering”, In *IEEE CCNC 2018*, Las Vegas, USA.

Ibrahim El-Shekeil, **Amitangshu Pal** and Krishna Kant, “CloudMiner: A Systematic Failure Diagnosis Framework in Enterprise Cloud Environments”, In *IEEE CloudCom 2018*, Nicosia, Cyprus.

Madhurima Ray, Sanjeev Sondur, Joyanta Biswas, **Amitangshu Pal** and Krishna Kant, “Opportunistic Power Savings with Coordinated Control in Data Center Networks”, In *ICDCN 2018*, Varanasi, India.

Dusan Ramljak, **Amitangshu Pal** and Krishna Kant, “Pattern Mining Based Compression of IoT Data”, In *SCC 2018*, Varanasi, India.

Amitangshu Pal and Krishna Kant, “Magnetic Induction Based Sensing and Localization for Fresh Food Logistics”, In *IEEE LCN 2017*, Singapore.

Amitangshu Pal and Krishna Kant, “NACID: A Neighborhood Aware Caching and Interest Dissemination in Content Centric Networks”, In *IEEE ICCCN 2017*, Vancouver, Canada.

Yilang Wu, Krishna Kant, Shanshan Zhang, **Amitangshu Pal** and Junbo Wang, “Disaster Network Evolution Using Dynamic Clustering of Twitter Data”, In *IEEE ICDCS Workshop 2017*, Atlanta, GA, USA.

Amitangshu Pal and Krishna Kant, “SmartPorter: A Combined Perishable Food and People Transport Architecture in Smart Urban Areas”, In *IEEE SMARTCOMP 2016*, St. Louis, Missouri, USA.

Amitangshu Pal and Krishna Kant, “On the Feasibility of Distributed Sampling Rate Adaptation

in Heterogeneous and Collaborative Wireless Sensor Networks”, In *IEEE ICCCN 2016*, Waikoloa, Hawaii, USA.

Ibrahim El-Shekeil, **Amitangshu Pal** and Krishna Kant, “IP Address Consolidation and Reconfiguration In Enterprise Networks”, In *IEEE ICCCN 2016*, Waikoloa, Hawaii, USA.

Ibrahim El-Shekeil, **Amitangshu Pal** and Krishna Kant, “Progressive Recovery of Interdependent Services in Enterprise Data Centers”, In *IEEE ISRCS 2016*, Chicago, Illinois, USA.

Amitangshu Pal and Krishna Kant, “Networking in the RealWorld: Unified Modeling of Information and Perishable Commodity Distribution Networks”, In *IPIC 2016*, Atlanta, Georgia, USA.

Amitangshu Pal and Krishna Kant, “F² π : A Physical Internet Architecture for Fresh Food Distribution Networks”, In *IPIC 2016*, Atlanta, Georgia, USA.

Amitangshu Pal and Krishna Kant, “RODA: A Reconfigurable Optical Data Center Network Architecture”, In *IEEE LCN 2015*, pp. 561–569, Clearwater Beach, Florida, USA.

Amitangshu Pal and Krishna Kant, “Collaborative Heterogeneous Sensing: An Application to Contamination Detection in Water Distribution Networks”, In *IEEE ICCCN 2015*, Las Vegas, Nevada, USA.

Amitangshu Pal and Krishna Kant, “Water Flow Driven Sensor Networks for Leakage and Contamination Monitoring”, In *IEEE WoWMoM 2015*, Boston, MA, USA.

Amitangshu Pal and Asis Nasipuri, “PCOR: A Joint Power Control and Routing Scheme for Rechargeable Sensor Networks”, In *IEEE WCNC 2014*, pp. 2230–2235, Istanbul, Turkey.

Amitangshu Pal and Asis Nasipuri, “Lifetime of Asynchronous Wireless Sensor Networks with Multiple Channels and Power Control”, In *IEEE WCNC 2014*, pp. 2874–2879, Istanbul, Turkey.

Amitangshu Pal and Asis Nasipuri, “Effects of Optical Network Unit Placement Schemes for Multi-Channel Hybrid Wireless-Optical Broadband-Access Networks”, In *IWON 2013*, Atlanta, GA, USA.

