Shegufta Ahsan, PhD.

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With a well-rounded perspective in Software Engineering, Distributed Systems, Cloud Computing, ML Infrastructure, Internet of Things, and Smart Home, I bring a comprehensive understanding of technology. My academic journey led me to a PhD in Distributed Systems from the University of Illinois at Urbana-Champaign, where, I had the privilege of collaborating with the Microsoft Service Fabric team as a part of my research. As a software engineer with Amazon Alexa and Amazon AWS teams, I deepened my understanding of large-scale, low-latency, fault-tolerant distributed systems. My commitment to making a difference in the ever-evolving tech landscape comes from a blend of what I've learned in academia and experienced in the industry.

Selected Work Experiences

Jul'20 - Present **SDE-II at Amazon**.

- Implemented both internal and public-facing features for AWS Sagemaker:
  - Public Feature 1: EMR Cluster Lifecycle Management backend + python SDK
  - Public Feature 2: Selective Step Execution backend + python SDK.
  - GitHub Repo: `https://github.com/aws/sagemaker-python-sdk`
- Optimized Alexa Entity Disambiguation pipeline.
- Developed features for Amazon Kid's backend infrastructure and mobile app.
- Optimized Amazon's in-house time-series database used by Amazon Fulfillment Center.
- Handled on-call incidents for the above mentioned services.

Jan'14 - Apr'20 **Research Assistant - Distributed System**.

- **Microsoft Service Fabric:** Analyzed and measured the performance of "MS Service Fabric"- a distributed framework for building microservice-based applications *(in collaboration with Microsoft)*.
- **Safe Home:** Addressing limitations in current smart IoT ecosystems, my research achieved enhanced reliability and user experience by providing solutions to consistency and isolation issues.

May'17 - Aug'17 **Intern - Microsoft Azure**.

Designed and developed a failure resilient microservice-based Linearizability Checker to check and validate Azure Service Fabric's Reliable Collection.

May'16 - Aug'16 **Intern - Microsoft Azure**.

Designed and developed a microservice-based benchmarking tool to compare MS Service Fabric's Reliable Collection with MongoDB and Cassandra.

May'14 - Aug'14 **Intern - Huawei Technologies**.

Designed and simulated a Vehicular Ad-Hoc Network based lightweight "emergency message" broadcasting protocol that uses strategically chosen repeaters to ensures faster yet reliable emergency message propagation while also minimizes Broadcast Storm.

Mar'11 - Jul'13 **Full Time Software Eng. - Samsung Research Institute Bangladesh**.

- Implemented and optimized Image Filters for power and memory-constrained devices (e.g., Samsung nx300 camera).
- Added new image filters for"Samsung iStudio", Samsung's image editing software.

Technical Skills

Language: Java, C, C++, C#, Python, Scala

Software and Tools: AWS Stacks: DynamoDB, Lambda, S3, SageMaker, EC2, ECS, SNS, SQS, EventBridge etc.

Hardware: ESP8266/NodeMCU, RaspberryPi, ATmega32, Arduino.

Education

2013 - 2020 **Ph.D. in Computer Science**, *University of Illinois at Urbana–Champaign*.
Research Area: Distributed Systems.

2006 - 2011 **B.Sc. in Computer Science and Engineering**, *Bangladesh University of Engineering and Technology*.

Teaching Experiences

Fall'18,19 **CS425: Distributed Systems**, *Teaching Assistant - UIUC + Coursera*.

Spring'18 **CS525: Advanced Distributed Systems**, *Teaching Assistant - UIUC*.

Fall'13 **CS225: Data Structures**, *Teaching Assistant - UIUC*.

Publications

2021 **Shegufta Bakht Ahsan**, Rui Yang, Shadi A. Noghabi, Indranil Gupta. **Home, SafeHome: Smart Home Reliability with Visibility and Atomicity**. EuroSys'21

2020 **Shegufta Bakht Ahsan**, Indranil Gupta. **A New Fully-Distributed Arbitration-Based Membership Protocol**. Infocom'20

2019 **Shegufta Bakht Ahsan**, Rui Yang, Shadi A. Noghabi, Indranil Gupta. **Home, SafeHome: Ensuring a Safe and Reliable Home Using the Edge.** Proc. 2nd Usenix Workshop on Hot Topics in Edge Computing (HotEdge).

2018 Gopal Kakivaya, Lu Xun, Richard Hasha, **Shegufta Bakht Ahsan**, ... and Indranil Gupta. **Service Fabric: A Distributed Platform for Building Microservices in the Cloud. EuroSys'18** (in collaboration with Microsoft).

2016 **Shegufta Bakht Ahsan** and Indranil Gupta. **The CAT Theorem and Performance of New Transactional Distributed Systems.** Proc. ACM PODC Workshop on Distributed Cloud Computing (**DCC'16**).

2015 **Shegufta Bakht Ahsan** and Nitin Vaidya. **O-ACK: An Adaptive Wireless MAC Protocol Exploiting Opportunistic Token-Passing and Ack Piggybacking.** Conference on Local Computer Networks (**LCN'15**).

2014 **Shegufta Bakht Ahsan** and Nitin Vaidya. **Overheard ACK With Token Passing: An Optimization to 802.11 MAC Protocol.** The 6^{th} annual **ACM S3 Workshop** (held in conjunction with ACM MobiCom 2014).

Patents

2015 **Shegufta Bakht Ahsan**, Syeda Persia Aziz, A.S.M. Hossain Bari. **Method and apparatus for performing image-based searches**.

2015 A.S.M Hossain Bari, Sohel Ahmed, **Shegufta Bakht Ahsan**, ..., Syeda Persia Aziz. **Electronic device and method for providing information thereof**.