

PRADIPTA GHOSH

Phone: (213) 453 - 9078 Email: pradiptg@usc.edu
Web-page: www.pradiptaghosh.com

EDUCATION **PhD in Electrical Engineering** **2012 - Present**
(Concentration: Computer Engineering)
Viterbi School of Engineering, University of Southern California, USA
Expected Graduation Year: 2017
GPA: 3.97/4.0

MS in Electrical Engineering **2012 - 2016**
Viterbi School of Engineering, University of Southern California, USA
GPA: 3.97/4.0

Bachelor of Engineering, **2008 - 2012**
Electronics and Tele-Communication Engineering
Jadavpur University, India
GPA: 9.25/ 10

ACADEMIC AREAS OF INTEREST Internet of Things, Wireless Robotic Networks, Cloud Computing, Software Defined Network, Wireless Sensor Networks, Ad-Hoc Networks, Wireless Communication, Co-ordinated Robotics, Antenna Design, Artificial Intelligence, Evolutionary Computation

TECHNICAL SKILLS **Languages:** C, C++
Languages (Beginner Level): Java, HTTP, Android, PHP, MySQL, Python
Version Control Systems: GIT, SVN
Operating Systems: Windows 2000/ME/XP/Vista/7, Linux/Unix, MAC OS
Application Software & Hardware: MATLAB, Contiki OS, Cooja Network Simulator, ROS, OPNET, Wireshark, Circuit Maker Professional Edition; Tmote sky, 8085 Microprocessor

ACADEMIC/ PROFESSIONAL EXPERIENCES **Teaching Assistant** **Jan 2016 - May 2016**
• *Ming Hsieh Department of Electrical Engineering*
University of Southern California, Los Angeles, CA-90089
• *Course Title:* EE 579: Wireless and Mobile Networks Design and Laboratory
• *Advisor(s):* Prof. Bhaskar Krishnamachari

Summer Internship at Cisco Systems **Jun 2015 - Aug 2015**
• *Cisco Systems, San Jose, CA-95134*
• *Advisor(s):* Nilesh Shah, Shyam Kapadia

Teaching Assistant **Aug 2014 - Dec 2015**
• *Ming Hsieh Department of Electrical Engineering*
University of Southern California, Los Angeles, CA-90089
• *Course Title:* EE 450 -Computer Networks
• *Advisor(s):* Prof. Ali Zahid

USC Doctoral Student Summer Institute **May 2014 - August 2014**
• *Grant Proposal Writing and Publication Workshop*
• *Organizer(s):* USC Graduate School

Research Internship at General Motors **May 2013 - July 2013**
• Electrical & Controls Integration Lab
General Motors Research & Development, Warren, MI 48090
• *Advisor(s):* Dr. Fan Bai and Massimo Osella

Research Assistant **Aug 2012 - Present**
• *Autonomous Networks Research Group*
University of Southern California, Los Angeles, CA-90089
• *Advisor(s):* Prof. Bhaskar Krishnamachari

Research Internship at IISc **May 2011 - July 2011**
• *Department of Aerospace Engineering*
Indian Institute of Science, Bengaluru, Karnataka 560012, India
• *Advisor(s):* Prof. Debasish Ghose

Summer Internship at IIT Kharagpur **May 2010 - June 2010**
• Department of Electronics and Electrical Communication Engineering, and Department of Agricultural & Food Engineering,
IIT Kharagpur, Kharagpur, West Bengal 721302, India
• *Advisor(s):* Prof. Raja Datta and Prof. Bijoy Chandra Ghosh

Undergraduate Student Researcher **Aug 2010 - Aug 2012**
• *Advanced Digital and Embedded Systems Laboratory*
Jadavpur University, Kolkata, West Bengal 700032, India
• *Advisor(s):* Prof. Mrinal Kanti Naskar

Undergraduate Student Researcher **Sep 2009 - Aug 2012**
• *Digital Control and Image Processing Laboratory*
Jadavpur University, Kolkata, West Bengal 700032, India
• *Advisor(s):* Prof. Swagatam Das

**ACADEMIC/
PROFESSIONAL
SERVICES**

Mentor for Summer Interns: **Summer 2016**
• *Autonomous Networks Research Group*
University of Southern California, Los Angeles, CA-90089
• *Student(s):* Antonio Teixeira, Jenny Xie and Saksham Agarwal
• *Advisor(s):* Prof. Bhaskar Krishnamachari

Viterbi Graduate Mentorship Program: **Spring 2016**
• *University of Southern California, Los Angeles, CA-90089*

Mentor for Directed Research Students: **2015 - Present**
• *Autonomous Networks Research Group*
University of Southern California, Los Angeles, CA-90089
• *Student(s):* Palash Agrawal, Ankith Shashikanthreddy, Aashiq Ahmed and Ling Ye
• *Advisor(s):* Prof. Bhaskar Krishnamachari

Mentor for Summer Interns: **Summer 2014**
• *Autonomous Networks Research Group*
University of Southern California, Los Angeles, CA-90089
• *Student(s):* Yash Goyal, Raktim Pal and He Ren
• *Advisor(s):* Prof. Bhaskar Krishnamachari

