

Farzana Rahman

Email: farzana.rahman@mu.edu

Website: <http://www.mscs.mu.edu/~frahman/>

Cell Phone: 414-469-6005

Graduate Assistant

Dept. of Math., Stat. and Comp. Science (MSCS)

Marquette University

1313 W. Wisconsin Ave

Milwaukee, WI 53233, USA.

Education

PhD in Computational Sciences (2010 - at present)

Dept. of MSCS, Marquette University, Milwaukee, WI.

Current CGPA: 4.00 out of 4.0

Advisor: Prof. Sheikh Iqbal Ahamed

Masters of Science in Computer Science (2008 - 2010)

Dept. of MSCS, Marquette University, Milwaukee, WI.

CGPA: 4.00 out of 4.00

Thesis: Towards Secure And Scalable Tag Search Approaches for Current and Next Generation RFID Systems

Advisor: Prof. Sheikh Iqbal Ahamed

Bachelor of Science in Computer Science and Engineering (2003 - 2008)

Dept. of Computer Science and Engineering, Bangladesh University of Engineering and Technology (BUET)

CGPA: 3.63 out of 4.00

Thesis: Minimizing Broadcast Redundancy for Ad-hoc Wireless Network

Advisor: Prof. A.K.M. Ashikur Rahman

Research Interests

Security and privacy of RFID and computational RFID systems, Data retrieval in RFID systems, Trust and privacy in pervasive computing, Security of wireless sensor networks, and Green Computing

Experience

- *Research Assistant (Spring 2011 - at present)*
 - Advisor : Prof. Sheikh Iqbal Ahamed. Ubicomp Lab, Marquette University. (<http://www.mscs.mu.edu/~ubicomp/>)
- *Webmaster and Assistant of System Administrator (Fall 2010)*
 - Dept. of MSCS, Marquette University.
- *Teaching Assistant (Fall 2008-Fall 2010)*
 - Dept. of MSCS, Marquette University. Courses: Object Oriented Programming, Object Oriented Software Design using JAVA
- *Lecturer (Jan 2008 - May 2008)*
 - Dept. of Computer Science and Engineering, State University of Bangladesh (SUBD), Bangladesh.
- *Reviewer (through Advisor)*
 - ACM Conference on Human Factors in Computing Systems, CHI (2011)
 - IEEE Computer Software and Applications Conference (2009, 2010, 2011)
 - IEEE Transactions on Services Computing (2008, 2009)
 - Journal of Wireless Communications and Mobile Computing, Wiley InterScience (2008, 2009)

Awards and Honors

- *Grace Hopper Scholarship '11* funded by *National Science Foundation*, 2011.
- *Student Travel Grant Award* to attend *ACM CCS '11* funded by *National Science Foundation*, 2011.

- *Computational Sciences Summer Research Program (CSSRP) Fellowship for summer 2011* funded by Marquette University, 2011.
- *CRA scholarship recipient to attend Grad Cohort Workshop*. 2011.
- *Richard Tapia '11 scholarship recipient to attend Richard Tapia Conference*. 2011.
- *Student Travel Grant Award to attend PerCom 2011* funded by *National Science Foundation*. 2011
- *Grace Hopper Scholarship '10* funded by *National Science Foundation*, 2010.
- *Google Anita Borg Scholarship* finalist, 2010.
- *Computational Sciences Summer Research Program (CSSRP) Fellowship for summer 2010* funded by Marquette University, 2010.
- *Student Travel Grant Award to attend ACM CCS '09* funded by *National Science Foundation*, 2009.
- *Travel and Accommodation grant from Illinois Wireless Summer School* at University of Illinois at Urbana-Champaign, 2009.
- *Marquette Graduate Assistantship* (Fall 2008 – Spring 2013).

