Ehsan Hemmati

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Primary Interests

Computer and Communication Networks, Network Security, Routing Algorithms, Internet of Things, Distributed Systems, Cyber Physical System Security

Technical Skills

- **Programming**: C/C++, Python, PERL, Assembly (MIPS), XML, C#, Pascal
- **Network**: TCP/IP, IPv6, IPsec, Routing protocols, AWS, Azure
- **Database**: SQL Server, MS Access, MySQL, Oracle
- **Hardware**: Micro-Controllers, Raspberry Pi, Uno32, VHDL, PSpice
- **Simulators**: Qualnet, NS3, ndnSim, NS2, GN3, RapidNet
- **Other**: LATEX, Git, Jira, gdb, XML

Professional & Research Experience

Research Assistant, Xerox PARC (Palo Alto Research Center) June 2017 – Dec. 2017

- Designed and developed the peer-to-peer firmware distribution system; Decentralized distributed file sharing system - Patent in process. (Distributed systems, Python, Security)
- Designed, implemented, and tested software components of a novel network architecture for cyber-physical systems involving Xerox multifunction devices.
- Designed and implemented the Secure Provisioning and Auto Configuration system for Multifunction devices. (JAVA, SNMP, Network Security)

Wireless Engineer Research Intern, ABB Wireless July 2016 – Dec. 2016

- Investigated different solutions to migrate from IPv4 to IPv6 and enable Security features.
- Investigated IPv6 Routing protocols and Mobility and Security features of IPv6.
- Configured IPv6 module on the kernel (OpenWRT, Linux Kernel, IPv6)
- Integrated DHCPv6 relay and developed DHCPv6 message snooping. (C/C++)

Graduate Student Researcher, UC Santa Cruz Apr. 2014 - Now

- Designed and Implemented Distance Vector Routing in Mobile Ad-Hoc Networks. (NS-3)
- Designed and Implemented a Name-based Link-State routing algorithm. (ICN, NS-3)
- Developed NS3 based Content Centric Network Simulator. (C++, NS-3, ndnSim).
- Implemented a novel Distance Based routing protocol in Qualnet simulator. (C++, QualNet)
- Designed and implemented routing algorithms using declarative networking (NS-3, RapidNet)

Graduate Research Assistant, Azad University *Aug. 2012 - Aug. 2013*

- Designed and developed Multipath Routing Protocol for Mobile Ad-hoc Network (Matlab)
- Implemented RBF based queue management controller for TCP/IP network (NS-2, C++/OTcl)
- Designed and Implemented Artificial Intelligence based queue management algorithm (TCP/IP, Queue management)

Network Optimization Team Leader, Moje Payam March. 2010 - Aug. 2013

- Supervised and designed duties for technical engineers and staff.
- Improved network performance by 4% and customer satisfaction over 40%
- Improved hardware usage rate 80% by traffic balancing and modifying BTS configurations.

Optimization Engineer, TopCom Co Sep. 2008 - March 2010

- Investigated and solved incorrect Half Rate channel assignment problem in low traffic sites using KPI measurements and technical manuals.
- Evaluated and adopted new methods and technologies regarding Radio Network Optimization, Features, Trials, and Tuning.

Software Engineer, Mobile Communication Company Nov. 2007 - Sep. 2008

- Designed a database and wrote automated cell configuration program to expedite new site datasheet generation process. (C#, SQL server)

Education

Ph.D.: Computer Engineering, University of California, Santa Cruz 2013 - Present

- Supervisor: Prof. J.J. Garcia-Luna-Aceves
- Emphasis on *Computer Networks* and *Routing Algorithms*.
- Recipient of Regents Fellowship.
- **Relevant courses**: Computer networks, Network Security, Analysis of algorithm, Optimization theory, Computer Architecture, and Principles of Database Systems.
- **Teaching Assistant:**
  - Computer Systems and Assembly Language (Computer Architect, Assembly - MIPS)
  - Introduction to Networking and the Internet
  - Applied Discrete Mathematics

M.Sc.: Electrical Engineering, Azad University Feb. 2011

- **Thesis**: Multipath Routing Protocol for Mobile Ad-hoc Network
- **Relevant Courses**: Advanced Microprocessors, VHDL, Digital Signal Processing, and Artificial Intelligence.

B.Sc.: Electrical and Electronic Engineering, IUST Sep. 2007

- **Thesis**: Designed and developed Vehicle Controller Board using AT90CAN and Programed the controller to collect measurements and command different modules

Publications

Refereed Papers

- J.J. Garcia-Luna-Aceves and **E. Hemmati**, "Ordered Distance Vector Routing in Mobile Ad-Hoc Networks" submitted to IEEE INFOCOM conference 2019, France, 2019
- **E. Hemmati** and J.J. Garcia-Luna-Aceves, "Making Name-Based Content Routing More Efficient than Link-State Routing," Proc. IFIP Networking 2018, Switzerland, 2018.
- J.J. Garcia-Luna-Aceves, M. Mirzazad, **E. Hemmati**, "Content-Centric Networking at Internet Scale through The Integration of Name Resolution and Routing", ICN 2016.
- ***E. Hemmati***, J.J. Garcia-Luna-Aceves, "A Comparison of Name-Based Content Routing Protocols," Proc. IEEE CCN 2015: IEEE MASS 2015 Workshop on Content-Centric Networks, Dallas, TX, Oct. 19, 2015.
- ***E. Hemmati***, J.J. Garcia-Luna-Aceves, "A New Approach to Name-Based Link-State Routing for Information-Centric Networks," Proc. ACM ICN 2015.
- M. Sheikhan, ***E. Hemmati***, "Reliable multipath routing in mobile ad hoc networks using hybrid computational intelligence algorithms", Book chapter, Dynamic Ad-Hoc Networks, 2013.
- M. Sheikhan, ***E. Hemmati***, "Transient Chaotic Neural Network-Based Disjoint Multipath Routing For Mobile Ad-Hoc Networks," Neural Computing and Applications, vol. 21, Issue 6, 2012.
- M. Sheikhan, R. Shahnazi, ***E. Hemmati***, "Adaptive Active Queue Management Controller for TCP Communication Networks Using PSO-RBF Models," Neural Computing and Applications, 2012.
- M. Sheikhan, ***E. Hemmati***, "High Reliable Disjoint Path Set Selection In Mobile Ad-Hoc Network Using Hopfield Neural Network," IET Communication, vol. 5, Issue 11, 2011.
- ***E. Hemmati***, M. Sheikhan, "Hopfield neural network for disjoint path set selection in Mobile Ad-hoc Networks," Proc. WCSN 2010.

Certificates

Computer Networks (Coursera); SQL Server 2005 Enterprise Edition (Designing and Implementing Databases; Linux administrative; GSM introduction; Principles of Cellular Network Planning Adaptive Multi Rate (AMR) Planning (Nokia); Radio Network Optimization Principles (Nokia); Intelligent Networks: IN Applications for GSM (ZTE); GSM Signaling.