

Md Zahidul Islam

Research interests

Machine Learning, Computer Vision, Data Mining, Formal Verification and Model Checking, High Performance Computing, and Artificial Intelligence.

Education

- 2009–2012 **M.Sc. in Computer Science**,
St. Francis Xavier University,
Department of Mathematics, Statistics, & Computer Science,
Antigonish, NS, Canada.
- 2002–2007 **B.Sc. in Computer Science and Engineering**,
Khulna University,
Department of Computer Science and Engineering,
Khulna, Bangladesh.
- 1999–2001 **Higher Secondary Certificate (HSC)**,
Jhenidah Cadet College,
Science Group,
Jhenidah, Bangladesh.
- passing year
1999 **Secondary School Certificate (SSC)**,
Jhenidah Cadet College,
Science Group,
Jhenidah, Bangladesh.
- July 2012 **Level 2 Certificate in Adult Numeracy**,
The City and Guilds of London Institute.
- June 2012 **Level 2 Certificate in Adult Literacy**,
The City and Guilds of London Institute.

M.Sc. thesis

- title *A tableau-based workflow verification framework for Computation Tree Logic (CTL)*
- supervisor Dr. Wendy MacCaull
- description Workflow management systems (WfMS) provide convenient ways to visualize, analyse and automate work processes. Safety critical systems must ensure an error free workflow execution to ensure the safety of the clients. While formal verification techniques can be used in the development stages to help ensure behavioral properties of such systems, such techniques are generally lacking in workflow tools. We present a framework which allows us to model workflows using a Petri net based modelling tool and translate the model to a tableau style model checker. The framework uses the recently introduced one-pass algorithm, shown to deliver enhanced performance over traditional two-pass strategies in practical applications. A failed tableau will generate a counter model which can aid in debugging. We present a case study involving a health services delivery program, and verify properties written in Computation Tree Logic (CTL).

B.Sc. thesis

title	<i>A new matchmaking algorithm for resource discovery on grid</i>
supervisor	Dr. Rafiqul Islam
description	One of the essential operations in distributed computing is resource discovery. This research is focused on resource discovery systems. A resource discovery service provides mechanisms to identify the set of resources, from a large collection of resources, capable of satisfying the requirements of a particular job. The main objective of this research is to reduce the searching complexity of resource discovery. The matchmaking framework provides a reasonable solution to resource management in a distributed environment; it is composed of four important components as classified advertisement (classad), matchmaker protocol, matchmaking algorithm and claiming protocols. Most of the time required to find a resource depends on the performance of the matchmaking algorithms. A distributed environment introduces a large set of heterogeneous resources which is always changing. The matchmaking algorithms should cope with this highly changing environment. This research introduces a fast and efficient searching method for matchmaking algorithms which also deals with resource heterogeneity. In this thesis, we discuss briefly the working principles of the proposed method and compare the experimental results of the proposed matchmaking algorithm with those of the existing algorithm.

Academic and research experience

2012–present	Assistant professor (full-time permanent faculty), Computer Science and Engineering Discipline, Khulna University, Bangladesh. Courses I conducted <ul style="list-style-type: none">o CSE 2101 Data Structureso CSE 2102 Data Structure Laboratoryo CSE 2203 Computer Architectureo CSE 2208 Assembly Language Laboratoryo CSE 2202 Algorithms Laboratoryo CSE 5403 Machine Learning
2012–2014	Holding Problem Solving Sessions for ACM/ICPC, CSE Discipline, Khulna University
2009–2012	Research assistant, Center for Logic and Information, St. FX University, NS, Canada.
2010–2011	Teaching assistant, Dept. of Math, Statistics and Computer Science, St.FX University, NS, Canada. <ul style="list-style-type: none">o CSCI 235 (Micro-Computers in Science), Winter 2011.o CSCI 256 (Data Struct & Algorithm Analysis), Winter 2011.
2009–2010	Teaching assistant, Dept. of Math, Statistics and Computer Science, St.FX University, NS, Canada. <ul style="list-style-type: none">o CSCI 235 (Micro-Computers in Science), Winter 2010.o CSCI 256 (Data Struct & Algorithm Analysis), Winter 2010.
2008–2012	Lecturer (full-time permanent faculty), Computer Science and Engineering Discipline, Khulna University, Bangladesh. Courses I conducted <ul style="list-style-type: none">o CSE 2101 Data Structures

- CSE 2102 Data Structure Laboratory
 - CSE 3203 Information System Analysis and Design
 - CSE 3204 Information System Analysis and Design Laboratory
 - SOCIO 1201 Basic Computers
 - SOCIO 1202 Computer Application
 - CSE 3201 Database Systems
 - CSE 3202 Database Systems Laboratory
 - PGD-211 Data Structure and Algorithm
 - PGD-212 Visual and Internet Programming
- 2007-2008 Part-time faculty member,
Computer Science and Engineering Discipline, Khulna University, Bangladesh.
- Courses I conducted
- CSE 3103 Software Engineering
 - ECE 2151 Data Structures and Algorithms
 - ECE 2152 Data Structures and Algorithms Laboratory
 - BGE 2151 Computer Programming
 - BGE 2152 Computer Programming Laboratory

