

Mohammad H. Rahimi

CONTACT INFORMATION	Center For Embedded Networked Sensing University of California, Los Angeles (UCLA) Los Angeles, CA USA 90095-1596	Voice: (310) 825-5274 Fax: (310) 206-3053 E-mail: mhr@cens.ucla.edu http://cens.ucla.edu/~mhr
RESEARCH INTERESTS	Mobile Phone Technology, Wireless Networks, network architectures, Sensor Networks, Robotics, experimental testbeds and operational systems for scientific and social applications.	
EDUCATION	University Of Southern California (USC) , Los Angeles, CA USA	
	<i>PH.D., Computer Sciences</i>	2002-2006
	<ul style="list-style-type: none">• Thesis Topic: Bioscope: Actuated Sensor Network for Biological Science• Advisor: Gaurav S. Sukhatme• Committee: Deborah Estrin, Mark Hansen, William Kaiser, John Heidemann• Area of Study: Robotics, Networking	
	<i>M.S., Electrical Engineering</i>	2000-2002
	<ul style="list-style-type: none">• Minor in Computer Networks	
	Tehran University , Tehran, IRAN	
	<i>B.S., Electrical Engineering</i>	1992-1996
PROFESSIONAL EXPERIENCE	Center For Embedded Networked Sensing , Los Angeles, CA	
	<i>Research Staff</i>	2002-current
	<ul style="list-style-type: none">• Applications of mobile phone technology using sensor such as image, accelerometer sensors and location sensors.• Design low-power hardware and software for embedded devices• Design hardware and software for wireless sensor networks• Research and development in networking and data delivery systems• Design of wireless image networks• Write scientific and technical articles, reports and proposals• Supervise students	
	Information Sciences Institute (ISI) , Los Angeles, CA	
	<i>Graduate Student Research</i>	2001-2002
	<ul style="list-style-type: none">• Sensor network research• Distributed systems research• Partial design of TAG: a low power communication enabled PIC micro controller system	
	University of Southern California (USC) , Los Angeles, CA	
	<i>Graduate Student Research</i>	2000-2001
	<ul style="list-style-type: none">• Design of embedded low power robot• Research for coordination of wireless robots	

Kavoshyaran Engineering, Tehran, IRAN

Development Engineering

1996-2000

- Design of power management systems
- Design of instrumentation and data acquisition systems
- Design of strain gauge measurement and logging system
- Design of audio and video mobile microwave link system
- Design of VHF and UHF synthesizer and amplifier

TECHNOLOGY SKILLS

- Embedded Software Development
- Embedded and low power software/hardware development for AVR, TI and PIC processors
- Programming languages C, C++, PHP, Python, Javascript, NesC
- Network protocol design, MAC, transport, routing layer, TCP/IP, Bluetooth, 802.15.4
- Postgres Database and PostGIS
- Linux operating system, TinyOS
- matlab, R

NOTABLE PROJECTS

- GEOX: study properties of the geographical interconnection network and its temporal characteristics using location traces from mobile phones.
<http://geox.cens.ucla.edu>
- Rewind: using automatic image capturing from mobile phone for assisted recall application in particular to document the dietary intake of patients for further reviewing to improve the quality of self documentation of the food intake.
- Cyclops: research and development of low-power wireless image sensor networks.
http://research.cens.ucla.edu/projects/2007/Multiscaled_Actuated.Sensing/Cyclops/
- NIMS: Networked Info-mechanical Systems (NIMS) explores the interaction of mobile and static wireless sensor networks, in the context of environmental science monitoring problems.
<http://research.cens.ucla.edu/areas/2005/NIMS/>
- Robomote: Robomote project investigates proper platforms for large scale mobile sensor network experiments.
<http://www-robotics.usc.edu/robomote/>
- SCADDS: Scalable Coordination Architectures for Deeply Distributed and Dynamic Systems (SCADDS).
<http://www.isi.edu/scadds/>
- SCOWR: Scalable Coordination of Wireless Robots (SCOWR) project studies application-level algorithms for autonomous mobile sensor networks.
<http://www-robotics.usc.edu/?l=Projects:scowr>

ACADEMIC
EXPERIENCE

Courses Taught

- Designing Innovative Sensing System Using Mobile Phones and Network Services (CS129), UCLA Spring 2008. Co-Instructor with Professor Deborah Estrin.

