Saaduddin Mahmud

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Education

University of Massachusetts Amherst — MA, USA
First year CS Ph.D. Student — *August 2021 – Present*

University of Dhaka — Dhaka, Bangladesh
B.Sc. in Computer Science and Engineering (CGPA: 3.86/4.00) — *January 2016 – December 2019*

Experience

Research Assistant — August 2021 – Present
Resource-Bounded Reasoning Lab, CICS, University of Massachusetts Amherst. — *MA, USA*

- AI Safety
- Explainable AI
- Autonomous Vehicle

Lecturer — January 2021 – July 2021
Dept. of CSE, Ahsanullah University of Science and Technology. — *Dhaka, Bangladesh*

- Mathematics for Computer Science
- Compiler Design

Full-time Research Assistant — February 2020 – June 2021
Cognitive Agents & Interaction Lab (CAIL), CSE, University of Dhaka — *Dhaka, Bangladesh*

- Multi-Agent Reinforcement Learning using Graph-Neural architecture for solving combinatorial games.
- Writing Grants and Presentations.

Undergraduate Research Assistant — September 2018 – December 2019
Cognitive Agents & Interaction Lab (CAIL), CSE, University of Dhaka — *Dhaka, Bangladesh*

- Advisor: Dr. Md. Mosaddek Khan.
- Decentralized Multi-Agent Coordination using Distributed Constraint Reasoning.

Current Research Projects

1. **Saaduddin Mahmud**, Sandhya Saisubramanian, and Shlomo Zilberstein. Reducing Negative Side Effects in Autonomous Systems. **Working Project, 2021**.

2. **Saaduddin Mahmud**, and Shlomo Zilberstein. Explanation Generation for Autonomous Vehicle. **Working Project, 2021**.

3. Rafid Amir Mahmud, Fahim Faisal, **Saaduddin Mahmud**, and Md. Mosaddek Khan. A Simulation Based Online Planning Algorithm for Multi-Agent Cooperative Environments. **Working Paper, Part of ICT Innovation Grant AI4SG Project, 2020**. **Working Paper, 2021**.

4. **Saaduddin Mahmud**, Md. Mosaddek Khan, and Nicholas R. Jennings. On Population-Based Algorithms for Distributed Constraint Optimization Problems. **Under Review, 2021**.

5. K. M. Merajul Arefin, Mashrur Rashik, **Saaduddin Mahmud**, and Md. Mosaddek Khan. An Artificial Bee Colony Based Algorithm for Continuous DCOPs. **Under Review, 2021**.

[1] Visit for more up to date information.

Publications

1. **Saaduddin Mahmud**, Md. Mosaddek Khan, Moumita Choudhury, Long Tran-Thanh, and Nicholas R. Jennings. Learning Optimal Temperature Region for Solving Mixed Integer Functional DCOPs. In Proceedings of the 29th International Joint Conference on Artificial Intelligence **(IJCAI), 2020**.

2. **Saaduddin Mahmud**, Moumita Choudhury, Md. Mosaddek Khan, Long Tran-Thanh, and Nicholas R. Jennings. AED: An Anytime Evolutionary DCOP Algorithm. In Proceedings of the 19th International Conference on Autonomous Agents and Multi-Agent Systems **(AAMAS), 2020.**

3. Moumita Choudhury, **Saaduddin Mahmud**, and Md. Mosaddek Khan. A Particle Swarm Based Algorithm for Functional Distributed Constraint Optimization Problems. In Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence **(AAAI), 2020**.

4. **Saaduddin Mahmud** and Moumita Choudhury (Equal Contribution). Applying Population-Based Algorithms to Solve Large (F)DCOPs. **Thesis, Department of Computer Science and Engineering, University Of Dhaka, 2020.**

Honors & Awards

H.S.C. Scholarship of the Bangladesh Government
Awarded for outstanding performance in High-School.

- Yearly stipend and full tuition waiver for the undergrad.

ACM International Collegiate Programming Contest (ICPC), Dhaka Regional - 2017
Represented University of Dhaka in the biggest national-level programming contest.

Skills

Languages: Python, Julia, C/C++, Ruby, Java, JavaScript.
Frameworks: Node.js, Flask.
Database: MySQL, Oracle, MongoDB
Libraries Pytorch, Fast.ai, NetworkX.
Hardware Level: MIPS, NASM Assembler, Nvidia CUDA.
OS: Ubuntu, Windows, Raspbian.

Software Projects

AL.GO | *A JAVA Application For Visualization of Classical Algorithms.* 2017

- Step by step visualizer for sorting and graph algorithms.
- Contains codes, problem links on these algorithms to help students learn faster.

MuSyc | *An Android Application For Music Synchronization Across Mobile Devices.* 2017

- Music synchronization across different mobile devices using shared music files.
- Functions as a social network where you can share music and become friends with other users.

EasyML | *A Python Web Application For Visual Machine Learning.* 2018

- High-dimensional data visualization using different Dimensionality Reduction Algorithms with intuitive UI.
- Visual Performance Comparison and hyperparameter optimization for different machine learning algorithms.

Reference

Professor Shlomo Zilberstein | *Professor, CICS,University of Massachusetts Amherst, Amherst, MA, USA*

- Email: shlomo@cs.umass.edu
- Personal Website: https://groups.cs.umass.edu/shlomo/

Dr. Md. Mosaddek Khan | *Assistant Professor, Department of Computer Science & Engineering, University of Dhaka*

- Email: mosaddek@du.ac.bd
- Personal Website: mmkhansajeeb.com