Ferdaus Ahmed Kawsar

Department of Computing
East Tennessee State University
Johnson City, TN 37614

Mobile: (414) 364-3912
kawsar@etsu.edu

Summary

Two and half years full-time higher education teaching experience in addition to software development experience in the industry. Graduate degrees in Computational Sciences and Undergraduate degree in Computer Science and Engineering. Research and teaching focused on Software Engineering, Machine Learning and Mobile Health. Experience in new course creation and curriculum development.

Education

Ph.D. in Computational Sciences (August 2015)
Dept. of Math., Stat. and Comp. Science
Marquette University, Milwaukee, WI, USA.
Adviser: Dr. Sheikh Iqbal Ahamed, Professor, Marquette University.
Dissertation Title: *Computational Approaches for Remote Monitoring of Symptoms and Activities.*

Ph.D. Dissertation Topic
Title: Computational Approaches for Remote Monitoring of Symptoms and Activities.
The systems and algorithms developed in my dissertation focus on means for remote monitoring using smart phones. The smart phone based remote symptom monitoring system called e-ESAS serves as a working tool to monitor essential symptoms of patients with breast cancer by doctors. The activity detection system allows a remote observer to monitor basic human activities. For the activity detection system, the majority voting fusion technique in multi-sensor architecture is evaluated for eight activities in both single and multiple subject cases. A novel time-delay embedding with expectation-maximization algorithm for Gaussian Mixture Model was developed using data from multiple single sensor cases to reduce computational complexity of activity detection.

M.Sc. in Computational Sciences (January 2012)
Marquette University, Milwaukee, WI, USA.
Thesis Title: *Recognizing Human Physical Activity Using Accelerometers: Current Status and Open Issues*
CGPA: 3.83/4.00

B.Sc. in Computer Science and Engineering (November 2006)
Bangladesh University of Engineering and Technology, Dhaka.
Thesis Title: *Development of a New 3D Graph Drawing Technique for Non-Planar Graphs*

Academic Experiences

East Tennessee State University, Johnson City, TN **[**August 15, 2017- Present]
Assistant Professor at ETSU at the Department of Computing.

- Taught Software Engineering I, Software Engineering II, Machine Learning and Graduate Capstone classes
- Worked as a member of CBAT Scholarship committee for College of Business and Technology
- Worked as a member of Graduate Committee, faculty search committee, systems committee, awards and scholarship committee for Department of Computing
- Conducted research on smart and connected health and health informatics

- Was awarded multiple internal and external grants for conducting research

Medical College of Wisconsin, Milwaukee, WI [February 1,2016-May 1, 2017] **Research Scientist II** at MCW at the department of Neurology.

- Analyzed data from fMRI images, MEG scan using various tools.

Marquette University, Milwaukee, WI **[**Fall 2009- August 2015] **Graduate Assistant** under the supervision of Dr. Sheikh Iqbal Ahamed in Ubicomp Lab. Developed e-ESAS software for "Palliative Care" project. Developed both the patient and doctor module, and the server. Also contributed in the implementation of "Cross-sectional Study" that is being used to collect data from 800 patients. For "Activity Recognition" project, designed and developed software for data collection, data analysis; developed algorithms and evaluated them.

Marquette University, Milwaukee, WI **[**Fall 2010-Spring 2011, Fall 2012] **Research Assistant** of Dr. Iqbal in Ubicomp Lab and was funded by a grant from IBCRF. Worked in different roles in "Ubicare" project. More about the project is available in http://www.mscs.mu.edu/~ubicare/.

Marquette University, Milwaukee, WI [Fall 2009, Fall 2011, Spring 2012, Spring 2014] **Teaching Assistant** at Department of MSCS.

- Worked as TA for *Calculus I, Calculus II, Calculus III, Finite Mathematics, Introduction to Computer Programming (COSC 1010) and Object-Oriented Programming (COSC 1020).*
- Was responsible for teaching in quiz sessions and grading in calculus and finite mathematics classes. For COSC 1010 and 1020, was responsible for lab classes. Prepared lab assignments and evaluated them.

Marquette University, Milwaukee, WI [Spring 2010] **Primary Instructor** at Department of MSCS, Marquette University.

- Was responsible for teaching, evaluating and grading for *Object-Oriented Software Design (COSC 1020)* course.

