RAHAT SANTOSH

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Education

M.Sc in Artificial Intelligence 2023 — 2024
The University of Edinburgh (Merit)
Research Review: Advancing Multi-Agent Reinforcement Learning through Hierarchical Paradigms
Thesis: Integrating Agent Modelling in Multi-Agent Reinforcement Learning

B. Tech in Computer Science and Engineering (Minor: Big Data) 2018 — 2022
Manipal Institute of Technology, Manipal (CGPA: 9.06/10)
Thesis: Single and Multi-Agent Reinforcement Learning for Strategy Games

Technical Skills

TensorFlow/Keras; PyTorch/FastAI; Pinnochio; Scikit-learn; Apache Spark; Hadoop; Kafka; Alteryx; Google Data Studio; Tableau; OCI / Oracle Fusion; Jira; Tensorflow.js / TensorFlow Lite; Django; Leaflet.js; GDAL (Python Bindings); OpenAI Gym; PettingZoo; Ray; PyTorch Lightning; Qiskit

Languages: Python / C / C++ / R / Terraform / SQL

Experience

Associate Software Developer: Oracle India Private Limited August 2022 — August 2023
Oracle

- Automated OCI tenancy management processes using Terraform and OCI SDK, enhancing security compliance and reducing manual efforts by 40%.
- Streamlined virtual network vulnerability scans and port security using OCI SDK, mitigating security risks efficiently across 11 global teams and cloud tenancies.

Research Intern: Centre for Artificial Intelligence and Robotics January 2022 — July 2022
Defence Research and Development Organization
CAIR DRDO

- Optimised RL models (e.g., AlphaZero, mini-AlphaStar) for strategy games tailored for war games and command-and-control applications.
- Developed hierarchical multi-agent RL networks, integrating centralised and decentralised policies to enhance computational efficiency.

Intern: Samsung Research Institute January 2022 — August 2022
Samsung Research Institute Bangalore

- Developed an on-device utility for ONNX model manipulation, packaged as an Android native shared library, enabling seamless edge-device integration.
- Recognised with an Internal **Certificate of Excellence** for advancing edge-device flexibility in C++ and ONNX Runtime.

Intern: North Eastern Space Applications Centre April 2021 — July 2021
Indian Space Research Organization
NESAC

- Developed a novel distributed geospatial platform, improving FCC and NDVI operations' processing times by up to 25%.
- Migrated to COG formats, enhancing data access speeds and reducing latency by 20% for compressed datasets.
- Streamlined analytics with a custom compiler engine and ensured compliance with OGC standards.

Computer Vision Intern: KoiReader Technologies January 2021 — April 2021
KoiReader

- Applied deep learning and image processing techniques to develop a system for font type segmentation in logistics documents, leveraging tools like TensorFlow and OpenCV.

Data Science Fellow: Fellowship.ai September 2020 — December 2020
Fellowship.ai

- Built a deep learning application for vegetable "doneness" classification using Cycle-GAN and self-supervised learning; curated datasets via web scraping.
- Worked on project detecting and tagging spinal implants from X-rays and delivering an intuitive data dashboard tailored for both technical and non-technical stakeholders.

Major Projects

Agent Modelling in MARL Algorithms (PyTorch, LBF, PettingZoo, OpenAI Gym, SMAClite)
Extended the ePyMARL repository to enable opponent or agent modelling in various MARL algorithms. Part of MSc Dissertation under the Autonomous Agents Research Group.

Quantum Circuit Optimization (Qiskit, PyTorch, PyTorch Lightning, Ray RLLib)
Applied Reinforcement Learning to optimise quantum gates in circuits, reducing depth and hence, enhancing accuracy.

Autoportrait Segmentation (PyTorch, PyTorch Hub)
Automatic portrait segmentation model (image matting).

Map Compiler (Django, PostgreSQL, GDAL, QGIS)
Developed a distributed geospatial data analysis platform with custom analytics using Django, PostgreSQL, and Jupyter Notebooks. Undertaken at NESAC.

Infrastructure as Code (IaaC) for Security Vulnerabilities (Python, Ansible, Terraform, OCI)
Created an IaaC solution to update cloud instances and prevent blacklisted ports across multiple tenancies. Undertaken at Oracle.

ONNX Device Modification on Edge Devices (C++, ONNX, Protobuf)
Developed a utility for modifying and editing ONNX models on edge devices, packaged as an Android-shared library. Conducted at Samsung Research Institute, India.

Key Achievements

- Selected for the **University of Edinburgh Venture Builder Incubator** cohort 2024, working on the Quantum Hardware Optimization project.
- Selected for the prestigious **Summer Startup Accelerator** under **Edinburgh Innovations**, working on the Quantum Hardware Optimization project, and successfully raised £3,000.
- Internal **Certificate of Excellence** while working at **Samsung R&D Institute India**.