Review Experiences: **2010 - Present**

- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- IEEE Transactions on Mobile Computing
- International Conference on Distributed Computing Systems 2014
- IEEE BlackSeaCom 2014
- Progress In Electromagnetics Research (PIER)
- International Conference on Swarm, Evolutionary and Memetic Computing (SEM-CCO)

FELLOWSHIPS AND AWARDS	USC Graduate School Ph.D. Fellowships Travel Award	Fall 2014
	IEEE MASS 2014 Travel Grant	Oct 2014
	USC Summer Institute Funding	Summer 2014
	USC Provost's Ph.D. Fellowship	2012 - 2016
	UGC Infrastructure Grant for Undergraduate Research	2011 - 2012

**RESEARCH
PROJECTS**

Completed Projects:

- Integration of Bare-metal Servers with Programmable Fabric
- Cloud Computing and Application Offloading to Increase Processing Capacity of Low Power Devices
- Handoff Reduction Algorithms in WLAN, Mobile Communication Systems and Low Earth Orbit Satellites
- Hybridization of Various Unimodal & Multimodal Optimization Algorithms to Develop New Improved Algorithms
- Clustering Methods in Wireless Sensor Network by Proper Utilization of the Available Energy and Pre-defined Parameters and Hybridization of Various Clustering Algorithms in Wireless Sensor Networks to Develop a New Improved Algorithm
- Study of Various Evolutionary Algorithms in Optimizing Antenna Structures and Antenna Array Design Using Optimization Algorithms Like DE and PSO
- Study and Simulation of Various Practical Operations Using 8051 and PIC Microcontroller and Design and Implementation of a Micro controller Based Line Follower Robot
- Study of Various Routing Methods in Wireless Sensor Network, Hybridization of Various Available Methods to Obtain Better Algorithm and Throughput Analysis of Core Routers

Ongoing Projects:

- Survey of Networking Issues and Potential areas of Research in Wireless Network of Mobile Robots
- Distributed Hole Detection in Wireless Sensor Networks
- Robotic Router Placement Optimization Based on Practical Communication Model Including Interference
- Heat Diffusion Collection Protocol Implementation for Energy Efficient Data Collection in any IoT Network
- A Practical System Framework for Wireless Network of Robots
- ARREST: A RSSI Based Approach for Relative Positioning and Tracking of a Moving Object

**SELECTED
ACADEMIC
PUBLICATIONS**

Book Chapters & Conference Papers:

1. **Pradipta Ghosh**, Raktim Pal and Bhaskar Krishnamachari, “*Towards Controllability of Wireless Network Quality using Mobile Robotic Routers*, in arXiv preprint arXiv:1607.07848
2. Pedro Henrique Gomes, Thomas Watteyne, **Pradipta Ghosh** and Bhaskar Krishnamachari, “*Competition: Reliability through Timeslotted Channel Hopping and Flooding-based Routing*,” in Proceedings of the **International Conference on Embedded Wireless Systems and Networks (EWSN 2016)**, February 15-17, Graz, Austria
3. **Pradipta Ghosh**, Jie Gao, Andrea Gasparri and Bhaskar Krishnamachari, “*Distributed Hole Detection Algorithms for Wireless Sensor Networks*,” in **IEEE International Conference on Mobile Ad hoc and Sensor Systems (MASS 2014)**, October 27-30, Philadelphia, Pennsylvania, USA.
4. **Pradipta Ghosh**, Jie Gao, Andrea Gasparri and Bhaskar Krishnamachari, “*River-Swarm: Topology-Aware Distributed Planning for Obstacle Encirclement in Connected Robotic Swarms*,” in **First Workshop on Robotic Sensor Networks 2014 (RSN2014)**, April 14, Berlin, Germany.
5. **Pradipta Ghosh**, Hamim Zafar and Ankush Mandal, “*Modified Local Neighborhood Based Niching Particle Swarm Optimization for Multimodal Function Optimization*,” in **Proceedings of Swarm Evolutionary and Memetic Computing Conference (SEMCCO) 2011**, Dec 19-21, Visakhapatnam, Andhra Pradesh, India.
6. **Pradipta Ghosh**, Hamim Zafar, Joydeep Banerjee and Swagatam Das, “*Design of Two-Channel Quadrature Mirror Filter Banks Using Differential Evolution with Global and Local Neighborhoods*,” in **Proceedings of Swarm Evolutionary and Memetic Computing Conference (SEMCCO) 2011**, Dec 19-21, Visakhapatnam, Andhra Pradesh, India.
7. Ankush Mandal, Hamim Zafar, **Pradipta Ghosh**, Swagatam Das and Ajith Abraham, “*An Efficient Memetic Algorithm for Parameter Tuning of PID Controller in AVR System*,” in **Proceedings of IEEE Hybrid Intelligent Systems (HIS) 2011**, December 5-8, Malacca, Malaysia.
8. **Pradipta Ghosh**, Hamim Zafar, Swagatam Das and Ajith Abraham, “*Hierarchical Dynamic Neighborhood Based Particle Swarm Optimization for Global Optimization*,” in **Proceedings of IEEE Congress on Evolutionary Computation (CEC) 2011**, June 5-8, 757-764, New Orleans.
9. Joydeep Banerjee, Souvik Kumar Mitra, **Pradipta Ghosh** and Mrinal Kanti Naskar, “*Memory Based Message Efficient Clustering (MMEC) for Enhancement of Lifetime in Wireless Sensor Networks Using a Node Deployment Protocol*,” in **Proceedings of International Conference on Communication, Computing & Security (ICCCS) 2011**, Feb 12-14, Orissa, India.
10. Joydeep Banerjee, Swarup Kumar Mirta, **Pradipta Ghosh** and Mrinal Kanti Naskar, “*An Optimized Reduced Energy Consumption (OREC) Algorithm for Routing in Wireless Sensor Networks*,” in **Communications in Computer and Information Science**, 1, Volume 192, Advances in Computing and Communications, Part 2, Pages 82-92
11. **Pradipta Ghosh**, Joydeep Banerjee, Swarup Kumar Mirta, Souvik Kumar Mitra and Mrinal Kanti Naskar, “*Sequential Multi-Clustering Protocol Using a Node Deployment Protocol for Efficient Multi-Clustering in Wireless Sensor Networks*,” in **Communications in Computer and Information Science**, 1, Volume 196, Advances in Network Security and Applications, Part 2, Pages 526-536.