Academic and research awards

- 2013–2014 Research grant for a project titled-“Designing an automated land taxation system for Khulna city”. Sponsor- Ministry of Science and Technology, Governemnt of Bangladesh. [Role: Co-Investigator]
- 2009–2011 Graduate research fellowship from the Atlantic Canada Opportunities Agency (ACOA) through the Atlantic Innovation Fund (AIF). [During M.Sc. degree]
- 2009–2011 Teaching assistantship award from the Dean of Sciences, St.FX University. [During M.Sc. degree]
- 2007 Fourth rank with distinction in B.Sc. in Computer Science and Engineering, Khulna University, Bangladesh.
- 2002–2006 Dean’s List in undergraduate study. [During B.Sc. degree]
- 2002–2006 Khulna University merit scholarship for excellent performance in undergraduate study. [During B.Sc. degree]
- 2002–2006 Bangladesh Government Board Scholarship, Bangladesh.[During B.Sc. degree]
- 2001 10th Merit Position among 180,000 examinees in Higher Secondary Certificate Examination (equivalent to CA/US High School Graduation), Jessore Education Board, Bangladesh.
- 1999–2001 Bangladesh Government Board Scholarship, Bangladesh. [During Grades 11- 12]

Research contributions

Refereed journal contributions

- 2012 **Md. Zahidul Islam**, Ahemd Shah Mashiyat, Kashif Nizam Khan and SM Masud Karim, “A Tableau Based Automated Theorem Prover Using High Performance Computing”, in Journal of Computers, Volume 7, Number 3, March 2012, pp. 597-607, Academy Publisher, Oulu, Finland.

- 2008 Md. Rafiqul Islam, **Md. Zahidul Islam** and Nazia Leyla, "A tree based approach to matchmaking algorithms for Resource Discovery", in International Journal of Network Management, Volume 18, Issue 5, pp. 427-436, September/October 2008, Wiley Publishers, Print ISSN: 1055-7148, DOI:10.1002/nem.686.

Refereed conference contributions

- 2014 **Md. Zahidul Islam** and Amit Kumar Mondal, "Towards a Standard Bangla PhotoOCR: Text Detection and Localization", in Proceedings of 17th International Conference on Computer and Information Technology (ICCIT), 22-23 December, 2014, Dhaka, Bangladesh, pp.198-203.
- 2012 **Md. Zahidul Islam** and Wendy MacCaull, "A One-Pass Tableau-Based Workflow Verification Framework", The Third Workshop on Practical Aspects of Automated Reasoning (PAAR-12), associated with the 6th International Joint Conference on Automated Reasoning (IJCAR-2012), Manchester, UK.
- 2010 **Md. Zahidul Islam**, Ahemd Shah Mashiyat, Kashif Nizam Khan and SM Masud Karim, "Towards A Tableau Based High Performance Automated Theorem Prover", International Conference on Computer and Information Technology (ICCIT), 2010, Dhaka, Bangladesh, pp.406-411.
- 2007 Md. Rafiqul Islam, **Md. Zahidul Islam** and Nazia Leyla, "A Matchmaking Algorithm for Resource Discovery on Grid", in proceedings of International Conference on Information and Communication Technology, 7-9 March, 2007, Dhaka, Bangladesh, pp.193-196.
- 2005 Kashif Nizam Khan, **Md. Zahidul Islam**, Jinat Rehana and Md. Saidur Rahman "Development of a Bangla Speech Driven Application", in proceedings of International Conference on Computer and Information Technology, 28-30 December 2005, Islamic University of Technology, Gazipur-1704, Bangladesh, pp.1015-1020.

Non refereed poster presentations

- 2010 **Md Zahidul Islam** and W. MacCaull, "A framework for automated verification of workflow using timed temporal logic in a distributed memory environment", APICS Math/CS Conference, Graduate Session, Halifax.

Under review

- 2014 "A New Approach to Access Control in Cloud" - submitted to Arabian Journal for Science and Engineering (AJSE Engineering)

Working paper

Embedded System Verification

Faster Image Segmentation

Sentiment Analysis

Course projects (as a part of my M.Sc. Degree)

Parallel tableau thorem prover for propositional logic using MPIJava.

An Efficient Approach to Verify Workflow Management Systems in Health Care with Automated Theorem Proving.

A report on "Tractable and Intractable Problems".

Course projects (as a part of my B.Sc. Degree)

Development of a bangla speech driven application using Java.

Library management system of Khulna University using VB.NET, Sql Server 2000 and Crystal Report 9.

Break through a computer game using C and OpenGL.

System Analysis, design and development of a management system for Hotel Bosundhara using Visual basic, MS Access, HTML, ASP.

Graduate courses

- o Theory of Computing(A+)
- o High Performance Computing(A+)
- o Specification & Verification(A+)
- o Artificial Intelligence(B+)

Grading Scale: A+ = 85 to 99, A- = 80 to 84, B = 75 to 79, B- = 70 to 74, C = 65 to 69, C- = 60 to 64, D = 55 to 59, D- = 50 to 54.