University of Asia Pacific, **Dhaka, Bangladesh** [November 2008-August 2009] **Lecturer** at Department of CSE.

- Taught *Programming in C and C++, Programming in Java and Microprocessors and Microcontrollers.*
- Instructor at both lab and theory classes.
- Responsible for preparing course material, delivering lectures, preparing exams and tests, grading and preparing results.

State University of Bangladesh, Dhaka, Bangladesh [May 2007-October 2008] **Lecturer at the** Department of CSE of State University of Bangladesh.

- Taught *Numerical Methods, Artificial Intelligence,* and *Digital Logic Design.*
- Was Responsible for preparing course material, teaching, preparing exams and tests, grading and preparing results.

Professional Development (Teaching)

- Attended workshop on "Feedback Early and Often" hosted by Center for Teaching Excellence at ETSU on October 22, 2019.

Academic Mentoring

- Graduate Thesis Chair (2018-2019) Nusrat Jahan Chowdhury

"Design and Development of a Comprehensive and Interactive Diabetic Parameter monitoring System, BeticTrack"

- Graduate Thesis Committee Member (2018-2019) Imran Reza Ananta, Marquette University

"Development of a Fall Risk Assessment Tool Using Gait Analysis"

Mentoring through Research Projects

- I hired several students to work on my research project. I held regular weekly meeting with the students for tracking and monitoring of progress of project work. I worked both as a mentor for the students as well as a Project manager for research project.
- During the Diabetics project, I have mentored one undergraduate students, one temporary worker and one graduate student.
- Worked as a co-mentor with Dr Erdin for two undergraduate students.
- Worked as a co-mentor with Dr Erdin and Dr Zaman (from Regenstrief Center for Healthcare Engineering in Purdue University) for one undergraduate student.
- Worked as a mentor during graduate studies to other graduate and undergraduate students

Recruiting

- I Recruited several student workers, temporary workers to work on my research projects.

Industry Experience

Cisco Systems, San Jose, CA [October 1, 2015-January 2016]
Intern Software Engineer at Technuf, LLC assigned to work projects for Cisco Systems, Inc.

- Worked on the client side of CIC, at Physical Security Business Unit in Cisco.

Cisco Systems, Inc, Sunnyvale, CA [Summer 2013]
Software Engineer Intern at Cisco in the Physical Security Business Unit.

- Responsible for developing different features for the Android Client in IPICS Project.
- Worked as an Android developer and developed Bluetooth interface for BTR-155 Bluetooth remote speaker microphone from Savox.

Uniqa Software &Systems Ltd. , Dhaka, Bangladesh [Nov'06-Feb'07]
Software Engineer at Uniqa S&S.

- Was responsible for *Crystal Reports and related programming.*
- Used C# in .NET platform to prepare Crystal reports and fix bugs for medical software.

Technical Skills

Programming Languages: *C/C++, Java, C#, SQL, Assembly language, Prolog, Shell script, Android Programming, J2ME, OpenMP, Python*

Tools and Software: *OpenGL, Oracle 9i, MySQL, Microsoft Visio, Crystal Report, NetBeans, Microsoft Visual Studio, eclipse, MATLAB, Router Simulator, PSPICE, Quartus, Lex/Yacc, Weka, J2EE, Microsoft .NET, Tomcat, FreeSurfer, FieldTrip, Connectome Workbench, Afni , Jupyter Notebook, Jira, Git, Octave,*

Operating Systems: Windows, Ubuntu Linux, Android OS

Service

Advising

- I advised 10 students in Spring 2019 and 5 students in Fall 2018 with their course selection.

Curriculum Development

- I and Dr. Erdin were responsible for preparing **Major Topics, Outcomes and Assignments** for Internet of Things Course (CSCI 4450) in the Cybersecurity concentration.

