

# MD MAHBUB ALAM

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## RESEARCH INTERESTS

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Network Security, Machine Learning, Software Verification and Validation,

## EDUCATION

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| <b>Syracuse University</b><br>Ph.D in Computer/Information Science and Engineering   | August 2023 - Present<br>Syracuse, NY    |
| <b>Bangladesh University of Engineering and Technology (BUET)</b><br>Bachelor of Science in Computer Science and Engineering <i>CGPA: 3.57 (out of 4.00)</i> | Feb 2013 - Sep 2017<br>Dhaka, Bangladesh |

## WORK EXPERIENCE

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| <b>Syracuse University</b><br>Graduate Research Assistant | August 2023 - Present<br>Syracuse, NY |
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- Designed and implemented natural language to IoT policy language translator using LLM.
- Implemented IoT policy language validator using grammar parser
- Created an input generator using Z3 Theorem Prover to generate PKCS#1-v1.5 standard inputs.

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| <b>Intuitive Web Solutions LLC (BriteCore)</b><br>Senior Site Reliability Engineer (remote) | Redwood City, CA<br>March 2022 - July 2023 |
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- Improved monitoring of application performance and failures. Automated detection and healing of system failures.
- Diagnosed, investigated, and resolved system incidents, and performed post-incident reviews.
- Investigated security vulnerabilities and implemented security best practices across cloud infrastructures.
- Implemented monitoring and optimization of resource allocation in batch processing, which reduced infrastructure costs by 10%.

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| Senior Cloud Engineer(remote) | Oct 2021 - Feb 2022 |
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- Modularized cloud infrastructure as code using AWS CDK and Cloudformation.
- Developed deployment portal to manage applications and cloud infrastructures in 100+ AWS accounts.
- Automated upgrading 100+ production AWS database clusters ensuring minimal downtime.

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| Cloud Engineer (remote) | Aug 2019 - Sep 2021 |
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- Configured multi-master shared ElasticSearch cluster and exposed this service to multiple AWS accounts securely through AWS Private Link.
- Developed and improved CI/CD release and deployment pipelines used by 40+ products.
- Migrated legacy application from EC2 instance to Elastic Container Service.

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| <b>Field Information Solutions Ltd</b><br>Software Engineer | Dhaka, Bangladesh<br>May 2018 - Jul 2019 |
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- Developed API endpoints to support both web application and mobile application for last-mile sales distribution product.
- Revised and modularized old codebase to increase the code re-usability in new projects.

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| <b>Reve Systems</b><br>Junior Software Engineer | Dhaka, Bangladesh<br>Oct 2017 - Apr 2018 |
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- Developed source code generator using Java and Apache Velocity template engine, which ensured coherent structure and style of the codebases and enhanced development speed.
- Worked on high-performant SMS server application utilizing SMPP protocol.

## UNDERGRADUATE THESIS

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### Solving Sudoku as a Constraint Satisfaction Problem and Analyzing Effects of Constraint Ordering

The problem of solving the Sudoku puzzle is an NP-Complete problem. We formulated it as a Constraint Satisfaction Problem and solved using constraint programming. In this thesis, we introduced constraint ordering based on different criteria to determine the effects of constraint ordering. Our experiment result shows that ordering the constraints based on the number of clues gives better resolution time than unordered constraints.

**Supervised by** Abu Wasif, Assistant Professor, Department of CSE, BUET, wasif@cse.buet.ac.bd

## ACADEMIC PROJECTS

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**Adversarial Search-based Reversi Game.** Used Java Swing to build the game interface and alpha-beta pruning algorithm to find the computer's next move.

**4-bit Computer System.** Designed and implemented a 4-bit Computer System based on Simple As Possible (SAP) architecture with my team. The computer system could run 28 assembly instructions.

**University Residence Hall Management System.** A desktop application that helps the university hall office to maintain interactions with students. Used Java Swing for the UI and MySQL database for storing information.

**Online Judge** to host programming contest. Contestants could participate and submit solutions that were evaluated automatically by the server. The contest admin could configure the contest with a problem set and expected solutions. Implemented server-client communication using Java Socket Programming.

**Park Your Car** puzzle game. Built this game using C language, where the player's goal is to park his car at an available spot by moving other cars forward or backward.

**Image Scanning Robot.** Designed and implemented a robot that could scan a ground image and send it to another robot via Bluetooth communication.

## TECHNICAL SKILLS

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| <b>Programming Languages</b>   | Python, JavaScript, C, C++, Java  |
| <b>Database</b>                | MySQL, PostgreSQL, DynamoDB, Oracle   |
| <b>Framework</b>               | Django, Flask, VueJS  |
| <b>Container Orchestration</b> | Docker, Kubernetes, Elastic Container Service                                 |
| <b>Cloud</b>                   | Amazon Web Services (AWS)   |
| <b>Others</b>                  | Linux administration, Terraform, SaltStack, Git, Bash Scripting, AFL, Vagrant |

## LICENSES & CERTIFICATIONS

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| <b>CKA: Certified Kubernetes Administrator</b><br><i>Issued by</i> The Linux Foundation                                    | Aug 2022 - Aug 2025<br>See Credential |
| <b>LFCS: Linux Foundation Certified Systems Administrator</b><br><i>Issued by</i> The Linux Foundation                     | Jun 2022 - Jun 2025<br>See Credential |
| <b>AWS Certified Solutions Architect - Professional</b><br><i>Issued by</i> Amazon Web Services Training and Certification | Mar 2022 - Mar 2025<br>See Credential |
| <b>AWS Certified DevOps Engineer - Professional</b><br><i>Issued by</i> Amazon Web Services Training and Certification     | Oct 2021 - Oct 2024<br>See Credential |

## AWARDS

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**2nd Runner-up in Software Project Show.** My team was awarded the 2nd runner-up position at the **2nd International Conference on Networking Systems and Security, 2016** for **University Residence Hall Management System** project in the software project show section.