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Sriyash Poddar

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Research Interests

Machine Learning, Reinforcement Learning, Autonomous Control, Multi-Agent Learning, Natural Language Processing

Academics

2018 - 2023 (Expected) | *M.Tech + B.Tech* in Computer Science and Engineering — **GPA: 9.30**/10.0 (Ongoing)
Indian Institute of Technology, Kharagpur
Advisor: Prof. Partha Pratim Chakraborty

Research Experience

Dec'20 - Current | **Imperial College London** — Guide: Fabio Pardo
Objective: Exploring efficient architectures for solving continuous control tasks.
-Currently working on Hierarchical Reinforcement Learning using options, attention-based architecures and exploiting symmetry in large action spaces to improve sample efficiency during learning.
-Implemented and tested the use of recurrent architectures on control tasks, on-policy algorithms and POMDPs.

Aug'20 - Current | **CERN Atlas Group, Chinese University of Honk Kong** — Guide: Prof. Luis Roberto Flores Castillo
Objective: Development of Deep Learning Models for High Energy Physics, to improve the classifier sensitivity for signals in the detector and reduce the redundancy of creating classifiers for each mass point. (Code) (Code)
- Used anomaly detection to search for exotic particles in atomic collisions; achieving a ROC score of 0.85.
- Built supervised background and signal classifiers for the collision data; achieving 95% accuracy.

May'19 - Current | **Kharagpur RoboSoccer Students Group** — Guide: Prof. Alok Kanti Deb
Objective: Leading the humanoid team of an undergraduate research group for the design and implementation of autonomous humanoid agents, capable of playing 11v11 soccer. (Code) (KRSSG Team Description Paper)
- Building an environment using PyBullet to train an end to end walk engine of a Nao-v40 bot, using reinforcement learning, imitation learning and model-based control.
- Used Covariance Matrix Adaptation Evolution Strategy to optimise the 84 parameters of an Inverse Kinematic Walk Engine; doubling the performance across tasks like walking and dribbling.
- Only undergraduate team to qualify for the 3D Simulation League at RoboCup Sydney, 2019 and Bordeaux, 2020.

Jan'20 - June 20 | **Complex Networks Research Group** — Guide: Prof. Niloy Ganguly
Objective: Working on information retrieval, sentiment analysis, and multi task learning. (Preprint)
- Building a Multi-Task Affect Classifier across categorical and continuous emotions to analyze the changing dynamics of public emotions on social media, and achieved a 20% improvement in scores across both domains.

Technical Skills

Languages | C | C++ | Python | Julia | Java | JavaScript | Go
Frameworks | PyTorch | Tensorflow | CUDA | MPI | ROS | OpenCV
Others | Flask | ReactJS | SQLAlchemy | Docker | Git | LaTeX

Projects

- **The Julia Language**
  - Contributed to the FluxML backend, in the packages NNLib.jl, Gym.jl, Flux.jl, adding various loss functions and optimizers.
  - Implemented RL algorithms and environments such as MuJoCo-Ant using Lyceum.jl, and the package Gridworlds.jl.
- **Athena**
  - Built a course management system as a part of the Software Engineering Project, using ReactJS and Flask. (Code)
  - Added features like recommend courses, build schedules and forums and notice boards, using SocketIO and ElasticSearch
- **IBM Green Hack**
  - Developed an LSTM based approach to model irregularities in meteorological patterns to predict the highest yield crop.
  - Was awarded first position at the overnight hackathon based on tackling climate change. (Blog)

Coursework

(T)heory and (L)aboratory

Algorithms(T/L), Formal Language and Automata Theory, Probability and Statistics, Linear Algebra Computer Architecture (T/L) Compilers (T/L), Computer Networks(T/L), Operating Systems(T/L), Deep Learning, High Performance Parallel Computing

Achievements

- **IIT-JEE Advanced AIR 387:** In the top 0.2% amongst more than 2,00,000 students
- **IIT-JEE Mains AIR 591:** In the top 0.1% amongst more than 11,00,000 students.
- **National Olympiads:** Awarded the KVPY Fellowship by the Government of India

Extra Curricular

- **Co-ordinator, CodeClub, IIT Kharagpur:** Organised up.AI 2018, one of the largest summits in the state on AI for Social Good.
- **Mentor, IEEE ML Winter School, IIT Kharagpur:** Mentored 50+ students at a week long workshop on Machine Learning.