Departmental Committees

- Member, Computing Graduate Committee (2018-Present)
- Member, Faculty Search Committee (2017-Present)
- Member, Systems Committee (2019-Present)
- Member, Computing Research Committee
- Member, Awards and Scholarship Committee (2017-2018)

College of Business and Technology Committees

- Member, CBAT Scholarship Committee

University-level Committees

- Member, Computation and Research in Data Science (CaRDS)

Membership

ACM Student Membership, former SIAM Membership, IEEE member

Professional Services

- **General Co-Chair** WISH 2020**:** The 2nd IEEE International Workshop on Integrated Smart Healthcare to be held in Madrid, Spain from July 13-17, 2020.
- **General Co-Chair** WISH 2019**:** The 1ST IEEE International Workshop on Integrated Smart Healthcare held in Milwaukee, Wisconsin, USA July 15-19, 2019.
- **Member**, Program Committee, Pervasive Context-Aware Smart Cities and Intelligent Transportation Systems (PerAwareCity), March 2020.
- **Member,** Graduate Committee, Department of Computing, East Tennessee State University (2018-2019)
- **Member,** Graduate Committee, Department of Computing, East Tennessee State University (2019-2020)
- **Member,** Faculty Search Committee, Department of Computing, East Tennessee State University (2017-2018, 2018-2019)
- **Member,** Computing Awards and Scholarship Committee, Department of Computing, East Tennessee State University (2017-2018)
- **Member,** Awards and Scholarship Committee, College of Business and Technology, East Tennessee State University (2017-2018)
- **Member,** Computation and Research in Data Science, East Tennessee State University (2018-2019)

- **Member**, Program Committee, Mobile Computing and Applications Track, SAC 2017
- **Member**, Program Committee, Mobile, Wearable and Ubiquitous Computing (MOWU) Symposium, IEEE COMPSAC 2017
- **Reviewer**, ACM Symposium on Applied Computing (SAC) 2017
- **Reviewer,** for research articles for International Conference on Networking, Systems and Security (NSysS 2018) held in Dhaka, Bangladesh.

Research

Research Interests

My research focuses on **Computational Analysis,** especially in the area of **healthcare.** My research primarily involves **Mobile Computing**, specifically sensor data analysis, algorithm development and designing and building **mHealth** systems. We now have a unique phenomenon where significant computational power, storage, connectivity, and built-in sensors are carried by many people willingly as part of their life style. Measuring different meaningful parameters of target subjects by analyzing sensor data can be tremendously useful to various stakeholders. My expertise and knowledge in **Software Engineering, Machine Learning and Applied Mathematics** had been useful for analyzing time series data and for developing activity detection systems. I also conducted research in Neurology where I analyzed fMRI, MEG and ECoG data obtained from human brain.

Grants Awarded

- *Calculating Road User Cost for Specific Sections of Highway to Use in Alternative Contracting Projects,* Tennessee Department of Transportation under 2018 Second Call for Research Proposals. $89,909.95. Joseph Shrestha (PI), Mohammad Moin Uddin (Co-Investigator), Ferdaus Kawsar (Co-Investigator)
- *A Mobile-based Remote Diabetes Management System for Providing Precision Care to Patients*, Research Development Committee Major Grant, $10,000, FY 2018-2019, Ferdaus Kawsar (PI) & Saba Aziz (Co-Investigator)
- *Optimizing device-to-device interactions on a decentralized online social network*, Research Development Committee Major Grant, $10,000, FY 2018-2019, Esra Erdin (PI) & Ferdaus Kawsar (Co-Investigator)
- *A Mobile-based Remote Diabetes Management System for Providing Personalized Care to Patients,* Research Development Committee Small Grant, $1500, FY 2017-2018, Ferdaus Kawsar (PI)

Research Professional Development

- Attended Professional Grant Development Workshop in University of Tennessee Chattanooga March 19-20, 2018
- Participated in NSF CISE CAREER Workshop 2019 in NSF Headquarter in Alexandria, VA on April 8, 2019.

Collaborated Research

- Established collaboration with Regenstrief Center for Healthcare Engineering (RCHE) to analyze data from MIMIC -III critical care database.

Conference Attendance

- I attended ACM/IEEE IoTDI 2018 from April 17-20, 2018 in Orlando, Florida
- I attended IEEE COMPSAC 2019 on July 15, 2019 in Marquette University at Milwaukee, Wisconsin as an Organizer and Session Chair of "WISH 2019: The 1st IEEE International Workshop on Integrated Smart Healthcare".

