

# MD RAYHANUL ISLAM

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## RESEARCH INTEREST

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Security and Privacy, Machine Learning, Deep Learning, Formal Verification, and Cyber-Physical Systems.

## EDUCATION

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**PhD Student**, Iowa State University Fall 2021 - Current  
cGPA: 3.80 (till now), and Relevant Coursework: Machine Learning, Program Analysis, Artificial Intelligence, Algorithm Analysis and Design, Theory of Computation, Formal Methods, Natural Language Processing, Motion Strategy and its Application.

**MS in Computer Science**, Iowa State University Spring 2024 (Expecting)  
cGPA: 3.80 (till now).

**Master of Science in Software Engineering**, University of Dhaka  
cGPA: 3.96.

**Bachelor of Science in Software Engineering**, University of Dhaka  
cGPA: 3.86.

## EXPERIENCE

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**Graduate Research Assistant** May 2022 - Now  
Autonomous System Lab, Department of Computer Science, Iowa State University Ames, IA

Project Title: Sharing the World with Autonomous Systems: What Goes Wrong and How to Fix It (NSF Project)

- To formally verify the properties of the autonomous system using Formal Verification techniques.
- To develop a framework to quantify the safety and inconsistencies in the overall system when autonomous vehicles share the road with other vehicles and pedestrians.

**Graduate Teaching Assistant** August 2021 - May 2022  
Department of Computer Science, Iowa State University Ames, IA

- Object Oriented Programming, Fall 2021
  - Conducting Lab classes
  - Grading and holding office hours
- Principles of Programming Languages, Spring 2022
  - Conducting recitation
  - Preparing homework and final exam questions
  - Grading and holding office hours
- Artificial Intelligence, Spring 2024
  - Grading and holding office hours
  - Answering questions on Piazza

**Lecturer** Sep 2017 - Aug 2021  
Institute of Leather Engineering & Technology, University of Dhaka Dhaka, Bangladesh

**Software Engineer** May 2015 - Sep 2017  
Kaz Software Ltd. Dhaka, Bangladesh

- Worked on the back-end and front-end of multiple projects
- Used languages and frameworks: C#, Java, ASP.NET, JavaScript, Angular Js, Knockout Js, Ext Js, etc.

## Internship

Kaz Software Ltd.

Jan 2013 - Jul 2013

Dhaka, Bangladesh

## PUBLICATIONS

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- Dipongkor, Atish Kumar, Rayhanul Islam, Md Shafiuzzaman, Md Asif Nashiry, Syed Md Galib, and Khaza Moinuddin Mazumder. "AcPgChecker: Detection of Plagiarism among Academic and Scientific Writings." In 2021 Joint 10th International Conference on Informatics, Electronics & Vision (ICIEV) and 2021 5th International Conference on Imaging, Vision & Pattern Recognition (icIVPR), pp. 1-6. IEEE, 2021.
- Dipongkor, Atish Kumar, Iftekhar Ahmed, Rayhanul Islam, Nadia Nahar, Abdus Satter, and Md Saeed Siddik. "ABMMRS Eradicator: Improving Accuracy in Recommending Move Methods for Web-based MVC Projects and Libraries Using Method's External Dependencies." International Journal of Software Engineering and Knowledge Engineering 30, no. 09 (2020): 1289-1307.
- Dipongkor, Atish Kumar, Rayhanul Islam, Nadia Nahar, Iftekhar Ahmed, Kishan Kumar Ganguly, S. M. Raian, and Abdus Satter. "Reduction of Multiple Move Method Suggestions Using Total Call-Frequencies of Distinct Entities." International Journal of Information Engineering & Electronic Business 12, no. 4 (2020).
- Islam, Rayhanul, Abdus Satter, Atish Kumar Dipongkor, Md Saeed Siddik, and Kazi Sakib. "A Novel Approach for Converting N-Dimensional Dataset into Two Dimensions to Improve Accuracy in Software Defect Prediction." J. Softw. 15, no. 6 (2020): 147-162.
- Ganguly, Kishan Kumar, Md Saeed Siddik, Rayhanul Islam, and Kazi Sakib. "An environment aware learning-based self-adaptation technique with reusable components." International Journal of Modern Education and Computer Science 11, no. 6 (2019): 53.
- Islam, Rayhanul, and Kazi Sakib. "A package-based clustering approach to enhance the accuracy and performance of software defect prediction." International Journal of Software Engineering, Technology and Applications 2, no. 1 (2017): 1-21.
- Islam, Rayhanul, and Kazi Sakib. "A Package Based Clustering for enhancing software defect prediction accuracy." In 2014 17th International Conference on Computer and Information Technology (ICCIT), pp. 81-86. IEEE, 2014.
- Rahman, Rayhanur, Nadia Nahar, Rayhanul Islam, and Kazi Sakib. "A peer to peer resource discovery scheme for provisioning in cloud using multi attribute range query." In 2014 International Conference on Informatics, Electronics & Vision (ICIEV), pp. 1-5. IEEE, 2014.

## PROJECTS

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### Policy Evaluation on Uncertain Environment

Fall 2023

Project for COM S 676X: Advanced Topics in Autonomous Systems and Robotics

- This project aims to evaluate a policy through parameter synthesis in an uncertain environment where the system is modeled as an uncertain Markov Decision Process.

### Optimum Motion Planning using $PRM^*$ and $RRT^*$

Spring 2023

Project for COM S 576: Motion Planning for Robotics and Autonomous Systems

- This project aims to find the optimal feasible path using existing algorithms and compares existing algorithms.

### Software Vulnerability Detection

Fall 2022

Project for COM S 513 - Program Analysis

- It focused on enhancing software vulnerability detection by using program slicing and transformer-based models
- It slices a program into multiple parts so that it does not discard a program part with a vulnerability

### **Predicting Bank Loan Defaults**

**Fall 2022**

Project for COM S 572 - Artificial Intelligence

### **Predicting Loan Acceptance**

**Spring 2022**

Project for COM S 573 - Machine Learning

### **Predicting Employee Attrition**

**Fall 2021**

Project for COM S 574 - Introduction to Machine Learning

## **SKILLS**

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|                                     |   |
|-------------------------------------|---|
| <b>Programming Skills and Tools</b> | Python, R, Java, C, C++, and C#, SQL, VS Code, Jupyter Notebook |
| <b>Machine Learning</b>             | Numpy, SciKit Learn, Pandas, Seaborn, SciPy, and Pytorch        |
| <b>Model Checking</b>               | Prism, Storm, NuSMV and Spin                                    |
| <b>Robot Operating System</b>       | ROS   |
| <b>Vehicle Simulator</b>            | CARLA   |
| <b>Languages</b>                    | English and Bengali (native)                                    |

## **REFERENCES**

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### **Tichakorn (Nok) Wongpiromsarn**

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Department of Computer Science  
Iowa State University, Ames, IA  
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### **Samik Basu**

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Department of Computer Science  
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