# Saaduddin Mahmud

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## Education

**B.Sc. in Computer Science and Engineering** *Dhaka, Bangladesh*

Department of Computer Science and Engineering, University of Dhaka *January, 2016 - January, 2020*

- **CGPA:** 3.86/4.00

## Research Experiences

**Cognitive Agents & Interaction Lab, University of Dhaka**

Full-time Research Assistant *February, 2020 - Present*

- Applying Reinforcement Learning for Multi-Agent Coordination.
- Applying Reinforcement Learning and Game-Theory to improve security resource allocation.
- Mentoring undergraduate students associated with the lab on final year research project.

**Cognitive Agents & Interaction Lab, University of Dhaka**

Undergraduate Research Assistant *September, 2018 - January, 2020*

- Decentralized Multi-Agent Coordination.

## Research Interests

1. Multi-agent Systems (Coordination and Planning, Multi-agent RL, Game Theory).
2. Interaction Between Human and Robot/AI.
3. AI for Social Impact and Computational Sustainability (Game Theory and RL for social good).
4. Decentralized Optimization and Inference (Constraint Network, Factor Graphs, PGMs).

## Current Research Projects

1. Saaduddin Mahmud, Md. Mosaddek Khan, and Nicholas R. Jennings. *On Population-Based Algorithms for Distributed Constraint Optimization Problems*. Under Review, 2020
2. Using Reinforcement Learning for Multi-Agent Coordination and Allocation of Security Resources. On going research project as a part of the ICT Innovation Grant, 2020.

## 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*. Department of Computer Science and Engineering, University Of Dhaka, 2020

## Honors & Awards

2016 **H.S.C. Scholarship of The Bangladesh Government,** A scholarship awarded to undergraduate students for their outstanding performance in high school.

2016 **1st in junior deviation,** Battle of Brains - 2016 (Competitive Programming)

2017 **1st Runner up,** Battle of Brains - 2017 (Competitive Programming)

2017 **Participated,** ACM International Collegiate Programming Contest, Dhaka Regional

## Skills

**Languages** Python, Julia, C/C++, Ruby, Java

**Web** JavaScript, Flask

**Databases** MySQL, Oracle, MongoDB

**Library** Pytorch, Fast.ai

**Hardware Level:** MIPS, NASM Assembler, Nvdia CUDA

## Software Projects

### AL.GO (See project)

A project written in Java to visualize well known algorithms. *2017*

- Step by step algorithm visualizer.
- Contains codes, problem links on specific topics to help students learn faster.

### MuSyc (See project)

An android application for music synchronization across mobile devices. *2017*

- Music synchronization across different mobiles.
- Social-network for sharing music.

### EasyML (See project)

A web application written in Python for automated data visualization and classification. *2018*

- Automated data visualization and classification.
- Fast hyper-parameter optimization for different classifiers.

## Reference

### Dr. Md. Mosaddek Khan

- Assistant Professor, Department of Computer Science and Engineering
  University of Dhaka
  http://mmkhansajeeb.com
  mosaddek@du.ac.bd