Students Mentored

- Beayna Grigorian (Intel Scholars Program)
- Devin Sevilla (CENS summer Internship)
- Max Veledo (CENS summer Internship)
- Hootan Nikbakht (M.S. research student)
- Shaun Ahmadian (M.S. research student)
- David Zats (B.S research student)
- Juan Garcia (B.S research student)
- Obimdinachi Iroezi (joined Empower RF Systems)
- Hendra Tjahayadi (B.S. research student)
- Chris Guillory (CENS Intel Scholars Program)
- Alan Jern (CENS summer Internship)
- Edgar Ochoa (CENS summer Internship)
- Laura Dionisio (CENS summer Internship)

JOURNAL
PUBLICATIONS

- Shaun Ahmadian, Teresa Ko, Sharon Coe, M P. Hamilton, Mohammad Rahimi, Stefano Soatto, and D Estrin, "Heartbeat of a Nest: Using Imagers as Biological Sensors", Under Submission to transaction of sensor networks.
- H. Kim, M. Rahimi, D. Lee, D. Estrin, and J. D. Villasenor, "Energy-aware high resolution image acquisition via heterogeneous image sensors," to appear in IEEE Journal of Selected Topics in Signal Processing.

BOOK CHAPTER IN
PREPARATION

- Mohammad Rahimi, Mani Srivastava, "Actuation Assisted Localization of Distributed Camera Sensor Networks," to appear in "Multi-Camera Networks: Concepts and Applications," ELSEVIER 2008.

CONFERENCE AND
WORKSHOP
PUBLICATIONS

- E. Agapie, G. Chen, D. Houston, E. Howard, J. Kim, M. Y. Mun, A. Mondschein, S. Reddy, R. Rosario, J. Ryder, A. Steiner, J. Burke, E. Estrin, M. Hansen, M. Rahimi, Seeing Our Signals: Combining Location Traces and Web-Based Models for Personal Discovery. in IEEE Workshop on Mobile Computing Systems and Applications (HotMobile 2008), February 2008.
- Teresa Ko, Zainul Mohammed Charbiwala, Shaun Ahmadian, Mohammed Rahimi, Mani B. Srivastava, Stefano Soatto and D Estrin. Exploring Tradeoffs in Accuracy, Energy and Latency of Scale Invariant Feature Transform in Wireless Camera Networks. In International Conference for Distributed Smart Cameras. September 2007.
- D. Lee, H. Kim, S. Tu, M. Rahimi, D. Estrin, and J.D. Villasenor, "Energy-optimized image communication on resource-constrained sensor platforms," In Proc. IEEE/ACM International Conference on Information Processing in Sensor Networks: Special Track on Sensor Platforms, Tools and Design Methods (SPOTS), pages 216-225, Cambridge, USA, Apr 2007.