IRB Approval

I obtained IRB approval for the following study from the IRB of ETSU:

"Testing the feasibility of development of activity detection system and other modules of Diabetic Management System"

Awards

- Travel grant awarded from the Department of Computing to attend ACM/IEEE IoTDI 2018 from April 17-20, 2018 in Orlando, Florida
- Travel grant awarded from the Department of Computing to attend IEEE COMPSAC 2019 on July 15, 2019 in Marquette University at Milwaukee
- Grants received for Summer student Research for Summer 2018 from the Department of Computing, East Tennessee State University
- Graduate Travel Award for attending AMCIS 2014 in Savannah, Georgia, USA.
- Best paper award in RACS 2013
- Honorable mention in CHI 2012
- Marquette Graduate Assistantship (Fall 2009 – Summer 2015)
- Computational Sciences Summer Research Program (CSSRP) scholarship Summer '11
- Computational Sciences Summer Research Program (CSSRP) scholarship Summer '12
- Graduate Travel Award for attending MobileHealth workshop of MobiHoc 2012 in South Carolina, USA.
- Best poster award in the Proceedings of the Forward-Thinking Poster Session/Colloquy Presentation, Marquette University, December 2010.
- Dhaka Education Board Secondary Merit Scholarship

Research Projects from Graduate School

Comprehensive Diabetic Care: I have been working to build a system for both patients and providers to create an extra channel between them. The system allows patients to record all major parameters necessary for diabetic management conveniently from their phones. The system allows the doctors to access more accurate, relevant ad frequent patient data for diabetic management and thus help them make better decisions.

Human Activity Recognition: One of my research goals has been the development of software and hard-ware platforms for detecting and measuring different human activities of a remote target subject. This includes developing algorithms from analyzing sensor data, and developing applications involving sensors, smart phones and cloud services. Challenges that I address regarding activity detection includes developing algorithms to **reduce computational cost** by **reducing number of sensors**, ensuring **robustness** and **energy efficiency** while **improving accuracy**. One key objective of my research is designing systems for seamless integration of technology by adopting human-centric approach and accommodating natural human behavior.

Remote Symptom Monitoring System: One of my research goals has been the development of mHealth solution for developing countries. This includes software requirement analysis, feedback-driven system design using feedbacks from end users, software development, deployment and evaluation. I also investigated the unique human computer interaction design considerations that must be addressed while developing for rural, low-literacy population in developing countries.

Brain Data Analysis: I analyze human brain data obtained from various modalities and investigate correlations between behavioral parameters and parameters obtained from brain scans.

Publications

Journal Papers

[1] Farzana Rahman, Md Endadul Hoque, **Ferdaus Ahmed Kawsar**, and Sheikh Iqbal Ahamed: "User privacy protection in pervasive social networking applications using PCO". *International Journal of Social Computing and Cyber-Physical Systems* 1, no. 3 (2012): 242-267.

[2] Adibuzzaman, M., Jain, N., Steinhafel, N., Haque, M., **Ahmed, F.,** Ahamed, S., & Love, R. (2013). "In situ affect detection in mobile devices: a multimodal approach for advertisement using social network". *ACM SIGAPP Applied Computing Review*, *13*(4), 67-77.

[3] Md Munirul Haque, **Ferdaus Kawsar**, Md Adibuzzaman, Md Miftah Uddin, Sheikh I. Ahamed, Richard Love, Ragib Hasan, Rumana Dowla, Tahmina Ferdousy, and Reza Salim: "e-ESAS: Evolution of a participatory design-based solution for breast cancer (BC) patients in rural Bangladesh". In *Personal and Ubiquitous Computing* (2014): 1-19.

Conference/Workshop papers

[1] Alam, T., M. T. Islam, M. Househ, A. Bouzerdoum, and **F. A. Kawsar**. "DeepDSSR: Deep Learning Structure for Human Donor Splice Sites Recognition." *Studies in health technology and informatics* 262 (2019): 236-239.

[2] Alam, T., M. T. Islam, M. Househ, S. B. Belhaouari, and **F. A. Kawsar.** "DeepCNPP: Deep Learning Architecture to Distinguish the Promoter of Human Long Non-Coding RNA Genes and Protein-Coding Genes." *Studies in health technology and informatics* 262 (2019): 232-235.

[3] **Ferdaus Kawsar**, Md Kamrul Hasan, Tanvir Roushan, Sheikh Iqbal Ahamed, William C. Chu, and Richard Love. "Activity Detection Using Time-Delay Embedding in Multi-modal Sensor System." In International Conference on Smart Homes and Health Telematics, pp. 489-499. Springer International Publishing, 2016.

