

Affan A. Syed

Goal: *To do fundamental academic research for zero-energy sensor networks utilizing available energy-harvesting mechanisms*

Education:

CS PhD Candidate (Fall 2004 -todate)- Advisor: [John Heidemann](#)

University of Southern California

C.G.P.A.: **4.0**

Current Research: Affiliated with [I-LENSE](#) and SNUSE lab as a GRA at [ISI](#).

PhD Thesis Title: *Understanding and Exploiting the Acoustic Propagation Delay in Underwater Sensor Networks.*

Expected Graduation: May 2009

Masters of Science Electrical Engineering (2003-2004)

University of Southern California

C.G.P.A.: **3.97**

Relevant Courses at USC: Advanced Operating Systems, Sensing and Planning in Robotics, Wireless and mobile networks design and Lab, Analysis of Algorithms, Wireless Sensor Networks, Adv. topics in networking and distributed systems, Broadband Networks, Design & Analysis of computer comm. Networks, Web Programming Languages, Computer communications

Bachelor of Engineering (with Honors) 1998-2001

National University Of Science And Technology (Pakistan)

C.G.P.A: **3.86** (Ranked 3rd in Graduating **Electrical Engineering** Class)

Honors: Dean's list and merit scholarship throughout undergraduate studies for 4 years.

Honors:

1. Member of the [Phi Kappa Phi](#) Honor society.
2. Student member of IEEE and ACM.
3. Awarded the prestigious **TROSS** scholarship, by the Ministry of Science and Technology, Pakistan.

Graduate Papers¹:

1. *Affan A. Syed, Wei Ye, and John Heidemann.* "**Comparison and Evaluation of the T-Lohi MAC for Underwater Acoustic Sensor Networks.**" IEEE Journal of Selected Areas in Communication, V. 26 (N. 12), to appear, December, 2008.
2. *Affan Syed, Wei Ye, and John Heidemann.* "**T-Lohi: A New Class of MAC Protocols for Underwater Acoustic Sensor Networks**", Proceedings of IEEE INFOCOM 2008, Phoenix, AZ, USA. Pages 231-235, April 13-18 2008.
3. *Affan A. Syed, John Heidemann* "**Time Synchronization for High Latency Acoustic Networks**", Proceedings of INFOCOM 2006, Barcelona, Spain. April 2006.
4. *Affan Syed, Wei Ye, Bhaskar Krishnamachari, John Heidemann* "**Understanding spatio-temporal uncertainty in medium access with aloha protocols,**" in Proceedings of the Second ACM International Workshop on Underwater Networks (WUWNet). Montreal, Quebec, Canada, September 2007.

¹ Soft copy for all papers/talks presentations can be found at <http://www-scf.usc.edu/~asyed/pubs.html>

5. John Heidemann, Yuan Li, *Affan Syed*, Jack Wills, and Wei Ye. "**Underwater Sensor Networking: Research Challenges and Potential Applications**". To appear Proceedings of the IEEE WCNC Las Vegas, Nevada, USA, IEEE. April, 2006.
6. Jun Jung Hyun, *Affan Syed*, and Bhaskar Krishnamachari. "**Impact of Capture on Multihop Wireless Networks in an Optimal Rate Control Framework**", Proceedings of Third Annual International Wireless Internet Conference (WICON) October 22-24, 2007, Austin, Texas, USA.

Talks:

1. "Sensor Network Research at USC/ISI" at University of Southern California (USC) Vitterbi Graduate Student Association (VGSA) student-faculty interaction party.
2. "**Wireless Sensor Networks: From Terrestrial to Underwater**", at Lahore University of Management Sciences (LUMS), 25th August, 2005.
3. Guest lecture on "**Challenges and Research in Underwater Sensor Networks**" for the CS551: Computer Communications -- Spring 2007 course taught by John Heidemann.