Major undergraduate courses

- o Computer Programming(C+)
- o Discrete Mathematics(A+)
- o Algorithms(A)
- o Digital Image Processing(A+)
- o Database Systems(A+)
- o Operating System(A+)
- o Compiler Design(A+)
- o Information Security and Control(A+)
- o Computer Networks(A+)
- o Artificial Intelligence and Expert Systems(A)
- o Computer Graphics and Pattern Recognition(B+)
- o Switching and Finite Automata Theory(A)
- o Object Oriented Programming(A)
- o Data Structure(A)
- o Numerical Methods(A+)
- o Microprocessors(A)
- o Applied Probability(B+)
- o Computer Architecture(A+)
- o Software Engineering(B)
- o Parallel and Distributed Processing(A+)
- o Network Planning(A)

Grading Scale: A+ = 80% or Above, A = 75% to less than 80%, B+ = 70% to less than 75%, B = 65% to less than 70%, C+ = 60% to less than 65%, C = 55% to less than 60%, D+ = 50% to less than 45%.

Online courses

title	Machine Learning,
instructor	Andrew Ng, Stanford University
title	Algorithms, Part I,
instructor	Robert Sedgewick, Princeton University
title	Computing for Data Analysis,
instructor	Roger D. Peng, Johns Hopkins Bloomberg School of Public Health
title	Heterogeneous Parallel Programming,
instructor	Wen-mei W. Hwu, University of Illinois at Urbana-Champaign

Industrial experience

Jun,14–present	Senior Software Engineer, Dot Net Explorer Ltd., Dagenham, United Kingdom.
Responsibilities	Involved in analysis and design of various web-based applications; preparing detailed specification documents with clear project deliverables and timelines; to ensure timely completion of deliverables; participate in meetings regarding project estimation and planning.

Dec, 14–Apr, 15	MIS Expert, European Union Technical Assistance for Sundarban Environmental and Livelihoods Security (SEALS) Project, REF: Europe Aid/129903/C/SR/BD, Bano Bhaban, Boyra, Khulna Circle.
Responsibilities	Providing technical support to the field staffs for the successful implementation of SMIST software. Analyzing the data, collected using the SMIS software during patrolling and generating various reports according to the requirement of the Project Director and Team Leader.
Apr, 10–Jun, 14	Software Engineer, Dot Net Explorer Ltd., Dagenham, United Kingdom.
Responsibilities	Working with members of the development team to develop detailed specification documents with clear project deliverables. Meeting clients regarding project estimation and planning. Producing technical end user documentation and operational procedures with the help of other team members.
Apr, 07–Aug, 09	Web Application Developer, Dot Net Explorer Ltd., Dagenham, United Kingdom.
Responsibilities	Working with Project Managers to build and refine graphic designs for applications, determining appropriate architecture, and other technical solutions. Developing web applications according to user requirements with the guidance of lead software engineer. Preparing technical end user documentation for the clients.
apr-sept., 2008	Software Engineer, Dohatec New Media, Dhaka, Bangladesh.
Responsibilities	As a software engineer my responsibility was to coordinate, solve problems, code and test software, and report to team leader.

Other industrial experience

- 2013 Participated in basic and advanced training program on Embedded System Development, Bangladesh University of Engineering and Technology (BUET).
- 2009 Developed the tabulation system of Khulna University,
This tabulation system is developed following the universal grading system defined by UGC and is being used by all the department of Khulna University for preparing results of the term final exam.
- 2008 Participated in a training program on Object Oriented Programming (OOP), Bangladesh Association of Software and Information Services (BASIS).
The major topics covered in the training program was: Object Oriented Programming (OOP) Fundamental, .NET Programming (C#, ASP.NET), Test driven programming fundamentals with NUnit, Database fundamentals (MSSQL), Understanding basic UML (component diagram, class diagram, activity diagram, sequence diagram), Software development methodology (Waterfall, Agile).
*I achieved the first position in the course with 86% marks.
- 2005 Summer Intern /Industrial Training
Bangladesh Space Research and Remote Sensing Organization (SPARRSO),
Agargaon, Sher-e-Bangla Nagar, Dhaka, Bangladesh.

Computer skills

languages C, C++, SQL, Java, JavaScript, PHP, VB.Net, C#, ASP.Net, HTML.

databases	MS SQL, MySQL, Access.
applications	Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Visio, TEX (LATEX, BibTEX, PSTricks)
model checkers	SMV, DiVinE.
data analysis	Octave, R.

Other activities and interests

Vice President, St.FX Grad Student Society. 2009-2010 Session.

Member, StFX International Student Society.

I have interests in movies, traveling, reading books and photography.

References

Dr. Wendy MacCaull,

Professor, Department of Mathematics, Statistics and Computer Science,
St. Francis Xavier University, Antigonish, NS, Canada.

Email: wmaccaul@stfx.ca

Dr. Md. Rafiqul Islam,

Professor, Head of Mathematics Discipline,
Khulna University, Khulna.

Email: rafiq@math.ku.ac.bd

M A Hasan,

Chief IT Consultant,
Dot Net Explorer Ltd., Dagenham.

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