[4] Adibuzzaman, Mohammad, Colin Ostberg, Sheikh Ahamed, Richard Povinelli, Bhagwant Sindhu, Richard Love, **Ferdaus Kawsar**, and Golam Mushih Tanimul Ahsan. "Assessment of Pain Using Facial Pictures Taken with a Smartphone." In *Computer Software and Applications Conference (COMPSAC), 2015 IEEE 39th Annual*, vol. 2, pp. 726-731. IEEE, 2015

[5] **Ferdaus Kawsar**, Md Kamrul Hasan, Richard Love, Sheikh Iqbal Ahamed. "A Novel Activity Detection System using Plantar Pressure Sensors and Smartphone", in COMPSAC 2015, Taichung, Taiwan.

[6**] Ferdaus Kawsar,** Sheikh Ahamed and Richard Love: "Remote Monitoring Using Smartphone Based Plantar Pressure Sensors: Unimodal and Multimodal Activity Detection". ICOST 2014, Denver, Colorado, USA.

[7] Md Haque, Md Adibuzzaman, Md Uddin, **Ferdaus Kawsar**, Sheikh Ahamed, Richard Love, Rumana Dowla, Reza Salim and Tahmina Ferdousy. "Findings of Mobile based Palliative Care System: Towards a Generic Framework for Measuring QoL". In Proceedings of PervasiveHealth 2014, 1-8, Oldenburg, Germany (Nominated for Best Paper Award).

[8] **Ferdaus Kawsar** and Sheikh Ahamed. "Smartphone Based Multimodal Activity Detection System Using Plantar Pressure Sensors". In Proceedings of the 29th Annual ACM Symposium on Applied Computing, pp. 468-469. ACM, 2014, Gyeongju, Korea.

[9] Md Munirul Haque, **Ferdaus Kawsar**, Mohammad Adibuzzaman, Mohammad Miftah Uddin, Sheikh Iqbal Ahamed, Richard Love, Ragib Hasan, Rumana Dowla, Tahmina Ferdousy and Reza Salim, "Barriers for Breast Cancer (BC) Patients in Rural Bangladesh: Design and Deployment of a

Mobile based Solution" in Proceedings of the 20th Americas Conference on Information Systems (AMCIS 2014), August 7 – 10, Savannah, Georgia.

[10] Mohammad Adibuzzaman, Niharika Jain, Nicholas Steinhafel, Munirul M. Haque, **Ferdaus Ahmed Kawsar**, Sheikh Iqbal Ahamed, Love: "Towards in situ affect detection in mobile devices: a multimodal approach". RACS 2013: 454-460 (Best Paper Award)

[11] **Ferdaus Ahmed Kawsar**, Jahangir A. Majumder, Sheikh Iqbal Ahamed, William Cheng-Chung Chu: "Identifying Phases of Gait and Development of Walking Model from Pressure and Accelerometer Data and It's Ramifications in Elderly Walking". ICOST 2013: 273-279

[12] **Ferdaus Kawsar**, Munirul Haque, Mohammad Adibuzzaman, Sheikh Iqbal Ahamed, Md Uddin. "e-ESAS: Improving Quality of Life for Breast Cancer Patients in Developing Countries". In *Mobile Health 2012*, SC, USA, 2012.

[13] Md Munirul Haque, **Ferdaus Kawsar**, Mohammad Adibuzzaman, Sheikh Iqbal Ahamed, Richard Love, Rumana Dowla, David Roe, Syed Hossain, Reza Selim. "Findings of e-ESAS: A Mobile Based Symptom Monitoring System for Breast Cancer Patients in Rural Bangladesh". In CHI 2012, Austin, Texas. (Honorable Mention)

[14] Munirul M. Haque, **Ferdaus Kawsar** , Md. Adibuzzaman, Sheikh I. Ahamed, Richard Love, Rumana Dowla, David Roe, Reza Selim. "Mobile Based health Care Solution for Breast Cancer Patients". In M4D 2012, New Delhi. (Nominated for Best Paper Award)

[15] Chowdhury Sharif Hasan, Mohammad Adibuzzaman, **Ferdaus Ahmed Kawsar**, Munirul M. Haque, and Sheikh Iqbal Ahamed: "PryGuard: A Secure Distributed Authentication Protocol for Pervasive Computing Environment". In Modern Approaches in Applied Intelligence, Springer Berlin Heidelberg, 2011.

