sriyash421
Sriyash Poddar

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sriyash421.github.io

Research Interests

AI and Machine Learning: Reinforcement Learning, Life-long Learning, Multi-Agent Learning and Robotic Manipulation

Education

2018 - 23 (Expected) | *M.Tech + B.Tech* in Computer Science and Engineering — **GPA: 9.40**/10.0 (Ongoing)
Indian Institute of Technology, Kharagpur

Publications

- Winding Through: Crowd Navigation via Topological Invariance *Under review at R-AL*
Christoforos Mavrogiannis, Krishna Balasubramanian, **Sriyash Poddar**, Anush Gandra, Siddhartha Srinivasa

- Optimal Sequential Decision Making with Changing Action Space *Adobe US Patent (filed)*
Sriyash Poddar, Tanay Anand, Pinkesh Badjatiya, Jayakumar Subramanian, Georgios Theocharous, Balaji K.

- Understanding the Role of Affect Dimensions in Detecting Emotions from Tweets: A Multi-task Approach *ACM SIGIR 2021*
Rajdeep Mukherjee, **Sriyash Poddar***, Atharva Naik*, Soham Dasgupta, Niloy Ganguly

Research Experience

Mila - Quebec Artificial Intelligence Institute — **Guide: Prof. Sarath Chandar**
Research Areas: Multi-Agent Reinforcement Learning, Curiosity based Learning — May'22 - July'22
- Worked on intrinsic motivation in multi-agent reinforcement learning to solve the problems of non-stationarity in MARL.
- Contributed and help maintain the framework: RLHive, a singular RL framework for single and multi-agent training.

Personal Robotics Lab, University of Washington — **Guide: Prof. Siddhartha Srinivasa**
Research Areas: Social Navigation, Human Robot Interaction. — April'21 - Jan'22
- Working on building uncertainty aware and topologically compliant MPC for safer and adaptive control in crowd navigation.
- Demonstrated and tested the robustness and safety of the framework in real-world experiments using the Honda PathBot.

Adobe Inc. — **Media and Data Science Research, Noida**
Research Areas: Continual Learning, Representation Learning, Topology based Learning. — May'21 - Aug'21
- Trained a lifelong learning agent to generate action representations across dynamic action spaces, such as product offers.
- Used topological regularizers for efficient performance transfer and re-learning, across the changing action spaces.

Kharagpur RoboSoccer Students Group — **Guide: Prof. Alok Kanti Deb**
Research Areas: Autonomous humanoid agents, Robosoccer, Robotics, Controls. — Apr'19 - Current
- Training an end to end walk engine of a Nao-v40 bot, using reinforcement learning and model-based control.
- Lead the only undergraduate team to qualify for the 3D Simulation League, RoboCup Sydney, 2019 and Bordeaux, 2020.

Technical Skills

Languages: C | C++ | Python | Julia | Java | JavaScript | Go
Tools: PyTorch | Tensorflow | CUDA | MPI | ROS | OpenCV | FluxML
Frameworks: Flask | ReactJS | SQLAlchemy | SocketIO | PyMS
Others: Docker | Git | LaTeX | Linux | AWS | Google Cloud

Projects

•**Scalable Multi-Agent Reinforcement Learning in Robotic Warehouses** — **Bachelor Thesis Project**
- Working on the problem of generating policies for large scale warehouse systems involving pickup and drop tasks.
- Exploring the use of a single policy over-limited agents and expanding to large-scale systems using scene-graph decomposition.

•**Accelerating Graph Algorithms**
- Implemented a CUDA framework to accelerate basic graph alogrithms such as BFS, DFS and All pairs minimum distance.
- Demonstrated scaling of the framework to large scale real-world graphs such as facebook friends, bitcoin and other commercial graph data.

•**Incompatible Control with Transformer Networks** — **Guide: Fabio Pardo**
- Used transformers for training zero shot transferable policies across robot morphologies for continuous control.
- Built an environment to generate robots with random morphologies, representing each robot design as a graph network.

•**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.

Services and Extra Curricular

- **Member, MetaKGP:** Member of a student organisation which built and maintained several apps for students at IIT Kharagpur.
- **Code-o-Soccer, IIT Kharagpur:** Organised Code-o-Soccer, a student run competition on simulated soccer playing robots.
- **Co-ordinator, CodeClub, IIT Kharagpur:** Organised up.AI 2018, one of the largest summits in the state on AI for Social Good.

Achievements

- **Joint Entrance Exam:** Rank 591 out of 1M candidates in JEE Mains and 387 out of 230k candidates in JEE Advanced
- **National Olympiads:** Awarded the KVPY Fellowship by the Government of India