Mudit Verma

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EDUCATION

Arizona State University, Tempe, AZ — 2019 – Expected Fall 2024
Ph.D in Computer Science, Advisor : Dr. Subbarao Kambhampati, GPA : 4.0/4.0

Delhi Technological University (Delhi College of Engineering), New Delhi, India — 2015 – 2019
B.Tech in Information Technology, Advisor : Dr. Seba Susan, GPA : 9.6/10 (Gold Medalist)

WORK EXPERIENCE

Apple Inc — May 2023 – Sept 2023
Machine Learning Research Intern, Cupertino, CA

Hosts : Machine Learning Research (MLR) Group, Rin Metcalf and Barry Theobald.

- **Published** *(ICLR 2024)* **:** Hindsight PRIORs for Reward Learning from Human Preferences.

Apple Inc — May 2022 – Aug 2022
Machine Learning Research Intern, Cupertino, CA

Hosts : Machine Learning Research (MLR) Group, Rin Metcalf and Barry Theobald.

- **Published** (IROS RLCONFORM (Oral), NeurIPS HILL 2022) **:** Symbol Guided Hindsight Priors for Reward Learning from Human Preferences.

Intel Corporation — May 2021 – Aug 2021
Deep Learning Software Engineering Intern, Santa Clara (Remote), CA

Deep Learning Acceleration and implications to explainability. Host : Wei Wang

- First analysis of float32 ResNet50 on Intel IceLake (ICX, market impact : $140M) with proposed BFloat16 optimizations, **enabling CPU deployment of quantized models for four Intel MLPT teams.**
- Revealed differences in Saliency Based explanations in Quantized ResNet50 for CPU ICX deployment.

Samsung Semiconductor India Research — May 2018 – Aug 2018
Machine Learning Intern, Bangalore, India

Worked on implementing a DRAM bank simulator followed by Redundancy Analysis . Host : Atishay Kumar

- Implemented C++ based DRAM Simulator, **(400x faster than baseline)** with enhanced Fault Classes.
- Proposed : Monte Carlo Tree Search (with state space reduction) using Residual Network based heuristic.
- This is the **best known solution (as of 2022).** Awarded Best Intern Project at SSIR.

Samsung Semiconductor India Research — May 2017 – Aug 2017
Machine Learning Intern, Bangalore, India

Worked on reducing write-wearing and improving garbage collection in SSDs. Host : Sandeep Sammatshetti

- Identified fault classes in SSDs. C++ bindings on Python UI to simulate SSD reads/write/garbage collection.
- Proposed : LSTM based Stream Selection for Smart Data Categorization **(28% improvement over baseline)**
- Runners up Best Intern Project at SSIR.

SELECTED HONORS & AWARDS

ASU SCAI Doctoral Fellowship ($9300)	2024, 2023, 2019
ASU Engineering Graduate Fellowship ($3000)	2022
Delhi Technological University /DCE Gold Medalist	2019
Delhi Technological University Department Merit Rank Scholarship ($1500)	2019, 2018, 2017
Pramod Jain Scholarship, Best Student at Delhi Technological University ($1200)	2017
First, Smart India Hackathon. Varanasi, India. (37000+ submissions) ($1700)	2019
Education Innovation Mentorship Programme, ReadAlliance USAID (highly selective) ($15,000)	2018

SKILLS

Programming: C++, Python, PDDL, HDDL. **Frameworks:** Deep Learning (PyTorch, Jax, Tensorflow), Reinforcement Learning (Stable-Baselines, ACME, Dopamine, Mujoco-Gym, OpenAI-Gym, D4RL), Large Language Models (HuggingFace, OpenAI, DeepSeed), Machine Learning (Scikit-learn, NumPy, Pandas, Matplotlib, OpenCV, Matplotlib, Graphviz, WandB, Tensorboard). **Setups:** Docker, Headless Computing, Multi-GPU and Single GPU nodes (Large Scale Training). **Other Interests:** Android/Web Development (Flask, D3, HTML/CSS/JS, SQL). **Research :** Embodied AI, RLHF, LLM, Safe AI, Personalized AI, AI Agents