[16] Farzana Rahman, Md. Endadul Hoque, **Ferdaus Ahmed Kawsar**, and Sheikh Iqbal Ahamed: "Preserve Your Privacy with PCO: A Privacy Sensitive Architecture for Context Obfuscation for Pervasive E-Community based applications", in Proceedings of the International Conference on Social Computing (SocialCom10), MN, USA, 2010. [Acceptance rate: 13%]

Conference Presentation

[1] Nusrat Chowdhury, Mohammad A Hoque, **Ferdaus Kawsar,** Clayton Davis, Mohsen Kamrani, Asad J. Khattak. Real-Time Alerting of Hazardous Driving Behavior using Internet of Things (IoT) and Connected Vehicles. *Presented in 2018 ITS America Annual Meeting, Detroit.*

Manuscript Under Preparation

[1] **Ferdaus Kawsar**, Mohammad T Islam, Mohammad T Alam. "Automatic Selfie detection with deep learning approaches." *(Manuscript under preparation for submission in COMPSAC 2020)*

[2] Imran Reza Ananta, Sheikh Ahamed, **Ferdaus Kawsar**. "Development of a Fall Risk Assessment Tool Using Gait Analysis." *(Manuscript under preparation for submission in COMPSAC 2020)*

Posters

[1] "Development of the College of Public Health Indicator Visualization Tool". Jean-Marie Nshimiyimana, Oluwafeyisayo Oyeniyi, Mathew Seiler, Kimberly Hawkins, Temitope Adeyanju, Melissa White, Ferdaus Kawsar, Randy Wykoff. The 2019 Appalachian Student Research Forum. Johnson City, TN.

[2] "Design and Development of a Comprehensive and Interactive Diabetic Parameter Monitoring System.". Nusrat Chowdhury, Joseph Blevins, Phoenix Ragsdale, Tahsin Rezwana, Ferdaus Kawsar, The 2019 Appalachian Student Research Forum. Johnson City, TN.

[3] Epilepsy Connectome Project: Resting-State Connectivity Dynamics in Temporal Lobe Epilepsy Gengyan Zhao, Jed Mathis , VEENA NAIR , Andrew Nencka , Gyujoon Hwang , Megan Rozman ,

Taylor McMillan , Dace Almane , **Ferdaus Kawsar** , Mohsen Mazrooyisebdani , Elizabeth Felton , Aaron Struck , Rama Maganti , Lisa Conant , Colin Humphries , Bruce Hermann , Manoj Raghavan , Edgar DeYoe , Vivek Prabhakaran , Jeffrey Binder , Beth Meyerand, Rasmus Birn. 23rd Annual Meetings of the Organization of Human Brain Mapping, Vancouver, Canada. June 25-29, 2017.

[4] Investigating resting state connectivity alterations in temporal lobe epilepsy with machine learning. Gyujoon Hwang, Jed Mathis , VEENA NAIR , **Ferdaus Kawsar** , Rosaleena Mohanty , Gengyan Zhao , Megan Rozman , Taylor McMillan , Dace Almane , Andrew Nencka , Mohsen Mazrooyisebdani , Elizabeth Felton , Aaron Struck , Rasmus Birn , Rama Maganti , Lisa Conant , Colin Humphries , Bruce Hermann , Manoj Raghavan , Edgar DeYoe, Jeffrey Binder , Beth Meyerand , Vivek Prabhakaran. 23rd Annual Meetings of the Organization of Human Brain Mapping, Vancouver, Canada. June 25-29, 2017.

[5] Functional Connectivity Asymmetries Underlying Language Lateralization Jeffrey Binder , Jed Mathis , **Ferdaus Kawsar**, VEENA NAIR , Megan Rozman , Taylor McMillan , Dace Almane , William Gross , Peter Kraegel , Gyujoon Hwang , Gengyan Zhao , Lisa Conant , Edgar DeYoe , Andrew Nencka , Rasmus Birn , Vivek Prabhakaran , Colin Humphries , Leonardo Fernandino , B. Ward , Rama Maganti , Bruce Hermann , Manoj Raghavan , Beth Meyerand. 23rd Annual Meetings of the Organization of Human Brain Mapping, Vancouver, Canada. June 25-29, 2017.