Publication List

➤ *Journal Papers*

- [JL1]. **Farzana Rahman**, Casey O'Brien, Sheikh I. Ahamed, He Zhang and Lin Liu, “**Design and implementation of an open framework for ubiquitous carbon footprint calculator applications**”, *Elsevier Journal of Sustainable Computing: Informatics and Systems*, Volume 1, Issue 4, December 2011. pp. 2210-5379. <http://dx.doi.org/10.1016/j.suscom.2011.06.001>
- [JL2]. **Farzana Rahman**, Md. Endadul Hoque, and Sheikh I. Ahamed, “**Preserving privacy in wireless sensor networks using reliable data aggregation**”, *SIGAPP Applied Computing Review*, Volume 11, Issue 3, August 2011. pp. 52-62. <http://doi.acm.org/10.1145/2034594.2034599>
- [JL3]. Md. Endadul Hoque, **Farzana Rahman**, Sheikh I. Ahamed, and Jong Hyuk Park, “**Enhancing Privacy and Security of RFID System with Serverless Authentication and Search Protocols in Pervasive Environments**”, *Journal of Wireless Personal Communication*, Springer, Volume 55, Issue 1, 2009. pp. 65-79. <http://dx.doi.org/10.1007/s11277-009-9786-0>
- [JL4]. Ashikur Rahman, Md. Endadul Hoque, **Farzana Rahman**, Sabuj K. Kundu, and Powel Gburzynski, “**Enhanced Partial Dominant Pruning (EPDP) Based Broadcasting in Ad hoc Wireless Networks**”. *Journal of Networks*, Volume 4, No 9, November 2009. pp. 895-904. <http://dx.doi.org/10.4304/jnw.4.9.895-904>
- [JL5]. Sheikh I. Ahamed, Munirul M. Haque, Md. Endadul Hoque, **Farzana Rahman**, and Nilothpal Talukder, “**Design, Analysis, and Deployment of Omnipresent Formal Trust Model (FTM) with Trust Bootstrapping for Pervasive Environments**”, *Elsevier Journal of Journal of Systems and Software (JSS)*, Volume 83, Issue 2, February 2010. pp. 253-270. <http://dx.doi.org/10.1016/j.jss.2009.09.040>
- [JL6]. Sheikh I. Ahamed, **Farzana Rahman**, Endadul Hoque, Fahim Kawsar, and Tatsuo Nakajima, “**Secure and Efficient Tag Searching in RFID Systems using Serverless Search Protocol**”. *International Journal of Security and Its Applications (IJSIA)*, Volume 2, No 4, October 2008. pp. 57-66.

➤ *Conference/Workshop Papers*

- [CF1]. **Farzana Rahman** and Sheikh Iqbal Ahamed, “**DRAP: A Robust Authentication Protocol to Ensure Survivability of Computational RFID Networks**”, to appear in *Proc. of ACM Symposium on Applied Computing (SAC 2012)*. Italy, March, 2012. [Acceptance rate: 24%]
- [CF2]. **Farzana Rahman**, Casey O'Brien, Kristine Manning, Jason Cowdy, Sheikh Iqbal Ahamed, “**Let EcoDrive be Your Guide: Development of a Mobile Tool to Reduce Carbon Footprint and Promote Green Transport**”, to appear in *Proc. of ACM Symposium on Applied Computing (SAC 2012)*. Italy, 2012.
- [CF3]. Md. Endadul Hoque, **Farzana Rahman**, and Sheikh I. Ahamed, “**AnonPri: An Efficient Anonymous Private Authentication Protocol**”, in *Proc. of the IEEE International Conference on Pervasive Computing and Communications (PerCom 2011)*, WA, USA, March 2011. pp.102-110. [Acceptance rate: 11%].