Selected Class Projects:

1. "**Prediction Based Routing (PBR)**", for the Wireless Networking laboratory (EE579-SP2005) project (*Best Project*).
2. "**Topology Control**", Survey report for Advanced Topics in Networking and Distributed System (CS694- SP2004).
3. "**Modeling Spatial Properties of Sensor Readings for Alternate Localization and Calibration Techniques**", Wireless Sensor Networks (EE599 - SP 2004), final project report (*Best Project*).

Undergraduate Papers:

1. Adeel Abbas, Arslan Ahmed, *Affan Ahmed et.al*, "**A Retargetable Tool Suite For The Design of Application Specific Instruction Set Processors Using a Machine Description Language**", *IEEE International Symposium on Circuits and Systems, ISCAS 2002*, Vol. 1 pp. 425-428, Phoenix, USA, May 2002
2. *Affan Ahmed*, Adeel Abbas "**BPDL - Processor definition language with support for cycle accurate DSP architectures**"¹, 5th IEEE International Multi-Topic Conference, pp. 200-204, Lahore, Pakistan, Dec. 2001. (*Best Student Paper*)
3. Waheed Uz Zaman, *Syed Affan Ahmed et.al*, "**Modeling Of Processor Delay And Overall Reduction In Network Latencies For Real Time, Interactive Applications**", IEEE Student Conference (ISCON), pp. 76-79, Lahore, Pakistan, August, 2002.
4. Adeel Abbas, *Affan Ahmed* "**Object Oriented Parallel Processing**", *In proceedings of IEEE Student Conference (ISCON)*, pp. 89-93, Lahore, Pakistan, August, 2002.
5. Waheed Uz Zaman, *Syed Affan Ahmed et.al* "**Mobile IP based Mobility Based Management for 3G Networks**", symposium proceedings of International Symposium on Wireless Systems and Networks (ISWSN'03) Dhahran, Saudi Arabia, March 24-26, 2003.

Skills:

Programming Languages: C/C++, nesC, Java, Java-Script, CSS, PHP, JSP, mySql, HTML, XML, Perl, Verilog, tcl/otcl.

Platforms: TinyOS, Windows 95/NT/98/2000, Linux, Unix (Sun Solaris), mica2, cricket.

Applications: TOSSIM, Visual C++ / MFC, K-Develop, MS-Office, ns-2.

Web Servers: Apache, Tomcat.

Industry Experience:

Summer Internship at [Sensicast Systems](#) (Needham, MA) May 2004 to August 2004

- Performed in depth analysis of the existing commercial wireless sensor networking platforms, to ascertain suitability for diverse applications. This involved devising and performing tests that exposed the strengths and weaknesses, both technical and commercial, of each platform.

Design Engineer for Avaz Networks (Corp HQ, Irvine, CA) May 2001 to December 2002

- Designed and implemented Point to Point Protocol (**PPP**) using **C** and **Linux** as platform.
- SIP proxy resolution using NAPTR and SRV Records. RAS, VPN, NAT and firewall setup in a **Linux** box for a soft router solution.

Graduate Projects:

- **Simulation of Wireless Sensor Network (WSN):** WSN Simulation with CSMA at MAC layer, One Phase Pull at network layer. (*CS 551*)
- **Underwater Robot Following:** Player/Stage simulation, using kalman filter, comparing two different range/position sensors. (*CS 547*)
- **WSN Project:** Modeling of spatial properties in sensor networks & demonstrating their efficacy in applications such as sensor calibration and node localization. (*EE 599*)
- **Edge Tracking in WSN:** Implementing an edge tracking application on the TinyOS/Mica2 platform with simulation in TOSSIM. (*CS694a*)
- **E-commerce Site:** Design and development of a complete e-commerce site using HTML, JavaScript, Perl/PHP with mySql database. (*CS 571*)
- **Network Queue Simulator:** Simulated Markovian queues to study the effects of queuing, feedback and congestion. (*EE 465*)

Undergrad Projects:

- **MobileIP** implementation on a Linux platform with a Qt based front-end.
- **Token ring** based LAN, designing our own hardware NIC and implementing the protocols.

Leadership/Organizations:

College House Captain: Coordinated social events and maintained general discipline within my house.