Raiful Hasan

1424 11th Street South, Apt J, Birmingham, AL 35205
raiful@uab.edu (417) 763 8192 /in/hasanraiful raifulhasan.com

SUMMARY

- NSF GRSP Fellow, PhD student in Computer Science.
- Research interest: Mobile and wearable computing, human computer interaction, Internet of Things, machine learning, distracted pedestrian safety, and bystanders privacy.
- Five years industry experience in mobile application development, software design, debugging, and issue fixing
- Expertise in algorithms, data structures, and programming.

EDUCATION

Doctor of Philosophy in Computer Science January 2019 - Present
The University of Alabama at Birmingham
Advisor: Prof. Ragib Hasan

Bachelor of Science in Computer Science & Engineering June, 2012
University of Dhaka, Bangladesh
Thesis Supervisor: Prof. Hafiz Md. Hasan Babu

RESEARCH AND INDUSTRY EXPERIENCE

Graduate Research Assistant January 2019 - Present
UAB SECRETLab, University of Alabama at Birmingham.
Responsibilities: Research

- Working on developing a safety system with preserving privacy for pedestrians.
- Developed ad-hoc emergency alert system for smart cities using Internet of Things (IoT).
- Developed a framework for providing timely alerts to distracted pedestrians. The research work also focuses on user activity recognition through the sensor data using machine learning algorithms.

Software Engineer September 2012 - December 2018
Divine IT Limited
Responsibilities: Research, Development, and Team Management.

- Worked in Core4VoIP mobile dialer development team, which is used by ~200 service providers (~18 countries, mainly in Middle East and South Asia). More than 2 million downloads in Google Play.
- Worked on Voice over Internet Protocol (VoIP), Virtual Private Network (VPN), Geo-Blocking, Session Initiation Protocol (SIP), SoftSwitch, Load Balancing, VoIP Auth server, etc.
- Developed 7 mobile applications focused on geofencing, big data analytic, pattern recognition, machine learning, and networking.

Software Engineer June 2012 - August 2012
JICA Bangladesh
Responsibilities: Software Development

- Worked in automated fare system using smart card for Bangladesh Road Transport Corporation and Bangladesh Railway.
- Implement Pay as You Go fare collection system, which increases profit by more than 7% overall.
- Implemented crowd monitoring analytics by card usage to alleviate delays in rush hour.

TEACHING EXPERIENCE

Department of Computer Science, University of Alabama at Birmingham

Spring 2022	**Guest Lecturer**, Discrete Structures (CS 250) - Topic: The Foundations: Logic and Proofs
Fall 2019 Spring 2020 Spring 2021	**Teaching Assistant,** Discrete Structures (CS 250) - Course Description: An undergraduate-level course that covers propositional and predicates logic, sets, relations, functions, counting, elementary graph theory, proof techniques. - Number of Students: 78 - 90 - Responsibilities: Held weekly office hours and assisted students with assignments. Graded assignments and classwork.
Fall 2020	**Teaching Assistant,** Algorithms and Data Structures (CS 303) - Course Description: An undergraduate-level course that teaches techniques for the design and analysis of algorithms and various data structures. - Number of Students: 43 - Responsibilities: Assisted in lab sessions by providing hands-on coding experience using Java and Python.
Summer 2020 Summer 2021	**Teaching Assistant,** Cloud Computing (CS 733) - Course Description: A graduate course that teaches cloud computing architectures and programming paradigms, theoretical and practical aspects of cloud programming. - Number of Students: 82 and 77 - Responsibilities: Taught lab sessions, held regular office hours, graded homework, project, and exams.