- [CF4]. **Farzana Rahman**, Md. Endadul Hoque, and Sheikh I. Ahamed, "**REBIVE: A Reliable Private Data Aggregation Scheme for Wireless Sensor Networks**", in *Proc. of the ACM Symposium on Applied Computing (ACM SAC 2011)*, Taiwan, March 2011. pp. 439-444.
- [CF5]. **Farzana Rahman**, Md. Endadul Hoque, Ferdous Kawser, and Sheikh Iqbal Ahamed, "**Preserve Your Privacy with PCO: A Privacy Sensitive Architecture for Context Obfuscation for Pervasive E-Community based applications**", in *Proc. of the International Conference on Social Computing (SocialCom10)*, MN, USA, 2010. pp.41-48. [Acceptance rate: 13%].
- [CF6]. **Farzana Rahman**, Sheikh Iqbal Ahamed, Md. Endadul Hoque, Casey O Brian, Lin Liu, He Zhang, "**UCFC Ubiquitous Personal Carbon Footprint Calculation Platform**", in *Proc. of the Workshop for The Work in Progress in Green Computing: (WIPGC 2010)*, Chicago, IL, USA, 2010.
- [CF7]. He Zhang, Lin Liu, Sheikh Iqbal Ahamed, and **Farzana Rahman**, "**Open Carbon Footprint Calculation Platform for Personal Users**", in *Proc. of the Second International Workshop on Software Research and Climate Change (ICSE 2010)*, South Africa, 2010.
- [CF8]. Md. Endadul Hoque, **Farzana Rahman**, and Sheikh I. Ahamed, "**S-Search: Finding RFID Tags using Scalable and Secure Search Protocol**", in *Proc. of the ACM Symposium on Applied Computing (SAC 2010)*, Switzerland, March, 2010. pp. 439-443.
- [CF9]. Md. Endadul Hoque, **Farzana Rahman**, Sheikh I. Ahamed, and Lin Liu, "**Trust Based Security Auto-Configuration for Smart Assisted Living Environments**", in *Proc. of the ACM Workshop on Assurable & Usable Security Configuration (SafeConfig 2009)* collocated with *ACM CCS 09*, Chicago, USA, November, 2009, pp. 7-11.
- [CF10]. Md. Endadul Hoque, **Farzana Rahman**, and Sheikh Ahamed, "**Supporting Recovery, Privacy and Security in RFID Systems Using a Robust Authentication Protocol**", in *Proc. of the 24th ACM Symposium on Applied Computing (ACM SAC 2009)*, Hawaii, USA, March, 2009. pp. 1062-1066.
- [CF11]. Md. Endadul Hoque, **Farzana Rahman**, and Sheikh Iqbal Ahamed, "**An Adaptive Initial Trust and Demand Aware Secure Resource Discovery (AID-SRD) Model for Pervasive Environments**", in *Proc. of the IEEE International Workshop on Web and Pervasive Security (WPS 2009) in conjunction with Percom '09*, Texas, USA, March, 2009. pp. 1-6.
- [CF12]. Sheikh I. Ahamed, Endadul Hoque, **Farzana Rahman**, and Mohammad Zulkernine, "**Towards Secured Trust Bootstrapping in Pervasive Computing Environment**", in *Proc. of the IEEE High Assurance Systems Engineering Symposium (HASE 2008)*, China, December, 2008. pp.89-96. [Acceptance rate 22%]
- [CF13]. Sheikh Iqbal Ahamed, **Farzana Rahman**, and Md. Endadul Hoque, "**ERAP: ECC based RFID Authentication Protocol**", in *Proc. of the IEEE International Workshop on Future Trends of Distributed Computing Systems (FTDCS 2008)*, Kunming, China, October 21-23, 2008, pp.219-225.
- [CF14]. Sheikh I. Ahamed, **Farzana Rahman**, Endadul Hoque, Fahim Kawsar, Tatsuo Nakajima; "**YA-SRAP: Yet Another Serverless RFID Authentication Protocol**", in *Proc. of the IET International Conference on Intelligent Environment (IE08)*, Seattle, USA, July, 2008, pp. 640--.
- [CF15]. Sheikh I. Ahamed, **Farzana Rahman**, Endadul Hoque, Fahim Kawsar, and Tatsuo Nakajima, "**S³PR: Secure Serverless Search Protocols for RFID**", in *Proc. of the IEEE International Conference on Information Security and Assurance (ISA 2008)*, Korea, April, 2008, pp.187-192.
- [CF16]. Sheikh Iqbal Ahamed, **Farzana Rahman**, and Md. Endadul Hoque, "**Secured Tag Identification Using EDSA (Enhanced Distributed Scalable Architecture)**", in *Proc. of the ACM Symposium on Applied Computing (ACM SAC 2008)*, Brazil, March, 2008. pp. 1902-1907.
- [CF17]. Endadul Hoque, **Farzana Rahman**, Sabuj Kundu, Ashikur Rahman and Pawel Gburzynski, "**Enhanced Partial Dominant Pruning (EPDP) Based Broadcasting in Ad hoc Wireless Networks**", in *Proc. of the International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS '08)*, Edinburgh, UK, June, 2008.

