Tarun Gupta

tarun018 · tarungupta.in · tarun1995gupta@gmail.com

Education

International Institute of Information Technology, Hyderabad 2014-2018
B.Tech (Hons.) and MS by Research in Computer Science and Engineering CGPA: **9.32**/10
Advisor: *Prof. Praveen Paruchuri*, Machine Learning Lab, IIIT Hyderabad **(Batch Rank: 1)**
Co-Advisor: *Prof. Akshat Kumar*, Singapore Management University

Dhirubhai Ambani Institute of Information and Communication Technology 2012-2014
B.Tech in Information and Communication Technology (Transferred to IIIT in 2014) CGPA: 8.02/10

Publications

Tarun Gupta, Akshat Kumar, and Praveen Paruchuri. *Planning and Learning For Decentralized MDPs With Event Driven Rewards.* **AAAI**. **2018, Oral**. [PDF]

Tarun Gupta, Akshat Kumar, and Praveen Paruchuri. *Planning and Learning For Decentralized MDPs With Event Driven Rewards.* **Workshop on Planning and Inference. AAAI**. **2018**. [PDF]

Achievements & Honors

- **Google India, Microsoft Research India and AAAI Student Scholarship** travel grant to attend **AAAI** 2018.
- Awarded **Deans Academic Merit list** that is awarded to **top 5% students** consistently.
- Awarded **CBSE Merit Scholarship** for AISSE secondary school exam awarded to students achieving 10/10 CGPA.
- Selected for Autonomous And Multi Agent Systems (**AAMAS**) 2016 summer school organized in Singapore.

Research Projects

Planning and Learning For Decentralized MDPs With Event Driven Rewards
Guide: Prof. Praveen Paruchuri and Prof. Akshat Kumar

- Developed and implemented novel **scalable** algorithms for solving event based Decentralized-MDPs advancing the state of the art.
- Developed a **non linear optimization** (NLP) program for event based planning model.
- Developed a scalable **probabilistic inference (Expectation Maximization)** based approach that scales much better than NLP solvers for large number of agents.
- Developed a **policy gradient** based multiagent **deep reinforcement learning** approach that scales well even for exponential state spaces.
- Tested the algorithms on a **large real-world multiagent coverage problem** modeling schedule coordination of agents in a real urban subway network where other approaches fail to scale.

Work Experience

Open Source Contributor at Google Summer of Code · · *May'17 - Aug'17*
XMPP Standards Foundation

- Implemented Mediated Information Exchange (MIX) adhering to RFC6120 for Swift, which is an open-source XMPP client for instant messaging and multi-user chat.

Open Source Contributor at Google Summer of Code · · *May'15 - Aug'15*
XMPP Standards Foundation

- Implemented various XEPs for the Extensible Messaging and Presence Protocol (XMPP) Java library (Stroke) adhering to RFC3920 guidelines adding features for Jabber ID, VCards, IDN, Multi-User Chat, Client Discovery.

Teaching Assistant, IIIT Hyderabad

Multi Agent Systems under *Prof. Praveen Paruchuri* — Monsoon'17
Optimization Methods under *Prof. Sujit Gujar* — Spring'17, Spring'18
Statistical Methods in Artificial Intelligence under *Prof. Avinash Sharma* — Monsoon'16
Artificial Intelligence under *Prof. Praveen Paruchuri* — Spring'16
Structured System Analysis and Design under *Prof. Raghu Reddy* — Monsoon'15

Research Assistant, Machine Learning Lab, IIIT Hyderabad *Aug'17 - Present*

- Working on improving scalability of multi-agent planning algorithms for applicability to real world domains through a synthesis of rigorous techniques from multiple sub-areas of artificial intelligence, machine learning and optimization methods.

Selected Major Projects

Cloud Orchestration Layer *Cloud Computing*

- Built a framework similar to Amazon EC2 console that can coordinate the provisioning of compute and storage resources by negotiating with a set of Hypervisors running across physical servers in the datacenter.

Security in Multiagent Systems by Policy Randomization *Multi Agent Systems*

- Implemented algorithms to randomize single and multi-agent MDPs by maximizing a weighted entropy function and maintaining a certain threshold of reward.

Selected Minor Projects

AI for Ultimate Tic Tac Toe *Artificial Intelligence*

- An Automated AI based Player for Ultimate Tic Toe implemented in Python using Greedy Heuristic based Alpha Beta Pruning and Depth Optimization.

Activity Recognition Using Cell Phones *Machine Learning*

- Classifying human activity recognition amongst six categories using Support Vector Machines and deep Convolutional Neural Networks (CNNs) with Long Short-Term Memory cells (LSTMs).

Database Query Engine *Database Systems*

- Implemented a SQL query parser and executor to manipulate data in csv files that can run a subset of SQL queries (select, from, where, aggregate functions, join). Also implemented the two-phase merge sort algorithm to sort large number of records.

Skills

Programming Languages: Java, Python, C++, C, MATLAB.
Libraries & Frameworks: Theano, Tensorflow, Scikit-learn, Keras.
Web Technologies: Web2py, Flask, Javascript, HTML/CSS.
Other Tools: Git, MongoDB, SQL, LATEX.

Relevant Coursework

UNDERGRADUATE
Artificial Intelligence
Cloud Computing
Computer Networks & Operating Systems
Algorithms & Data Structures
Database Systems

GRADUATE
Machine Learning
Multi Agent Systems
Optimization Methods
Advanced Computer Networks