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**, **Amplfiy**, 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*

Accepted for Publication	**Reinforcement Learning Based Formulations with Hamiltonian-Inspired Loss Functions for Combinatorial Optimization over Graphs** *IEEE Access Journal*

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
	• 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**)
	Cybersecurity Competitions
	• SUST Technovent 2023 Capture the Flag (**11th place**)
Miscellaneous	**Online Judge**
	LightOJ (90+ problems), Codeforces (expert) (top 20%) , Codechef (blue)

PROJECTS

Python	**kamlabot**	*github.com/hoenchioma/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	
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**	*github.com/hoenchioma/hotkey*
	A cross-platform solution for controlling your PC from a mobile device	
Python	**vlawyer**	*github.com/hoenchioma/vlawyer*
	An unofficial vjudge statistics API	
SFML, OpenGL, C/C++	**Depths of CSEDU**	*github.com/hoenchioma/Depths-of-CSEDU*
	Top-down horror/adventure RPG	
ReactJS, NodeJS, Strapi	**Corona Factcheck**	*github.com/Viper4717/corona-factcheck-frontend*
	A website for fact-checking Corona-related information	

STANDARDIZED TESTS

GRE			**TOEFL**		
	Quantitative Reasoning:	161		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.