SELECTED PROJECTS

- **X-Fidence:** An IoT-assisted real-time crowd monitoring system in the smart city. The system offers a platform of a citywide network of several places to create a robust monitoring application.
- **InSight: Ad-hoc Emergency Warning System:** BLE beacons and smartphones-based system to locate and circulate any warning marked by an emergency responder without internet or cellular network.
- **StreetBit:** A framework for providing timely alerts to distracted pedestrians using Bluetooth beacons and smartphones. The research work also focuses on user activity recognition through sensor data using machine learning algorithms.
- **Preemptive Construction Site Safety (PCS2):** Real-time location tracking, trajectory prediction, and prevention of potential collisions between workers and site hazards.
- **Security Analysis and Threat Modeling:** Investigated the security and vulnerabilities of video conferencing technology, identified cost-effective mitigation techniques.
- **Question Similarity Detection Using LSTM:** Implemented an LSTM based architecture for Natural Language Processing that can detect duplicate questions if they have the same intent; achieved an accuracy of 82.65%.
- **Sentiment Analysis using Twitter Data:** Analyzed the positive and negative sentiment of the people of Los Angeles are regarding COVID-19 from ~250k tweets using bidirectional LSTM, CNN-LSTM, and ResNet.
- **Core4VoIP Mobile Dialer**: A SIP dialer for the Android operating system. It is designed to work in low bandwidth areas; the voice goes as IP packets through the Internet.
  Technology**:** SIP, VoIP, VPN, Load Balancing, Authentication, Geo-Blocking.
- **Core4Xtreme:** An application for free calls, instant messaging, group conversation, audio and video conferencing with all types of file sharing (image, doc, pdf, ppt, txt, etc.).

Technology: SIP, VoIP, VPN, Openfire Server, P2P Call, P2P Messaging, etc.

- **Business Directory Bangladesh:** Designed and developed directory application for businesses in Bangladesh with 1 million addresses and phone numbers.
  Technology: Large SQLite Database, Google APIs, Notification, Call manager, Phone state.
- **Mobile Application for Newspapers:** Designed and developed three Android mobile application for the daily newspaper. [Kaler Kantho] [Bangladesh Pratidin] [Daily Sun]
  Technology: SQLite Database, Remote Connection, Notification, JSON, Caching.

SELECTED PUBLICATIONS

An up-to-date list is available on Google Scholar.

1. **Raiful Hasan,** Aminul Hoque, Yasser Karim, Russell Griffin, David Schwebel, and Ragib Hasan, "Someone to Watch Over You: Using Bluetooth Beacons for Alerting Distracted Pedestrians", in IEEE Internet of Things Journal, 2022.
2. **Raiful Hasan** and Ragib Hasan, "Pedestrian Safety Using the Internet of Things and Sensors: Issues, Challenges, and Open Problems", in Future Generation Computer Systems Journal, 2022.
3. **Raiful Hasan** and Ragib Hasan, "X-Fidence: Post-Pandemic Wellness By Density Monitoring with Privacy Preserving", in proceedings of the IEEE Consumer Communications & Networking Conference (CCNC), 2022.
4. **Raiful Hasan** and Ragib Hasan, "Towards a Threat Model and Privacy Analysis for V2P in 5G Network", in proceedings of the IEEE 5G World Forum, 2021.
5. David C. Schwebel, Ragib Hasan, Russell Griffin, **Raiful Hasan**, Aminul Hoque, Yasser Karim, Kevin Luo, Anna Johnston, "Reducing Distracted Pedestrian Behavior using Bluetooth Beacon Technology: A Crossover Trial", Journal of Accident Analysis and Prevention, 2021.
6. **Raiful Hasan** and Ragib Hasan, "FinderX: A Bluetooth Beacon Based System for Designing Sustainable Green Smart Cities", IEEE Consumer Electronics Magazine, 2021.
7. **Raiful Hasan**, Ragib Hasan, and Tanveer Islam, "InSight: A Bluetooth Beacon-based Ad-hoc Emergency Alert System for Smart Cities", in Proceedings of the IEEE Consumer Communications & Networking Conference (IEEE CCNC), Flamingo, Las Vegas, Nevada, USA, 2021.
8. **Raiful Hasan** and Ragib Hasan, "Towards a Threat Model and Security Analysis of Video Conferencing Systems", in Proceedings of the IEEE Consumer Communications & Networking Conference (IEEE CCNC), Flamingo, Las Vegas, Nevada, USA, 2021.
9. **Raiful Hasan**, Aminul Hoque, Yasser Karim, Russell Griffin, David Schwebel, and Ragib Hasan, "StreetBit: A Bluetooth Beacon-based Personal Safety Application for Distracted Pedestrians", in Proceedings of the IEEE Consumer Communications & Networking Conference (IEEE CCNC), Flamingo, Las Vegas, Nevada, USA, 2021.
10. **Raiful Hasan** and Ragib Hasan, “Bluetooth Low Energy (BLE) Beacon-Based Micro-Positioning for Pedestrians Using Smartphones in Urban Environments”, In Precision Positioning with Commercial Smartphones in Urban Environments, 2021.
11. **Raiful Hasan** and Ragib Hasan, "BeaCloud: A Generic Architecture for Sustainable Smart City using Bluetooth Beacons", in Proceedings of the 18th IEEE International Conference on Smart City (SmartCity 2020), Yanuca Island, Fiji, 2020.
12. **Raiful Hasan**, Aminul Hoque, Yasser Karim, Russell Griffin, David Schwebel, and Ragib Hasan, "Smartphone-based Distracted Pedestrian Localization using Bluetooth Low Energy Beacons", in Proceedings of the IEEE SouthEastCon, Raleigh, NC, 2020.