SELECTED PUBLICATIONS & PREPRINTS

Overview: Published >20 papers combined in conferences and workshops at venues such as NeurIPS, ICLR, HRI, AAAI, ICML, AAMAS, IROS, ICAPS. Work in my main line of research includes :

- **Hindsight PRIORs for Reward Learning from Human Preferences.**
  International Conference on Learning Representations (ICLR) 2024
- **Theory of Mind abilities of Large Language Models in Human-Robot Interaction : An Illusion**
  Conference on Human Robot Interaction (HRI) 2024 ***(Oral)*** *; Invited Talk: Apple MLR, AGI Leap Summit 2024*
  Previously : ICML *Theory of Mind Workshop 2023, ICML Many Facets of Preference Learning 2023* ***(Oral)***
- **LLMs Can't Plan, But Can Help Planning in LLM-Modulo Frameworks.**
  Position Paper : *arXiv Preprint* 2024
- **Widening the Pipeline in Human-Guided Reinforcement Learning with Explanation and Context-Aware Data Augmentation.**
  Conference on Neural Information Processing Systems *(NeurIPS) 2021* ***(Spotlight)***
- **Exploiting Action Distances for Reward Learning from Human Preferences.**
  Many Facets of Preference Learning Workshop at MFPL ICML 2023, AAAI R2HCAI 2023
- **Symbol Guided Hindsight Priors for Reward Learning from Human Preferences.**
  IROS RLCONFORM, NerurIPS HILL 2022 ***(Oral)***
- **Benchmarking Multi-Agent Preference based Reinforcement Learning for Human-AI Teaming.**
  (Invited AAAI 2024 Ad Hoc Teamwork Talk)
- **Bridging the Gap: Providing Post-Hoc Symbolic Explanations for Sequential Decision-Making Problems with Inscrutable Representations.**
  International Conference on Learning Representations (ICLR) 2022, Previously in : ICML HILL 2020
- **Symbols as a Lingua Franca for Bridging Human-AI Chasm for Explainable and Advisable AI Systems.**
  Association for the Advancement of Artificial Intelligence AAAI 2021 ***(Blue Sky Track)***

OTHER PROJECTS

- **Perfect Observability is a Myth** (*LTLs, PyTorch, OpenAI-Gym, BabyAI*) with Dr. Siddharth Srivastava
  - Integrated Linear Temporal Logic with Partially Observable Markov Decision Processes for advising agents in Reinforcement Learning amidst human partial observability.
- **Randomly Wired Networks are on the rise, have we been creating wrong Networks all along?** (*NetworkX, PyTorch, Matplotlib*). With Dr. Joshua Daymude.
  - Proposed MCMC method for studying randomly wired neural networks (AutoML), demonstrating comparable performance to carefully designed architectures on Iris and ImageNet-Small.
- **Colors of Desert** (*D3, HTML, JS, CSS, BeautifulSoup, Google-Firebase*) With Dr. Sharon Hsiao.
  - Interactive D3 web visualization of Arizona Desert's flora and fauna using color perspectives for navigation, akin to YouTube's recommender system.
- **User Study Interfaces** (*Flask, Firebase-Console, Jinja2, HTML, JS, CSS, JQuery*)
  - Implemented a Flask-Jinja2 based extendable User Study Template to conduct user studies on online services like Prolific, Amazon MTurk. Used in six user studies totalling over 700 participants.

TEACHING & SERVICE

Teaching Assistant, CSE 471 with Dr. Subbarao Kambhampati. Fall 2019
Reviewer/PC Member, ICML (2024, 2023, 2022); NeurIPS, (2023, 2022); ICLR(2024, 2023, 2022), IJCAI(2024), ICAPS, (2023, 2022, 2021); AAAI (2023, 2022), HRI (2022), BayLearn (2023) and several IEEE venues.