- Mohammad Rahimi, Rick Baer, Obimdinachi Iroezi, Juan Garcia, Jay Warrior, Deborah Estrin and Mani Srivastava, Cyclops: In Situ Image Sensing and Interpretation in Wireless Sensor Networks, ACM Conference on Embedded Networked Sensor Systems(SenSys), 2005.
- Richard Pon, Maxim Batalin, Victor Chen, Aman Kansal, Duo Liu, Mohammad Rahimi, Lisa Shirachi, Arun A Somasundara, Yan Yu, Mark Hansen, William J Kaiser, Mani B Srivastava, Gaurav Sukhatme, Deborah Estrin, Coordinated Static and Mobile Sensing for Environmental Monitoring, IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS), 2005.
- Maxim Batalin, William Kaiser, Richard Pon, Gaurav Sukhatme, Gregory Pottie, Yan Yu, Jason Gordon, Mohammad Rahimi and Deborah Estrin, Task Allocation for Event-Aware Spatiotemporal Sampling of Environmental Variables, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2005.
- Mohammad Rahimi, Mark Hansen, William J. Kaiser, Gaurav S. Sukhatme, Deborah Estrin, Adaptive sampling for environmental field estimation using robotic sensors, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2005.
- Karthik Dantu, Mohammad Rahimi, Hardik Shah, Sandeep Babel, Amit Dhariwal, and Gaurav S. Sukhatme, Robomote: Enabling mobility in sensor networks, International Conference on Information Processing in Sensor Networks, 2005.
- Richard Pon, Maxim Batalin, Jason Gordon, Aman Kansal, Duo Liu, Mohammad Rahimi, Lisa Shirachi, Yan Yu, Mark Hansen, William J. Kaiser, Mani Srivastava, Gaurav Sukhatme, Deborah Estrin, Networked Infomechanical Systems: A Mobile Wireless Sensor Network Platform, International Conference on Information Processing in Sensor Networks (IPSN), special track on platforms and tools (SPOTS), 2005.
- Maxim Batalin, Mohammad Rahimi, Yan Yu, Duo Liu, Aman Kansal, Gaurav Sukhatme, William Kaiser, Mark Hansen, Gregory Pottie, Mani Srivastava, and Deborah Estrin, Call and Response: Experiments in Sampling the Environment, ACM Conference on Embedded Networked Sensor Systems (SenSys), 2004.
- Richard Pon, Maxim Batalin, Mohammad Rahimi, Yan Yu, Deborah Estrin, Gregory Pottie, Mani Srivastava, Gaurav Sukhatme, and William Kaiser, Self-Aware Distributed Embedded Systems, IEEE International Workshop on Future Trends of Distributed Computing Systems, 2004.
- Aman Kansal, Mohammad Rahimi, William Kaiser, Mani Srivastava, Gregory Pottie, and Deborah Estrin, Controlled Mobility for Sustainable Wireless Networks, IEEE Sensor and Ad Hoc Communications and Networks (SECON), 2004.
- Yan Yu, Deborah Estrin, Ramesh Govindan, Mohammad Rahimi, Using more realistic data models to evaluate sensor network data processing algorithms, IEEE Workshop on Embedded Networked Sensors 2004.
- Mohammad Rahimi, Richard Pon, William Kaiser, Gaurav Sukhatme, Deborah Estrin, and Mani Srivastava, Adaptive Sampling for Environmental Robotics, IEEE International Conference on Robotics and Automation, 2004.
- Mohammad Rahimi, Hardik Shah, Gaurav Sukhatme, John Heidemann and Deborah Estrin, Studying the Feasibility of Energy Harvesting in a Mobile Sensor Network, IEEE International Conference on Robotics and Automation (ICRA), 2003.

- Gabriel Sibley, Mohammad Rahimi and Gaurav Sukhatme, Robomote: A Tiny Mobile Robot Platform for Large-Scale Sensor Networks, Proceedings of the IEEE International Conference on Robotics and Automation (ICRA), 2002.

TECHNICAL REPORTS

- Shaun Ahmadian, Teresa Ko, Sharon Coe, M P. Hamilton, Mohammad Rahimi, Stefano Soatto, and D Estrin, "Heartbeat of a Nest: Using Imagers as Biological Sensors", Center for Embedded Networked Sensing, 2007
- Karthik Dantu, Mohammad Rahimi, Hardik Shah, Sandeep Babel, Amit Dhariwal, and Gaurav Sukhatme, Robomote: Enabling mobility in sensor networks, Institute for Robotics and Intelligent Systems Technical Report, 2004.
- Mohammad Rahimi, Rohit Mediratta, Karthik Dantu, and Gaurav Sukhatme, A Testbed for Experiments with Sensor/Actuator Networks, Institute for Robotics and Intelligent Systems Technical Report, 2002.

POSTERS

- Evaluation of Imagers in a Biological Sensing Deployment, CENS Annual Research Review and External Advisory Board Meeting, October 2007
- Deep Vision: Experiments in Exploiting Vision in Wireless Sensor Networks, CENS Research Review 2007
- A Wireless Water Level Control System, CENS Research Review 2005.
- The CENS Systems Infrastructure Overview, CENS NSF site visit 2005.
- Lab-Scale Actuated Sensing Testbeds, CENS NSF site visit 2005.
- Strategies for Sampling the Environment, CENS NSF site visit 2005.
- Cyclops, Image Sensing and Interpretation in Wireless Networks, TinyOS Technology Exchange, Berkeley 2005.
- Task Allocation for Event-Aware Spatiotemporal Sampling of Environmental Variables, CENS Research Review 2004.
- Networked Infomechanical Systems (NIMS), CENS Research Review 2004.
- Fidelity Driven Sampling in Environmental Sensing, CENS Research Review 2004.
- The Extensible Sensing System, CENS Research Review 2003.
- Habitat Sensing at the James San Jacinto Mountains Reserve, CENS Research Review 2003.
- Robomote: Sensor Actuator Platform, NEST Retreat, Berkeley 2003.
- Habitat Sensing at the James San Jacinto Mountains Reserve, CENS Research Review 2003.
- Robomote: Sensor Actuator Platform, NEST Retreat, Berkeley 2003.

