NIKUNJ GUPTA

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OBJECTIVE	I study the paradigms in artificial intelligence where complex, goal-directed, and adaptable behaviors emerge from unsupervised interactions between groups of learning agents. I enjoy designing efficient algorithms for large-scale real-world problems. In the long run, I want to leverage insights from human intelligence to improve machine intelligence and use advances in machine intelligence to understand human intelligence better.

RESEARCH AREAS

(Single)(multi-agent)(deep) reinforcement learning, sequential decision-making under uncertainty, graph neural networks.

EDUCATION

PhD in computer science, University of Southern California	2023-Ongoing
MS in computer engineering, New York University (THESIS)	2021-2023
BTech & MTech in information technology, IIITB (THESIS)	2014-2019

EXPERIENCE

MILA QUEBEC AI, Research Intern, Prof. Samira Ebrahimi Kahou	Jan-Jul 2023
NYU COURANT, MSc Thesis, Prof. Dennis Shasha	2022-2023
NYU CDS, Research Assistant, Prof. Jacopo Cirrone	Apr-Dec 2022
NYU TANDON, Research Assistant, Prof. Quanyan Zhu	Sep-Dec 2021
UNIVERSITY OF ALBERTA, Research Assistant, Prof. Matthew Taylor	2020-2021
AGANITHA (an AI startup) India, Data Scientist	2019-2020
IIITB, MTech Thesis, Prof. GS Raghavan	2018-2019
ERICSSON RESEARCH INDIA, Research Intern, Dr. Swarup Mohalik	2018-2019
ABB RESEARCH INDIA, Research Intern, Dr. Divyasheel Sharma	Summer 2017

SELECTED PUBLICATIONS ($\alpha - \beta$)

In Submission / Ongoing

S1. CAMMARL: Conformal action modeling in multi-agent RL (PAPER)
Nikunj Gupta, Somjit Nath, Samira Ebrahimi Kahou
ICML 2024 (**under submission**)
Previously accepted in *Multi-Agent Behavior* workshop at CVPR 2023.

Journal Papers

J1. HAMMER: Multi-level coordination of RL agents via learned messaging (PAPER)
Nikunj Gupta, GS Raghavan, Swarup Mohalik, N Kumar, Matthew Taylor
Neural Computing and Applications 2023, Impact factor (2022): 6.0
Previously accepted in *Adaptive and Learning Agents* workshop at AAMAS 2021.

Conference Papers

C2. Planning multiple epidemic interventions with reinforcement learning (PAPER)
Anh Mai, **Nikunj Gupta**, Azza Abouzied, Dennis Shasha
IJCAI 2023.

C1. ML-based prediction of drug effectiveness in rheumatoid arthritis (PAPER)
Shengjia Chen, **Nikunj Gupta**, W Galbraith, Valay Shah, Jacopo Cirrone
ICBBE 2022.

Preprints

P2. On the calibration of compartmental epidemiological models (PAPER)
Nikunj Gupta, Anh Mai, Azza Abouzied, Dennis Shasha
Preprint 2023.

P1. Informationally-Mosaic Reinforcement Learning (PAPER)
Nikunj Gupta, Tao Li, Quanyan Zhu
Preprint 2022.

TEACHING	Introduction to Programming, USC	Fall 2023
	Introduction to Reinforcement Learning, IIITB	Summer 2019
	Applied Machine Learning, TCS Bangalore, Videoken, IIITB	Spring 2019
	Mathematics for Machine Learning, IIITB	Fall 2018

SERVICE	**Reviewer**, Neural Computing and Applications Journal	2023/2024
	Publicity Chair, HiPC 2024 Conference	2024
	Travel Awards Chair, HiPC 2023 Conference	2023

ACADEMIC PROJECTS (SELECTED)

- Active interactive learning (USC) (TASK)(REPORT)
- Mathematical formulation of a research project (USC) (TASK)(REPORT)
- Low-rank models for missing data imputation in EHRs (NYU) (ARXIV)(CODE)
- Optimizing ResNet while being mindful of limited resources (NYU) (ARXIV)(CODE)
- Spectral Clustering algorithms for Directed Graphs (NYU) (ARXIV)(CODE)
- Text-conditional DCGANs for text-to-image synthesis (IIITB) (REPORT)(CODE)
- Qualitative Inference with Multi-modal Interaction (IIITB) (REPORT)(CODE)

PRESENTATIONS (SELECTED)

ON THE CONFLUENCE OF MARL AND GRAPHS, USC	2024
DECISION-MAKING UNDER UNCERTAINTY VIA MARL, USC	2023
CAMMARL (accepted paper), MABe @ CVPR 2023, Mila	
SPECTRAL CLUSTERING ON DIRECTED GRAPHS, NYU	2022
LOW-RANK-MODELS FOR MISSING DATA IMPUTATIONS IN EHRS, NYU	
INFORMATIONALLY-MOSAIC REINFORCEMENT LEARNING, NYU	
HAMMER (accepted paper), ALA @ AAMAS 2021	2021
BRINGING RL TO THE REAL WORLD!, IMPRS-IS PhD Symposium 2021	
FULLY COOPERATIVE MULTI-AGENT RL: BUSINESS ANGLE, Aganitha	2019
MARL FOR WAREHOUSE LOGISTICS, Ericsson Research, RISE Conf'19	
TEXT-TO-IMAGE SYNTHESIS, AI Club, IIITB	2018
DEEP CONVOLUTIONAL GANS, IIITB	
A COMPREHENSIVE SURVEY OF MULTI-AGENT RL, IIITB	
INTRODUCTION TO REINFORCEMENT LEARNING, AI Club, IIITB	
REGION-BASED CNNS, Advanced machine perception seminar, IIITB	
REMOTE SENSING: CHENNAI FLOODS 2015, IIITB	
QUALITATIVE INFERENCE WITH MULTIMODAL INTERACTIONS, IIITB	
CGNET SWARA: AN INDIAN VOICE-BASED PORTAL, Microsoft Research India	2017
SMART POLLUTION UNDER CONTROL, Hackmania Hackathon (Winner)	2016

RELEVANT COURSES

USC	Autonomous decision-making, Advanced analysis of algorithms
NYU	Deep learning, Mathematical tools for data science, Mathematical statistics, Optimization, Probability and stochastic processes
IIITB	Foundations of big data algorithms, ML, AI, DNN, RL
Online	CS224W Machine learning with graphs (Stanford) (LINK)

AWARDS & INVOLVEMENT

Graduate scholarship (USD 12000), NYU Tandon	2021-23
Mentor for 2 interns, Intelligent Robot Learning Lab, University of Alberta	2021
Mentor for 5 students, Student Mentoring Program, IIITB	2017-18
Volunteer, CGNet Swara, Microsoft Research India (LINK)	2017
Organizer, Tug of War and Badminton in IIITB's sports fest	2016/2018
Winner (1500+ teams nation-wide), HackMania hackathon, SPUC (LINK)	Oct 2016
Winner (15 teams; 65 students), IIITB's DS hackathon, FitWit (LINK)	Feb 2016
All India Percentile: 99.33, JEE Mains 2014 (1.5+ million candidates)	Apr 2014