Md. Shaifur Rahman

CONTACT
INFORMATION

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RESEARCH
INTERESTS

Wireless Sensor Network, Systems & Networking, Artificial Intelligence, Computational
Biology

EDUCATION

PhD in Computer Science (2013 to present)
Stony Brook University, NY.
CGPA: 3.54/4.00

M.Sc. in Computer Science & Engineering, 2013
Bangladesh University of Engineering & Technology
CGPA: 3.75/4.00

B.Sc. in Computer Science & Engineering, 2009
Bangladesh University of Engineering & Technology
CGPA: 3.92/4.00
Position: Ranked 4th in a class of 127 students

HONORS AND
AWARDS

- Special fellowship of CS department, Stony Brook University, 2013.
- Dean's List Award for academic excellence in all levels of B.Sc.
- University Merit Scholarship for academic excellence in all levels of B.Sc.

RESEARCH
EXPERIENCE

1. **Path Planning Algorithm for Mobile Data Collector in Wireless Sensor
Network**
[2011 to 2013] Worked with Dr. Mahmuda Naznin and Dr. Yusuf Sarwar Uddin to
minimize the tour-length of a mobile data collector that ferries data from sensor nodes
to a sink in a network. Our algorithm takes as input a TSP-tour, generates a *Label-
covering* tour and contracts the path by linear-shortcutting method up to a point where
one or more points in the tour that are called critical point, can never be skipped. The
complexity of the algorithm except the computation of the TSP tour is $O(n^3)$ where n
is the number of nodes covered by the data collector. The resulting tour reduces path
length, improves data delivery latency and increases network lifetime. An extensive
simulation in Castalia framework of OMNET++ simulator validates our claim. We
also tweaked the MAC layer protocol for communication between the mobile element
and static sensor node to save energy.

2. **Application of Ant Colony Optimization in Energy-efficient Dynamic
Source Routing in WSN**
[2008 – 2009] Worked with Dr. Mahmuda Naznin to test performance of different ACO
algorithms to create on-demand routing paths in WSN for energy-efficient source rout-
ing. Simulation result in NS-2 showed that overloading the computation with a lot of
system parameters does not render much gain in network lifetime. Instead, the naive
ACO algorithm with few simple parameters to reduce the number of cross-road nodes
in the routing paths outperforms all other versions in increasing network lifetime.

PUBLICATIONS	1. Md. Shaifur Rahman and Mahmuda Naznin, "Shortening the Tour-length of a Mobile Data Collector in the WSN by the Method of Linear Shortcut". In Proceedings of the 15th *Asia-Pacific Web Conference (APWEB'13)*, 2013, Sydney, Australia (*LNCS, Springer*)

GRADUATE LEVEL COURSEWORKS IN STONY BROOK UNIVERSITY	❏ Artificial Intelligence ❏ Analysis of Algorithms ❏ Computational Biology

GRADUATE LEVEL COURSEWORKS IN M.SC.	❏ VLSI Layout Algorithms ❏ Wireless Resource Management ❏ Advanced Database Systems ❏ Wireless Ad Hoc Networks ❏ Bioinformatics Algorithms ❏ Neural Networks

PROFESSIONAL EXPERIENCE	**Department of Computer Science & Engineering,** **Bangladesh University of Engineering & Technology** Assistant Professor (On Leave, *June, 2013 to Present*) Lecturer (*June 2009 to May 2013*)

TEACHING EXPERIENCE	**Teaching Assistant in Stony Brook University:** CSE308: Software Development (Fall-2013) and CSE215: Foundations of Computer Science (Spring-2014) **Theory Courses Instructed:** VLSI Design, Artificial Intelligence, Theory of Computation **Lab Courses Instructed:** Technical Writing & Presentation, Artificial Intelligence, Operating Systems, VLSI Design, Database, Microprocessor, Digital Logic Design, Pattern Recognition etc.

TRAINING & WORKSHOP	• Cisco CCNA Instructor's Program for Module 1, 2, 3 & 4 conducted by the Cisco Networking Academy in BUET. • Teacher's Appreciation Program conducted by Directorate of Advisory, Extension & Research Services, BUET.

ORGANIZING EXPERIENCE	• Member of Organizing Committee, Workshop on Algorithms & Computation- WALCOM-2010 & WALCOM-2012 • Trainer & Organizer of Automated SQL Learning & Evaluation workshop 2012, sponsored by Ministry of Education, Bangladesh • Trainer of short-courses in Bangladesh-Korea Information Access Center, BUET • Trainer of Advanced Networking Training Program(Cisco ICND-1 & ICND-2) for employees of IT department, Bangladesh Central Bank

PROJECTS COMPLETED IN GRADUATE CLASSES	**Pre-Overlapper** We implemented a pre-processing step for the De Novo genome assembly of PacBio/ Nanopore short-reads of Bacteria as part of the project work done in CSE549 (Computational Biology) course.

PROJECTS COMPLETED IN UNDERGRADUATE CLASSES	**3D Golf Game in OpenGL & C++** As part of the project assigned in the Graphics Lab, we implemented 3D Golf Game with picturesque terrain of grass, pond, mud etc. and projectile physics and collision detection for game score. **Cellphone-based Voice-controlled Operation of Home Appliances** We captured the voice from cellphone and analyzed it using Microsoft's relevant MSDN library. Using ATmega32 micro-controller, different home appliances like light-bulb,

fan, heater etc was turned on/off and their intensity of operation was controlled.

4-bit Microprocessor

A simple microprocessor that was simulated in Circuit-maker and later implemented in hardware. The feature included execution of 28 instructions of 80×86 processor family, memory protection, multiprogramming etc.

NACHOS Virtual OS Implementation

As part of the task in the operating system lab, we implemented Multiprogramming, Process Management, Console, and elementary system calls of virtual operating system NACHOS.

C Compiler

We implemented a complete compiler for C program using *Lex* and *Yacc* as part of the task in compiler lab.

SKILLS

Programming Language
C/C++, Java, Prolog, Python
Web Development
DHTML, PHP, JSP
Database
Oracle, MySQL
Other Tools
OpenGL, PSPICE, Microwind, Verilog HDL
Technical Writing & Simulation Tools
LaTeX, GNUPlot, MatLab, Network Simulator 2 & 3, OMNET++, OPNET

CO-CURRICULAR
ACTIVITIES

Debating: Participated in Model United Nations Debate - 2002, National Debate Championship - 2000, 2001 & 2002
AIDS Awareness Campaign: Participated in Countrywide AIDS Awareness Campaign for Youths 2002–2004, sponsored by UNICEF.

REFERENCES

Dr. Mahmuda Naznin
Associate Professor
Department of Computer Science & Engineering
Bangladesh University of Engineering & Technology.
Email: mahmudanaznin@cse.buet.ac.bd
Web-page: http://teacher.buet.ac.bd/mahmudanaznin

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