[6] "Design and Deployment of e-ESAS: A mobile based symptom monitoring system for Breast cancer patients in Rural Bangladesh", Munirul Haque, Sheikh Iqbal Ahamed, Rumana Dowla, **Ferdaus Kawsar**, Mohammad Adibuzzaman, Miftah Udiin, Reza Salim, Richard R. Love. In Proceedings of 34th Great Lake Biomedical Conference, Milwaukee, WI, USA. April, 2012.

[7] "Findings from the Deployment of e-ESAS: A Remote Symptom Monitoring System for Rural Breast Cancer Patients in Bangladesh", Md Munirul Haque, **Ferdaus Kawsar**, Mohammad Adibuzzaman. In Proceedings of the Forward Thinking Poster Session/Colloquy Presentation, Marquette University, December 2011.

[8] "Healthcare Privacy for the People by the People: Investigation of Practices and Attitudes to Healthcare Data Privacy in Rural Countries", Farzana Rahman, **Ferdaus Ahmed Kawsar**. In Proceedings of the Forward Thinking Poster Session/Colloquy Presentation, Marquette University, December 2011.

[9] "Accurate Estimation of Future Health Risk: Building a Model to Estimate Future Health Risk from Activity Data from Cell Phones", **Ferdaus Ahmed Kawsar**, Weiqiang Wang, Casey O'Brien. In Proceedings of the Forward Thinking Poster Session/Colloquy Presentation, Marquette University, December 2011.

[10] "Multimodal Ubiquitous Affect Detection for Social Network", Mohammad Adibuzzaman, **Ferdaus Ahamed Kawsar**, Md Munirul Haque, Md Osman Gani, Nicholas Steinhafel. In Proceedings of the Forward Thinking Poster Session/Colloquy Presentation, Marquette University, December 2011.

[11] "TAGS: Towards Abnormality in Gait Using Smartphone", A.K.M. Jahangir Majumder, William Ebel Jr., Md. Osman Gani, and **Ferdaus Kawsar**. In Proceedings of the Forward-Thinking Poster Session/Colloquy Presentation, Marquette University, December 2011.

[12] "The Amader Gram Breast Care Palliation Study: Phase 1", **Ferdaus Kawsar**, Mohammad Tanviruzzaman, Md. Munirul Haque, and Mohammad Adibuzzaman. In Proceedings of the Forward-Thinking Poster Session/Colloquy Presentation, Marquette University, December 2010. (Best Poster Award).

[13] "Distributed Authentication in Pervasive Computing Environment" **Ferdaus Ahmed Kawsar** and Chowdhury Sharif Hasan. In Proceedings of the Forward-Thinking Poster Session/Colloquy Presentation, Marquette University, December 2009.

Projects

Graduate Projects

Symptom Monitoring of Remote Patients (J2ME on the client side and Java and MySQL on the server side): A system for monitoring remote patients using cell phones. Designed and developed an application for Nokia X6 phones for patients to transmit information to a server. Doctors use the application to retrieve the information from the HIPAA compliant cloud server. The information is presented using charts and graphs to the doctors. This application was specially developed for developing countries with the goal of reducing visits to doctors where it is difficult for patients to visit doctors regularly. We deployed the system in Bangladesh for a pilot study involving 10 patients in. We adopted a feedback-driven process in designing the UI to accommodate low-literacy users. Client modules (patient and doctor modules) were developed using J2ME whereas Web Services in Netbeans were used and SQL Server was used as the database server. Findings from this project have been published to different conferences including one in CHI 2012. In the second phase, the system has been converted to Android platform for a cross-sectional study involving 1100 patients from three countries.