Journal Papers:

1. **Pradipta Ghosh**, Swagatam Das and Hamim Zafar, “*Adaptive differential evolution based design of two-channel quadrature mirror filter banks for sub-band coding and data transmission,*” in **IEEE Transactions on Systems, Man, and Cybernetics, Part - C**, Volume: 42, Issue: 6, Page(s): 1613-1623, 2012. (Publisher: IEEE, Impact Factor (2012):2.009).
2. **Pradipta Ghosh**, Joydeep Banerjee, Shelly Sinha Chowdhury and Swagatam Das, “*Design of non-uniform circular antenna arrays — an evolutionary algorithm based approach,*” in **Progress In Electromagnetics Research B**, Vol. 43, 333-354, 2012. (Publisher: EMW Publishing, Impact Factor (2010): 3.745).
3. **Pradipta Ghosh** and Swagatam Das, “*Synthesis of Thinned Planar Concentric Circular Antenna Arrays — A Differential Evolutionary Approach,*” in **Progress In Electromagnetics Research B**, Vol. 29, 63-82, 2011. (Publisher: EMW Publishing, Impact Factor (2010): 3.745).
4. Swarup Kumar Mitra, Joydeep Banerjee, **Pradipta Ghosh** and Mrinal Kanti Naskar. “*Analysis of Network Lifetime for Wireless Sensor Network,*” in **International Journal of Computer Applications** 32 (1): 39-45, October 2011. (Publisher: Foundation of Computer Science, New York, USA, Impact Factor: 0.835).

Unpublished / Under Review Papers:

1. **Pradipta Ghosh**, He Ren, Reza Banirazi, Bhaskar Krishnamachari and Edmond Jonckheere, “*Empirical Evaluation of the Heat-Diffusion Collection Protocol for Wireless Sensor Networks*”
2. **Pradipta Ghosh** and Bhaskar Krishnamachari, “*ARREST: A RSSI Based Approach for Relative Positioning and Tracking of a Moving Object*”
3. **Pradipta Ghosh**, Jie Gao, Andrea Gasparri and Bhaskar Krishnamachari, “*Distributed Hole Detection Algorithms for Wireless Sensor Networks*”
4. **Pradipta Ghosh** and Bhaskar Krishnamachari, “*Interference Power Bound Analysis of a Network of Wireless Robots*”

CONFERENCE AND POSTER PRESENTATIONS

- “*Implementation and Performance Evaluation of the Heat-Diffusion Collection Protocol for Wireless Sensor Networks,*” in **6th Annual Ming Hsieh Department of Electrical Engineering Research Festival**, University of Southern California, Los Angeles, California, USA.
- “*Distributed Hole Detection Algorithms for Wireless Sensor Networks,*” in **IEEE International Conference on Mobile Ad hoc and Sensor Systems (MASS 2014)**, Philadelphia, Pennsylvania, USA.
- “*RiverSwarm: Topology-Aware Distributed Planning for Obstacle Encirclement in Connected Robotic Swarms,*” in **5th Annual Ming Hsieh Department of Electrical Engineering Research Festival**, University of Southern California, Los Angeles, California, USA.

ACHIEVEMENTS

- Research was featured in USC News
- Accepted for USC Doctoral Student Summer Institute, a program administered by the USC Graduate School, Academic Professional Development (APD) & Enhancing Diversity in Graduate Education (EDGE) with summer funding.
- Accepted for Ph.D program at USC with USC Provost’s Fellowship

- Ranked 55th (General) in Engineering in WBJEE (2008) among about 1,00,000 students.
- Ranked 168th (General) in Medical in WBJEE (2008) among about 60,000 students