➤ *Book Chapter*

- [BC1]. **Farzana Rahman**, Sheikh Iqbal Ahamed, Casey O'Brien, He Zhang, and Lin Liu. "**Evolution of Energy Awareness using an Open Carbon Footprint Calculation Platform (OCFP)**", In *Handbook of energy aware and green computing*, CRC Press, 2011.

➤ Posters

- [PS1]. “**Healthcare Privacy for the People by the People: Investigation of practices and attitudes to Healthcare Data Privacy in Rural Countries**”, in *Proc. of the Forward Thinking Poster Session/Colloquy Presentation*, Marquette University, December 2011.
- [PS2]. **Farzana Rahman**, Md. Endadul Hoque, and Sheikh I. Ahamed, "**ProQuPri: Towards Anonymity Protection with Privacy Quantification for Context-aware Applications**", in *Proc. of the ACM Symposium on Applied Computing (ACM SAC 2011)*, Taiwan, March 2011.
- [PS3]. “**Towards a Lightweight Security Solution for Computational RFID (CRFID)**”, at the 2010 Anita Borg Institute Grace Hopper Celebration of Women in Computing. Atlanta, GA, USA, September 2010.
- [PS4]. “**MonAC : A batch-mode search technique for computational RFID tags**”, in *Proc. of the Forward Thinking Poster Session/Colloquy Presentation*, Marquette University, December 2010, pp. 5.
- [PS5]. “**Towards Green Software Infrastructure**”, in *Proc. of the Forward Thinking Poster Session/Colloquy Presentation*, Marquette University, December 2009, pp. 5.
- [PS6]. “**IMPriv: A Context Aware Privacy Sensitive Instant Messaging (IM) Technique**”, in *Proc. of Computational Sciences Symposium*, Marquette University, April 2009.
- [PS7]. “**PriLoc Service: Privacy Support for Location Based Systems**”, in *Proc. of Computational Sciences Symposium*, Marquette University, April 2009.
- [PS8]. “**Measuring Privacy in Pervasive Computing Environment**”, in *Proc. of ORSP Forward Thinking Poster Session/Colloquy*, Marquette University, November 2008.

Technical Skills

- *Programming Language*: C/C++, JAVA, 80x86 Assembly Language, Shell Script, PL/SQL, PROLOG, HTML, PHP, Verilog HDL.
- *Framework*: Jakarta Struts, JavaServer Faces, JAVA Persistence API.
- *Database*: Oracle 9i, MySQL.
- *Web Server*: ApacheWeb Server, Tomcat, Sun Java Application Server.
- *Modeling Language*: Unified Modeling Language (UML) and ER Diagram (ERD).
- *Operating System*: Linux/Unix, Windows.
- *Tools and Software*: MPI, OpenMP, RMI, JBuilder, JCreator, Sun Java Studio Creator, NetBeans, LaTeX, Microsoft Visio, PSPICE, CircuitMaker, Router Simulator, MATLAB, Lex/Yacc.

Graduate Course List (Major Courses)

- | | |
|---------------------------------|------------------------------------|
| • Network Infrastructure | • Distributed Computing |
| • Component Architecture | • Elements of Software Engineering |
| • Probability | • Parallel & Distributed Computing |
| • Simulation | • Applied Linear Algebra |
| • Applied Mathematical Analysis | • Pervasive Computing |
| • Network Applications | |

Selected Graduate level Projects

1. *PriLoc: Automated Transportation System Using Location Based Services*

A prototype is developed to automate the traditional student transportation system of Marquette University within the campus. Utilizing the location of user’s mobile device and with the help of some LBSs running on the server, PriLoc can automate as well as reduce the complexity of the existing manual system. This project is done under the course “*Distributed Computing*”.

