Shobhit Sinha

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EDUCATION

University of Illinois Urbana-Champaign – Grainger College of Engineering *December 2025*
Bachelor of Science in Computer Engineering, Minor in Statistics **GPA: 3.72/4.0**

- James Scholar Honors Program and Dean's List
- Relevant Coursework: Computer Systems Engineering, Database Management Systems, Data Structures and Algorithms, Text Information Systems, Electrical and Electronic Systems, Linear Algebra with Computational Applications.
- Involvements: Consultant @ EntreCORPS, Startup Incubator @ Z2O VC, Illinois Data Science, Illinois Solar Car

SKILLS

Programming Languages: Python, C/C++, R, SQL, CUDA, HDL(System Verilog), Assembly Language
Frameworks & Libraries: PyTorch, TensorFlow, Transformers, NumPy, spaCy, NLTK, Matplotlib
Tools & Platforms: Microsoft Azure, Git, Docker, GDB, Conda, Flask, PyQt, Arduino
Skills: AI/ML, NLP, LLM Fine-Tuning, GenAI, API Integration, Full-Stack, FPGA Design

EXPERIENCE

University of New South Wales - School of Computer Science and Engineering **Sydney, Australia**
AI Researcher on Generative Artificial Intelligence and Large Language Models (GenAI & LLM) *May 2024 – Present*

- Secured a competitive scholarship under Professor Flora Salim to publish papers on generative AI agent structures.
- Worked on integrating personality and memory generation into AI agents using LLMs such as GPT and LLAMA.
- Utilized AI and Machine Learning tools, including PyTorch and Transformers, to optimize predictive models.
- Developed custom memory management algorithms to enhance the efficiency of AI agents.
- Leveraged spatial analysis and coordinate mapping to improve contextual understanding and agent interactions.

Illini Electric Motorsport **Urbana, IL**
Software Team - Battery Management System Viewer *September 2024 – Present*

- Collaborating on developing a real-time BMS Viewer for battery data visualization using CAN Bus communication.
- Refactoring the user interface with PyQt, incorporating multithreading to enhance data rendering speed and responsiveness.
- Implementing unit tests to ensure maintainability, scalability, and compliance with industry standards.

PROJECTS

Dynamic Reading Companion - *LLMs, API Integration, Full Stack Development* *Sept. 2024*

- Engineered a platform using LLMs for text summarization and sentiment analysis, generating playlists and boosting engagement by 30%.
- Integrated APIs (OpenAI, Spotify, Gutendex) to streamline data processing and enable real-time summary generation, reducing response time by 20%.

Building and Fine-Tuning a Large Language Model (LLM) - *PyTorch, LLMs* *August 2024*

- Designed and fine-tuned a transformer-based LLM using PyTorch, incorporating techniques from Sebastian Raschka's book.
- Optimized training with efficient weight loading and LoRA-based methods, reducing training time by 20%.
- Built an optimized tokenizer, improving efficiency and boosting inference speed by 25% through advanced data structures.

Sentiment Analysis on Social Media and Reviews - *Natural Language Processing, Deep Learning* *July 2024*

- Conducted sentiment analysis on Amazon reviews and Tweets using deep learning approaches, achieving over 85% accuracy.
- Applied NLP preprocessing techniques, including tokenization and lemmatization, to improve model performance.
- Utilized Matplotlib for data visualization and reduced preprocessing time by 50% through optimized data handling techniques.

FPGA Golf Game - *SystemVerilog, FPGA Development* *May 2024*

- Developed a mini golf game on FPGA using SystemVerilog, integrating USB controls and VGA/HDMI display.
- Optimized BRAM to 89% for efficient graphics storage and utilized a MicroBlaze processor for SoC integration.
- Implemented game logic with finite state machines for ball movement, collisions, and real-time scoring.
- Designed and tested UART and SPI communication, achieving 100% system functionality using Vivado for debugging.

PROFESSIONAL CERTIFICATION

IBM – Deep Neural Networks with PyTorch *June 2024*
IBM - Data Structures & Algorithms and Object-Oriented Implementation in C++ *May 2024 – Present*
DeepLearning.AI and AWS – Generative AI with Large Language Models *Jan. 2024*