

RAHEEB HASSAN

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RESEARCH INTERESTS

Computer Vision, Reinforcement Learning, Multi-agent systems

EDUCATION

2018 - 2023 **University of Dhaka** *BSc. (Hons)*
Department of Computer Science and Engineering
CGPA: 3.75 (2nd highest among 54 students)
Thesis Topic: Safe Multi-Agent Reinforcement Learning
Supervisor: Dr. Md. Mosaddek Khan

RESEARCH EXPERIENCE

2021 - **Research Assistant** *Cognitive Agents and Interaction Lab (CAIL), University of Dhaka*

- Studied and benchmarked several **reinforcement learning** algorithms
- Researched **safety** in reinforcement learning and **multi-agent systems**
- Developed a novel decentralized safe multi-agent reinforcement learning algorithm
- Worked with applying **graph neural networks** and reinforcement learning for solving combinatorial optimization problems

PROFESSIONAL EXPERIENCE

2/2023 - **Machine Learning Engineer** *Therap (BD) LTD, Dhaka, Bangladesh*
(Therap Services LLC, Connecticut, USA)

- Worked with **computer vision, face recognition, multi-object tracking, activity recognition**
- Designed a system integrating real-time monitoring data from cameras and sensors to generate long-term statistical models of individual behavior.
- Optimized ML pipelines to work on resource constrained environments using **NVIDIA Deepstream**
- Worked on scaling distributed ML video processing systems in the cloud (**AWS, Oracle Cloud**)

2020 - 2021 **Full Stack Developer** *CranTech LLC, New York, USA*
Remote

- Worked on several web development projects like **Shoshikkha, Amplify**, etc.
- Worked with **ReactJS** (frontend), **ExpressJS** (backend) and **React Native** (Mobile)

PUBLICATIONS

Published **DePAint: A Decentralized Safe Multi-Agent Reinforcement Learning Algorithm considering Peak and Average Constraints** *Springer Applied Intelligence Journal*
Authors: **Raheeb Hassan**, K.M. Shadman Wadith, Md. Mamun or Rashid, Md. Mosaddek Khan
Keywords: *Decentralized Learning, Reinforcement Learning (RL), Mutli Agent RL, Safe RL, Peak Constraint, Average Constraint*
DOI: 10.1007/s10489-024-05433-x
Preprint: <https://arxiv.org/abs/2310.14348>

Under Review **A Graph Neural Network-Based QUBO-Formulated Hamiltonian-Inspired Loss Function for Combinatorial Optimization using Reinforcement Learning**
Author: Redwan Ahmed Rizvee, **Raheeb Hassan**, Md. Mosaddek Khan
Keywords: *Hamiltonian Function, Deep Reinforcement Learning, Graph Neural Network, Monte Carlo Tree Search*
Preprint: <https://arxiv.org/abs/2311.16277>

AWARDS AND ACHIEVEMENTS

Awards
Best Undergraduate Final Project Award 2021 (Held on Jan 2023)
Department of Computer Science and Engineering, University of Dhaka
Scholarship Recipient for Academic Excellence in Undergraduate Examinations 2021
University of Dhaka

Competitions	Hackathons
	• Code Samurai: Inter-University Hackathon 2022 (Champion)
	Programming Competitions
	• International Collegiate Programming Contest Asia Dhaka Regional 2021 (16th place) • MIST Inter University Programming Contest 2019 (20th place) • SUB Inter University Programming Contest 2019 (28th place)
Miscellaneous	Cybersecurity Competitions
	• SUST Technovent 2023 Capture the Flag (11th place)
	Online Judge
	LightOJ (90+ problems), Codeforces (expert) (top 20%) , Codechef (blue)

PROJECTS

Python	kamlabot AI-powered helper chatbot for fetching various useful info (like class routine, syllabus, etc.) Uses NLP to parse message intent and fetch data from Firebase Database	github.com/hoenchioma/kamlabot
Unity, C#, Python	Trojan Capture The Flag A capture-the-flag game with AI-powered agents who can deceive you Trained agents using multi agent reinforcement learning (MA-POCA)	
Android, Java, C/C++	hotkey A cross-platform solution for controlling your PC from a mobile device	github.com/hoenchioma/hotkey
Python	vlawyer An unofficial vjudge statistics API	github.com/hoenchioma/vlawyer
SFML, OpenGL, C/C++	Depths of CSEDU Top-down horror/adventure RPG	github.com/hoenchioma/Depths-of-CSEDU
ReactJS, NodeJS, Strapi	Corona Factcheck A website for fact-checking Corona-related information	github.com/Viper4717/corona-factcheck-frontend

STANDARDIZED TESTS

GRE	Quantitative Reasoning:	161	TOEFL	Total:	113
	Verbal Reasoning:	162		Reading:	30
	Analytical Writing:	4.0		Listening:	29
				Speaking:	27
				Writing:	27

SKILLS

Languages:	Python, C++, C, Java, Javascript, Typescript, C# (Unity3D), Dart (Flutter)
Machine Learning:	PyTorch, TorchVision, NVIDIA DeepStream, Scikit-Learn, Optuna.
Data Science:	Pandas, Numpy, Sympy, Matplotlib, Seaborn, Scrapy.
Web:	ReactJS, NodeJS, FastAPI (Python).
Miscellaneous:	Git, Docker, Linux (Debian, Arch), AWS Cloud, Oracle Cloud.