DEMOS

- Mohammad Rahimi, Shaun Ahmadian, Deborah Estrin. "Cyclops," Invited demo at the National Science Foundation program on Global Environment for Networking Innovations (GENI) Site Visit, Wireless Working Group, Rutgers University, 2006.
- Mohammad Rahimi, Shaun Ahmadian, David Zats, Rick Baer, Deborah Estrin, Mani Srivastava, Jay Warrior, "Network of Cyclops, Image Inference and Interpretation in Sensor Network", ACM Conference on Embedded Networked Sensor Systems (SenSys), 2005.
- Mohammad Rahimi, Rick Baer, Deborah Estrin, Henry Uyeno, Jay Warrior "Demo Abstract: Cyclops, Image Sensing and Interpretation in Wireless Networks" Second ACM Conference on Embedded Networked Sensor Systems (SenSys), 2004.

RESEARCH PRODUCTS

- Cyclops: A low power camera sensor for wireless nodes. A joint effort by Agilent Laboratories, Agilent Technology.
- MDA300: An embedded low power data acquisition device for wireless sensor nodes. A joint effort by Crossbow Technology, Inc. (Xbow).
- Robomote: A tiny mobile robot that can be networked together and can be controlled remotely. Developed in RESL lab at University of Southern California.

PRESS

- "Imagers as sensors," Second Special Focus Supplement on Sensor Networking Technology in M2M Magazine, July/Aug issue 2008.
- "A New Way to see the World," UCLA Engineering News Letter, January 2006.
- "Application snapshots that show how handy a sensor can be," Sensor Magazine, This short article references the tiny data acquisition board I developed with Crossbow Technology and its use in habitat monitoring, August 2004.
- "Environmental Sensing Array At James Reserve Using Mica2 Mote from Xbow Technology," Crossbow Technology Newsletter, This a Crossbow news letter that reference my work with Xbow, April 2004.
- "Smart Sensors Network the world," Scientific American, The Robomote was cited as one of the potential applications of the mica mote, June 2004.
- "Robomote were cited on robots.net and on stargeek.com," April 2004.
- "Robomote, named by NASA Cool Robot of the Week," February 2002.

REVIEW SERVICES

- Technical Program Committee of Workshop on Applications, Systems, and Algorithms for Image Sensing, 2008 (ImageSense 08).
- Technical Program Committee of Spatial Track on Intelligent Robotic Systems (Robot) on 24th ACM Symposium on Applied Computing SAC 2009).
- Technical Program Committee of the Second ACM/IEEE International Conference on Distributed Smart Cameras (ICDSC-08).

- Technical Program Committee of Spatial Track on Robotics: Hardware, Software, and Embedded Systems (RHSES) on 23th ACM Symposium on Applied Computing (SAC 2008)).
- Technical Program Committee of the First ACM/IEEE International Conference on Distributed Smart Cameras (ICDSC-07).
- Reviewer of the ACM Journals of Mobile Computing and Communications (MC2R).
- Reviewer of the First IEEE Workshop on Embedded Networked Sensors(EmNetS).

INVITED AND CONFERENCE TALKS

- Invited talk in the third CENS annual research review (CENS 2005).
- Invited talk in workshop on Sensor Networks at Statistical and Applied Mathematical Sciences Institute (SAMSI 2003).
- Invited talk in Technical Seminar Series at Center for Embedded Networked Sensing (CENS 2005).
- Invited talk in Networked Infomechanical Systems (NIMS) workshop at The 2004 IEEE International Conference on Robotics and Automation (ICRA 2004).
- Invited talk in Networked Infomechanical Systems (NIMS) workshop at Sensor and Ad Hoc Communications and Networks Conference (Secon 2004).
- "Cyclops: In Situ Image Sensing and Interpretation in Wireless Sensor Networks", in the third ACM Conference on Embedded Networked Sensor Systems(SenSys), 2005.
- "Adaptive Sampling for Environmental Robotics", In IEEE International Conference on Robotics and Automation, 2004.

GRANTS AND PROPOSALS

- GEOX, internal proposal at Center for Embedded Networked Sensing.
- University of California Micro proposal on distributed imaging, Primary Investigator: Deborah Estrin
- Agilent Grant, through collaboration with Agilent technology for development of Cyclops platform.
- Xbow Grant Through collaboration with Xbow. The grant was in the form of donation of the platforms.

REFERENCES

- References Available Upon Request