

RAHEEB HASSAN

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RESEARCH INTERESTS

Computer Vision, Reinforcement Learning and Multi-agent systems

EDUCATION

2018 - 2023 **University of Dhaka** *BSc. (Hons) in Computer Science and Engineering*
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 (Thesis) Award**
Department of Computer Science and Engineering, University of Dhaka
Scholarship Recipient for Academic Excellence in Undergraduate Examinations
University of Dhaka

Competitions	Hackathons
	• Code Samurai: Inter-University Hackathon 2022 (Champion)
	Programming Competitions
	<ul style="list-style-type: none"> • 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.