भारतीय प्रौद्योगिकी संस्थान तिरुपति
TIRUPATI

Vikas Kumar
MS (by Research)
Indian Institute of Technology Tirupati, India
✉ **cs21s001@iittp.ac.in** ✆ **+91-7860010819**

Education Details

Program	Institute	Year	%/CGPA
MS (by Research) CSE	Indian Institute of Technology Tirupati	Present	8.20
B.Tech CSE	Ambalika Institute of Management & Technology,Lucknow	2020	8.03
Class XII	Army Public School, Nehru Road, Lucknow	2016	86.6 %
Class X	Army Public School, Nehru Road, Lucknow	2014	9.2

Area of Interest

- Reinforcement Learning, Multi-agent Reinforcement Learning, Deep Learning, Machine Learning

Research Manuscripts

- "Emergence of Grounded, Optimally Compositional Spatial Language among Homogeneous Agents", currently under review in JMLR.
- "Emergence of linguistic recursive structure through bootstrapping and iterated learning", currently under review in UAI 2024.

Projects

- **Emergent language properties in multi-agent system using deep reinforcement learning (Research Project)**
  (**Guide :** Dr. Ajin George Joseph) **[June'18-Present]**
  - **Abstract**: This project delves into the core elements of effective human communication by introducing glossogenetics, a computational model. It employs a decentralized, multi-agent deep reinforcement learning framework, simulating primal communication mechanisms. Agents, equipped with local learning and neural cognitive faculties, engage in dialogues to mimic real-world scenarios. The study specifically emphasizes incremental learning through trial and error at the micro-level, fostering the emergence of successful and efficient communication patterns across the diverse agent population. This exploration sheds light on the intricate dynamics of communication within a rational human population, offering valuable insights for both theoretical understanding and practical applications.

- **Tic Tac Toe Reinforcement Learning Project: Teaching an AI to Play and Win (Course Project)**
  (**Guide :** Dr. Ajin George Joseph) **[Aug'2021 - Dec'2021]**
  - **Abstract**: The project focuses on creating a Tic-Tac-Toe-specific Reinforcement Learning (RL) agent, undergoing training via self-play scenarios and diverse opponent interactions. The RL agent autonomously learns optimal strategies and decision-making for high proficiency in gameplay, aiming to counter opponents effectively and strategically execute winning moves. The project's ultimate goal is to develop an intelligent agent showcasing prowess in mastering Tic-Tac-Toe complexities through rigorous RL training.

- **Developing a reinforcement learning model for crypto trading automation.**
  . **[Oct 2023 - Dec 2023]**
  - **Abstract**: This project involves building a sophisticated system for crypto trading automation by integrating various stages: data retrieval from Binance exchange, preprocessing and cleaning of the obtained data, formulating the trading problem as a Markov Decision Process (MDP) framework, and implementing advanced reinforcement learning algorithms such as Soft Actor-Critic (SAC) and Proximal Policy Optimization (PPO) to enable the agent to learn optimal actions of buy, sell, or hold in response to market conditions.

Relevant Courses

- Reinforcement learning algorithms
- Machine learning for image processing
- Computational methods in optimisation
- Advanced Data Structures & Algorithms

Technical Proficiency

Programming Languages	:	Python, C++, C
Deep Learning Frameworks	:	TensorFlow, PyTorch
Scientific Computing Libraries	:	Numpy, scipy
Reinforcement Learning Libraries	:	OpenAi Gym, stablebaselines, nnabla-rl
Tools	:	LaTeX

Experience

- **Teaching Assistant for Advanced Data Structure and Algorithms Lab (CS5191)**
  (**Guide :** Dr G. Ramakrishna) **[Aug 2021- Dec 2022]**

- **Teaching Assistant for Operating System Lab (CS305P)**
  (**Guide :** Dr Ajin George Joseph) **[Aug'2023 - Dec'2023]**

Achievements

- Achieved 7th place in the ZeltaLabs Untrade Crypto Trading Challenge at Inter IIT Tech 12.0.
- Recipient of Research Assistant Scholarship at Indian Institute of Technology, Tirupati by Ministry of Human Resource Development, Government of India.

Positions of Responsibility

- Placement coordinator for MS and PhD research Scholars in Placement Team.
- Coordinator for ICISS 2022 conference

References

Dr. Ajin George Joseph
Department of CSE,
IIT Tirupati,
India, 517619
ajin@iittp.ac.in