2. *OCFF: Being Green with Real Time Carbon Footprint Calculators*

In an attempt to develop various carbon footprint calculators, in this project, we first developed *Open Carbon Footprint Framework (OCFF)* that maintains a clouded knowledge base and provides the necessary interfaces for software developers to incorporate the latest scientific knowledge regarding climate change into their applications. Based on the OCFF platform, we developed a Ubiquitous Carbon Footprint Calculator application (UCFC) that allows user to be aware of their personal carbon footprint. We used low cost sensors to collect environment parameters and used a mathematical model to determine the carbon footprint of a person in small room/lab.

3. *EcoDrive: Development of a Mobile Tool to Reduce Carbon Footprint and Promote Green Transport*

In this project, we developed a mobile GPS application, EcoDrive, for iPhone that suggests the fuel efficient route to the user. The EcoDrive application runs on Apple iPhone running the iOS operating system and is programmed in Objective C. The data stored on the application side uses Apple's Core Data framework. The application references Google's mapping API to display the map and resolve location using the built in geocoding. Our server side runs a LAMP (Linux Apache MySQL PHP) stack and is programmed in PHP. We have also developed web services as part of OCFF framework. The framework's API processes requests based on the RESTful web services protocol. The framework uses eferences Google's geocoding and mapping API.

4. *A simulator for predicting ecological transition of lakes*

Eutrophication is an increase in the concentration of chemical nutrients in an ecosystem to an extent that increases the primary productivity of the ecosystem. Though any exact model of eutrophication is unknown, increased variance of water phosphorus level is an important clue of regime shift (an state when lake approaches a transition from oligotrophic to eutrophic). In this project, we developed a software or simulator to predict the timing and progression of Lake Eutrophication using a simulated model. Using Gaussian distribution as initial soil phosphorus level, this simulator can predict the timing in years for a lake to turn from oligotrophic to eutrophic state.

Selected Undergraduate level Projects

1. *Automobile Service Center Management System*: It is a web based software that is used for the maintenance of internal transaction of an automobile service center. Different phases of software development such as analysis, design, prototyping, coding, and testing have been followed during its development. Platform: J2EE, Framework: JavaServer Faces, Database: MySQL.

2. *Department Resource Management System*: A large scale web based software that is used to manage resources of a university department. Platform: J2EE Framework: Jakarta Struts 1.1 Database: Oracle 9i, Software tool used: JBuilder, Dreamweaver.

3. *Client-Server Based Interactive Application with Thin Client*: A device interfaced to the PC's parallel port, which acts as the server and accepts user response from the remote client. Server and client can communicate both by wired and wireless (RF) Technology.

Platform: Server side is built using JAVA COMM API in J2SE and Client side software is written in C and then converted to microcontroller's machine code using Keil uVision2. Database: MySQL

4. *Simulator for Analyzing Results of Broadcasting Algorithms in MANET*: A GUI based MANET broadcasting simulator, accepting a graph as input and providing simulation result of PDP, DPDP and EPDP algorithms. Platform: J2SE.

5. *Memory Manager*: Manages memory of Linux system using BUDDY Algorithm. It is implemented by C.

6. *Implementation of File System*: A File system for UNIX operating system is implemented by using C.

7. *Implementation of Different layers of OSI model*: Have Implemented Different layers of OSI model such as Data Link Layer. It is implemented in JAVA.

Reference

Sheikh Iqbal Ahamed
Associate Professor
Dept. of MSCS
Marquette University
Milwaukee, WI, USA.
Phone: 414-288-5222
Email: iq@mscs.mu.edu

Douglas Harris
Professor
Dept. of MSCS
Marquette University
Milwaukee, WI, USA.
Phone: 414-288-3889
Email: doug@mscs.mu.edu

Praveen Madiraju
Assistant Professor
Dept. of MSCS
Marquette University
Milwaukee, WI, USA.
Email: praveen@mscs.mu.edu
