SHLOK TOMAR

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EDUCATION

Washington State University — Pullman, USA
Master of Computer Science (Thesis) ***Prof (Dr.) Janardhan Rao Doppa*** ***GPA**: 3.9/4.0* — *Expected Jan 2025*
Relevant Coursework: Neural Network Design, Big Data Analysis, Reinforcement Learning and Advanced Algorithms

Amity University — Noida, India
Bachelor of Science in Computer Application ***GPA**: 3.8/4.0* — *Graduated May 2022*

SKILLS

- **Technical Skills**: Python, C++, C, R, BoTorch, TensorFlow, PyTorch, Image Processing, Data Analytics, Data Visualization, MySQL, MongoDB, Azure, AWS, HTML, CSS, and BoTorch
- **Soft Skills**: leadership, Team Collaboration, Problem-Solving, Critical Thinking, Time Management

WORK EXPERIENCE

Washington State University — Pullman, WA
Project Lead AI/ML - LLM Researcher — *Aug 2023 –Present*

- Pioneered **BODE-GEN**, a Bayesian Optimization framework for LLM-driven program synthesis, achieving **96% pass@1 accuracy** on HumanEval+ benchmarks with models like ChatGPT-3.5, DeepSeek-Coder-33B and CodeLlama-7B, validating scalability and robustness
- Integrated an **auxiliary LLM** to bridge discrete prompt and continuous embedding spaces using **Gaussian Processes**, **random projections**, and **dimensionality-scaled priors** for surrogate modeling in sparse data settings.
- Achieved **37% accuracy improvement** and reduced prompt iteration counts by **13x** compared to baseline methods like CoT and OPRO.
- Submitted first authored researcher in top-tier conferences, Mentored **Undergraduate researcher**, guiding in Bayesian optimization techniques and scalable LLM integration for AI applications

UC Berkeley & United States Department of Agriculture (USDA) — Berkeley, CA
Summer Research Intern — *May 2023 – Aug 2023*

- Independently developed deep/machine learning models from scratch to estimate the prevalence of chronic wasting disease (CWD) in wild cervid population.
- Conducted spatial and temporal analyses using National Satellite Imagery, achieving a **96.4% accuracy**
- Worked directly with US Government's ***SCI-Net High-Performance Computing*** (HPC) unit to optimize computational workflows and improve model **efficiency** by **67.3%**

Defense Research & Development Organization (DRDO) — Noida, India
Researcher and Lead Developer (Internship) — *Sept 2021 – Jan 2023*

- Selected as the only undergraduate to work on an AI-based human Identification in low accuracy conditions.
- Built a comprehensive dataset of human skeletal features using **Python** and **Pandas**, and applied machine learning models for prescriptive analysis, achieving **improved identification accuracy**.
- Designed and presented **3D visualizations of ML outputs** during project update meetings.

Microsoft — Roorkee, India
Internal Technology Intern Future Ready — *Sept 2021 – Feb 2022*

- Developed an in-depth understanding of **Azure**, Machine Learning, AI, and Computer Vision tools through a series of application-based group projects, led by Microsoft engineers.
- Created an immersive, **AI-enabled windows application** to detect improper body postures during exercise.

PUBLICATIONS

- **Shlok Tomar,** Aryan Deshwal, Ethan Villalovoz, Haipeng Cai, Janardhan Rao Doppa. *Test-Driven Code Generation using LLMs via Bayesian Optimization*. In Proceedings of the 2025 AAAI Conference on Innovative Application of Artificial Intelligence (IAAI 2025) (Under Review)
- **Shlok Tomar,** Aryan Deshwal, Ethan Villalovoz, Mattia Fazzini, Haipeng Cai, Janardhan Rao Doppa. *Sample Efficient LLM-Driven Program Synthesis: A Novel Bayesian Optimization Approach*. In Proceedings of the 2025 IEEE/ACM International Conference on Software Engineering (ICSE 2025) (Under Review)

SELECTED PROJECTS

FBI Hate Crime Data Analysis — *Apr 2022*

- Analyzed FBI's annual hate crime dataset to draw insights on racial hate crime trends by factors such as bias criteria, geography, and frequency of crime

- Pre-processed and cleaned 21,000+ data entries with Pandas, decreasing processing time by 34 %
- Visualized data trends using Pandas and matplotlib to help improve analysis interpretation with users

LEADERSHIP/ VOLUNTEERING

Delegate, Harvard Project for Asian and International Relations (HPAIR) *June 2024*

- Accepted for the prestigious international conference focused on addressing key global issues in Asia and beyond.
- Engaged in high-level discussions and workshops on international relations, economic development, and innovation
- Networked with global leaders, policymakers, and distinguished academics to foster cross-cultural collaboration.