Abhinav Kumar Verma

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SUMMARY

Inspired by the unboundedness and the impact of AI on modern world, I have studied AI, DL, GNN, LLMs, and core mathematics to develop a deep intuition of AI algorithms. I have extensive experience in designing and leading LLM-based AI and telecommunication systems. With my unique professional and academic experiences, I aspire to bring the latest research and methodologies to create the most advanced AI systems.

EDUCATION

Indian Institute of Technology, Kharagpur, India 2014 – 2019

Dual Degree (B.Tech & M.Tech), Electronics & Electrical Communication Engineering

- M. Tech Specialization: Telecommunication System Engineering
- CGPA: 8.96/10 (9.49/10 in the final two years)

EXPERIENCE

Qualcomm India Private Limited, Hyderabad Jul 2019 – Jul 2023

Senior Engineer – Modem Systems Group

- Enhanced a proprietary high-bandwidth inter-chip communication protocol – Qlink through system design changes. Advanced its Python-based simulator to predict bandwidth and efficiency for upcoming modules.
- Led the Qlink system design with power and cost optimization initiatives for TauriM – a mid-tier chipset.
- Pioneered a power estimation framework for the SerDes of Qlink that utilized field and lab data to forecast the power consumption of unreleased chipsets securing a competitive advantage.
- Automated signal sanity reporting pipelines to eliminate repetitive tasks and reduce manual effort by 80%.

RELEVANT PROJECTS

Automated Reasoning System for ARC Prize 2024 (Link) May – Aug 2024

- Designed and developed a neuro-symbolic reasoning system that combines LLM-driven intuitive reasoning (System 2) with symbolic heuristic search (System 1) for ARC-style visual transformation tasks.
- Engineered a hierarchical pattern detection module based on a Domain Specific Library. Implemented a causation detection module to uncover and replicate latent input-to-output transformation rules automatically.
- Introduced adaptive learning loops over prompts, enabling the system to refine the causality hypothesis through self-improvement of the semantic prompts and symbolic Python code.

Multiagent Evolutionary Games on Strongly Connected Networks (Link) Oct 2022 – Dec 2023

- Architected a network simulator with intelligent agents at each node, enabling exploration of internal agent dynamics from an evolutionary game theory perspective during synchronous gameplay.
- Directed a small team to integrate statistical learning-based strategies into agent behavior and investigated conditions for stable and emergent dynamics, demonstrating leadership in complex systems research.
- Extended the capabilities of the *NetworkX* library by designing and implementing an algorithm to generate strongly connected, edge-critical directed graphs. Proved the correctness of the algorithms employed to formalize the theoretical underpinnings in a research paper. (Paper Link)

SKILLS

Programming Skills: Python, MATLAB, and C

Technical Expertise: Docker and Cloud deployment, Version Control, Embedded Hardware Development, Software packaging and deployment, Vibe Coding

RELEVANT COURSEWORK

Artificial Intelligence: Introduction to AI, Deep Learning, Reinforcement Learning, Graph Neural Networks

Computer Science: Algorithms, Computer Architecture and Operating System, Parallel & Distributed Algorithms

Mathematics: Linear Algebra, Probability & Stochastic Processes, Random Graph Theory, Game Theory

HONORS AND ACHIEVEMENTS

- Received a Qualstar and multiple ThankQ (token of appreciation) at Qualcomm.
- General Secretary of Technology at Vidyasagar Hall of Residence, IIT Kharagpur for the academic year 2015-16.
- Volunteered for two years in the Air Wing of the National Cadet Corps.