Amitangshu Pal and Asis Nasipuri, “DRCS: A Distributed Routing and Channel Selection Scheme for Multi-Channel Wireless Sensor Networks”, In *IEEE PerSeNS 2013*, pp. 602-608, San Diego, California, USA.

Amitangshu Pal, Bonee Soibam and Asis Nasipuri, “A Distributed Power Control and Routing Scheme for Rechargeable Sensor Networks”, In *IEEE SoutheastCon 2013*.

Ndubueze Chuku, **Amitangshu Pal** and Asis Nasipuri, “An RSSI Based Localization Scheme for Wireless Sensor Networks to Mitigate Shadowing Effects”, In *IEEE SoutheastCon 2013*.

Amitangshu Pal and Asis Nasipuri, “A Distributed Channel Selection Scheme for Multi-Channel Wireless Sensor Networks”, In *Proc. ACM MobiHoc 2012*, pp. 263-264, Hilton Head Island, SC, USA.

Amitangshu Pal and Asis Nasipuri, “JRCA: A Joint Routing and Channel Assignment Scheme for Wireless Mesh Networks”, In *Proc. IEEE IPCCC 2011*, Orlando, Florida, USA.

Amitangshu Pal and Asis Nasipuri, “Performance Analysis of IEEE 802.11 Distributed Coordination Function in Presence of Hidden Stations under Non-saturated Conditions with Infinite Buffer in Radio-over-Fiber Wireless LANs”, In *Proc. IEEE LANMAN 2011*, Chapel Hill, NC, USA.

Amitangshu Pal and Asis Nasipuri, “GSQAR: A Quality Aware Anycast Routing Protocol for Wireless Mesh Networks”, In *Proc. IEEE Globecom 2010*, Miami, Florida, USA.

Amitangshu Pal and Asis Nasipuri, “A Quality Aware Anycast Routing Protocol for Wireless Mesh Networks”, In *Proc. IEEE SoutheastCon 2010*, pp. 451-454, Charlotte, NC, USA.

Amitangshu Pal, Sandeep Adimadhyam and Asis Nasipuri, “QoSBR: A Quality Based Routing Protocol for Wireless Mesh Networks”, In *Proc. ICDCN 2010*, pp. 497-508, Kolkata, India.

Amitangshu Pal, Amitava Mukherjee, Mrinal Kanti Naskar, “201cFault and Attack Management in Optical Networks”, In *Proc. IEEE IC4 2009*, Karachi, Pakistan.

A. Pal, A. Mukherjee, M. K. Naskar, P. Dey, A. Kundu, “Dynamic Bandwidth Provisioning and Survivability in IP over WDM Network”, In *Proc. IEEE ANTS 2008*, Mumbai, India (accepted).

Amitangshu Pal, “A Summary of Current Approaches and Future Challenges in IP Over WDM”, In *Proc. ICACT 2008*, Hyderabad, India.

A. Pal, A. Paul, A. Mukherjee, M. K. Naskar and M. Nasipuri, “Fault Detection and Localization Scheme for Multiple Failures in Optical Network”, In *Proc. ICDCN 2008*, pp. 464-470, Kolkata, India.

A. Pal, A. Paul, A. Mukherjee, and M. K. Naskar, “Fault and Attack management in Optical Networks”, In *Proc. IEEE ANTS 2007*, Mumbai, India.

TECHNICAL
REPORT

Amitangshu Pal, Anthony Harris, Jason Anderson, Asis Nasipuri, Robert Cox, and James Conrad, “EPIC-RoofNet: An Experimental Testbed for Solar-powered Wireless Sensor Networks”, Technical report, The University of North Carolina at Charlotte, ECE Department, July 2013.

PRESENTATIONS &
TALKS

“Dynamic Routing with Cross-layer Adaptations for Rechargeable Wireless Sensor Networks”, In *University of Missouri*, Columbia, Missouri, USA.

“Progressive Recovery of Interdependent Services in Enterprise Data Centers”, In *IEEE ISRCS 2016*, Chicago, Illinois, USA.