Accurate Activity Detection Using Multiple Sensors (Java for Android OS, Weka and Matlab): A plantar pressure based human activity detection system was developed that can detect three basic human activities unobtrusively. The system is unobtrusive and poses no hindrance to natural human behavior unlike smart phone-only solutions. As the summary of activities are transmitted to a cloud server, a remote observer can view the daily activity summary of a target subject. To improve the accuracy of the system and to accommodate more activities, we developed a majority voting algorithm that works in a multi-sensor environment. We evaluated the performance of our algorithm for both single and multiple subject cases for eight activities and achieved very good accuracy. Machine learning algorithms were used for learning the classifiers. We also developed a novel approach to reduce the required number of sensors by using maximum likelihood with Gaussian Mixture Models. The mixture models are developed from time-delay embedding of sensor data. The project was funded by a grant from IBCRF. The project was also partially funded by CSSRP scholarship from the department of MSCS.

Cross-sectional Study (Java for Android OS, Java and MySQL on the server side): Previously mentioned remote symptom monitoring system was extended for a cross-sectional study involving larger population (1100). The remote symptom monitoring system was developed in Android platform along with some additional features. Part of goal of the system is to collect images for a new pain tool. Along with ESAS questionnaire, the users will submit the image of their facial expression from their android phones. We used **ksoap** for communication between android client and Tomcat 6 server. Images were converted to byte array to string and restored on the server side and stored in a dedicated place. In the cross-sectional study, the extended and modified system was used to collect data from 1100 patients from Nepal, Bangladesh and USA. The goal is to analyze the collected data in future. The project was funded by a grant from International Breast Cancer Research Foundation (IBCRF).

PCO: A Privacy Sensitive Architecture for Context Obfuscation (Java): A privacy sensitive instant messenger was designed and developed for pervasive online community based applications. The obfuscation process uses an ontological description stating granularity of the instances to support multiple levels of granularity. The status of a person would be shown differently depending on his/her relationship with the person he is communicating. A close friend would be able to view detailed status (higher granular) whereas the employer (formal relationship) would view a generic status (lower granular). The status is automatically updated from information collected through a Tmote sensor which can sense eight parameters (in our case, we sensed only visual light). This work was done as a project under the course Elements of Software Engineering (MSCS6050).

Simulation Projects (Matlab): Random number generation (using linear congruent generator and shuffle table), Random number generation using rejection method, finding integrals using Monte Carlo integration with random numbers and importance sampling, simulating a magnetic dipole system and simulation of crystal growth in a supersaturated fluid using kinetic Monte Carlo method.

Undergraduate Projects

Software Projects

Library Management System (C# in .NET)

This system was implemented on the Microsoft .NET framework with Oracle 9i used as the database server. Some of the functions include adding books, borrowing books, searching by book name or author name or subject name.

Compiler: A mini compiler that can compile C codes. LEX/YACC tools have been used for parsing and grammar matching. The compiler can detect syntax errors and provide useful suggestions.

Calculator(C): Given an expression as input it evaluates the expression and outputs the value of the expression. It could handle addition, subtraction, multiplication and division. It could also handle parentheses.

DOS (Assembly languages): Like the real command prompt it had many commands. Additionally it could create and delete files and folders in groups.

Simulation of Memory Manager and File System of OS: It could allocate and deallocate memory blocks ranging from 1 KB to 8 KB.

Cricket Club Management System (Java): Given a scorecard, it could automatically update players' profile.

Card game Hearts (Java): A multiplayer game of card game, Hearts, implemented in Java.

Hardware Projects

Booth's Multiplier: Multiply two 4 bit binary numbers according to Booth's algorithm

4 bit Microprocessor: A 4 bit, multi cycle, two-stage pipelined and micro programmed architecture supporting 28 basic instructions. It is built on simple IC's like ALU, RAM, ROM, MUX, Counter, Register, basic gates etc.

Wireless Arrow Keys (C): For Interfacing Course, we developed 4 arrow keys with four push buttons. The data was transmitted by IR transmitter and receiver. The cursor would move according to input from the arrow keys.

Graduate Courses

Simulation, Applied mathematical Analysis, Data Mining, Elements of Software Engineering, Parallel and Distributed Computing, Probability, Linear Algebra, Pervasive Computing, Component Architecture, Research Methods/Professional Development, Chaos and Nonlinear Signal Processing, Machine Learning (Online)

Some Undergraduate Courses

C, C++, OOP (Java), Data Structures, Digital Logic Design, Algorithms, Assembly language Programming, Database, Software Engineering, Artificial Intelligence, Pattern Recognition. A complete list of courses can be found in the following link: http://www.buet.ac.bd/Syllabi/cse/cse05/syllabus.html