13. **Raiful Hasan** and Ragib Hasan, "Towards Designing a Sustainable Green Smart City using Bluetooth Beacons", in Proceedings of the IEEE 6th World Forum on Internet of Things (WF-IoT), New Orleans, LA, 2020.

14. Khandakar M. Rashid, Songjukta Datta, Amir H. Behzadan, and **Raiful Hasan**, "Risk-Incorporated Trajectory Prediction to Prevent Contact Collisions on Construction Sites" Journal of Construction Engineering and Project Management (JCEPM), 2018.

AWARDS AND ACHIEVEMENTS

2022	Sigma Xi, The Scientific Research Honor Society Grants In Aid of Research (GIAR)
2022	Professional development Grant by UAB Graduate Student Government.
2021-22	Recipient of the NSF-EPSCoR GRSP fellowship.
2019	Awarded with the full-tuition scholarship at UAB
2014	Innovation Fund from Access to Information (a2i) and ICT Division of Bangladesh.

TECHNICAL SKILLS

- Languages: Java, C, Python, Swift, Shell Programming
- Database: MySQL, SQLite, PostgreSQL, Oracle
- Operating System: Mac OS X, Windows, Linux, **Android,** iOS
- Protocol and APIs: SIP, VoIP, Room, OKHTTP, Retrofit, Geofence, NLTK, JSON, XML, REST
- Version Control: SVN, Git, JIRA

RESEARCH GRANTS

1. Title: Drone Assisted Ad Hoc Public Alert System in Emergency Management.
   Grant Agency: Sigma Xi, The Scientific Research Honor Society Grants In Aid of Research (GIAR).
   Awarded: $1000. 2022.

2. Title: **Bluetooth Low Energy Assisted Secure Warning System for Emergency Management.**
   Grant Agency: Alabama EPSCoR (Established Program to Stimulate Competitive Research) through Graduate Research Scholars Program (GRSP).
   Awarded: $25,000. 2021.

LEADERSHIP EXPERIENCE / PROFESSIONAL SERVICES

2022	**Feature Editor**, XRDS (The ACM's magazine for students)
2020 - 2022	**Reviewer.** - IEEE BigData, 2021 - IEEE Internet of Things Journal, 2021 - WFIoT, 2021 - IEEE CCNC, 2021
2018 - Present	**Student Member.** - IEEE Student Member - ACM Student Member
2021 - Present	Associate Member of Sigma Xi
2019 - Present	Senator of Graduate Student Government at UAB (GSG)
2020 - 21 & 2021 - 22	**Budget Committee Voting Member,** Graduate Student Government at UAB (GSG)