“F² π : A Physical Internet Architecture for Fresh Food Distribution Networks”, In *IPIC 2016*, Atlanta, Georgia, USA.

“RODA: A Reconfigurable Optical Data Center Network Architecture”, In *IEEE LCN 2015*, Clearwater Beach, Florida, USA.

“Effects of Optical Network Unit Placement Schemes for Multi-Channel Hybrid Wireless-Optical Broadband-Access Networks”, In *IWON 2013*, Atlanta, GA, USA.

“A Distributed Power Control and Routing Scheme for Rechargeable Sensor Networks”, In *IEEE SoutheastCon 2013*, Jacksonville, Florida, USA.

“Secured Connectivity For Electric Vehicles in Charging Station Wireless Access Networks”, In *Toyota InfoTechnology Center*, Mountain View, CA, USA.

“A Distributed Channel Selection Scheme for Multi-Channel Wireless Sensor Networks”, In *ACM MobiHoc 2012*, Hilton Head Island, SC, USA.

“JRCA: A Joint Routing and Channel Assignment Scheme for Wireless Mesh Networks”, In *IEEE IPCCC 2011*, Orlando, Florida, USA.

“Performance Analysis of IEEE 802.11 Distributed Coordination Function in Presence of Hidden Stations under Non-saturated Conditions with Infinite Buffer in Radio-over-Fiber Wireless LANs”, In *IEEE LANMAN 2011*, Chapel Hill, NC, USA.

“GSQAR: A Quality Aware Anycast Routing Protocol for Wireless Mesh Networks”, In *IEEE Globecom 2010*, Miami, Florida, USA.

“A Quality Aware Anycast Routing Protocol for Wireless Mesh Networks”, In *IEEE SoutheastCon 2010*, Charlotte, NC, USA.

“Fault Detection and Localization Scheme for Multiple Failures in Optical Network”, In *ICDCN 2008*, Kolkata, India.

“Fault and Attack management in Optical Networks”, In *IEEE ANTS 2007*, Mumbai, India.

STUDENTS
SUPERVISED

Ibrahim El-Shekeil, *Temple University*, 2015-2018.

Madhurima Ray, *Temple University*, 2016-present.

Joyanta Biswas, *Temple University*, 2016-present.

Rajpreet Gulati, *Temple University*, 2017-present.

Bonee Soibam, *UNC Charlotte*, 2012-2014.

Ndubueze Chuku, *UNC Charlotte*, 2012-2014.

RELEVANT
COURSES

Advanced Theory of Communications, Fundamentals of Wireless Systems and Protocols, Data Communications and Networking, Digital Signal Processing, Embedded Wireless Systems, Performance Analysis in Communication Networks, Analog and Digital Communications, Wireless Communications and Networking, Optical Communications, Engineering Systems Optimization, Statistics in Bioinformatics, Data Structures, Algorithm Analysis, Database Systems, Compilers, Graph Theory.

PROFESSIONAL
SERVICE

- Reviewer of IEEE HONET 2010, ICDCN 2012, IEEE GLOBECOM 201, IEEE GLOBECOM 2012, IEEE ICC 2013, IEEE MILCOM 2013, ICMU 2014, ICDCN 2014, IEEE INFOCOM 2015, IFIP newtorking 2015, IEEE INFOCOM 2016, IEEE IPDPS 2016, IFIP newtorking 2017, Elsevier Ad-Hoc Networks, International Journal of Sensor Networks, IEEE Internet Computing Magazine, International Journal of Ad Hoc and Ubiquitous Computing, Elsevier Computer Networks, IEEE Transactions on Mobile Computing, MDPI Sensors Journal.

- Student volunteer for IEEE SoutheastCon 2010, ACM MobiHoc 2012.

TECHNICAL SKILLS **Programming Languages:**

C, C++, Python, Java, Perl, TCL, NesC for TinyOS

Operating Systems:

Linux/Unix, Windows

Tools:

NS-2 network simulator, Castalia, ccnSim, MATLAB, CPLEX

REFEREES

Asis Nasipuri

Professor & Chair

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Computer Science

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Krishna Kant

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Jiang (Linda) Xie

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