Harshitha Pydimalla

Formal Verification Engineering Internship

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Professional Summary

Master's graduate in Artificial Intelligence with strong foundations in computer science, machine learning, and formal methods. Experienced in working with proof assistants (Coq, Isabelle, Z3) and developing AI-powered tools for verification and theorem proving. Skilled in Python, formal modeling, and system architecture analysis, with academic exposure to computer architecture and hardware verification concepts. Eager to contribute to Qualcomm's CPU design team by applying formal verification techniques to ensure correctness and reliability of complex designs, while deepening expertise in Verilog HDL and industrial-scale formal sign-off environments.

Skills

Programming Languages & Tools: Python, C++, Java, Matlab, SQL, NumPy, Pandas, Jupyter Notebook, TensorFlow, PyTorch, Git, GitHub, C#, JavaScript, HTML, CSS
Formal Methods & Verification: Formal Verification, Model Checking, SAT/SMT Solvers (Z3), Proof Assistants (Coq, Isabelle, Lean), Assertion-Based Verification, Specification & Refinement
Computer Science & Engineering: Computer Architecture, Verilog, SystemVerilog, Data Structures & Algorithms, Object-Oriented Programming, API/JSON Integration
Mathematics & Algorithms: Logic, Discrete Mathematics, Probability & Statistics, Optimization, Predictive Modelling
Machine Learning & AI (Complementary): Machine Learning, Deep Learning, Natural Language Processing, Neural-Symbolic AI, Computer Vision & Image Processing (OpenCV, LBPH)
Statistical & Time Series Analysis: Statistical Analysis, ARIMA, SARIMA, Load Forecasting
Data Visualization: Matplotlib, Seaborn
Soft Skills: Problem-Solving, Analytical Thinking, Team Collaboration, Communication, Adaptability, Attention to Detail, Time Management, Multitasking, Ownership Mindset, Enthusiasm to Learn

Projects

Web Traffic Time Series Forecasting   02/2025 – 05/2025
- Developed time series forecasting models to predict future pageviews of Wikipedia articles across multilingual languages.
- Used SARIMA model with log-transformation and seasonal differencing to capture weekly and yearly patterns.
- Applied chronological train/validation/test split to ensure robust evaluation and prevent data leakage.

Tools: Python, Pandas, Statistical Models (SARIMA), Matplotlib, NumPy, seaborn, scikit-learn

Analysis of Physical and Mental Health Issues due to   01/2023 – 04/2023
excessive screen time in youngsters
- This project analyzes the effects of excessive screen time on the physical and mental health of individuals aged 16-2 using survey data from 685 students.

- After cleaning and encoding the data, statistical tests identified significant links between screen time and health issues. A Random Forest model was developed to predict the negative impact of screen time over four hours, achieving 100% accuracy.
- Findings reveal that extended screen use is associated with headaches, sleep problems, back pain, and decreased physical activity, highlighting the need for balanced digital habits to support better health.

Tools: Survey & Data Analysis, Random Forest, CHI-Square test, Feature Correlation Analysis, Feature Engineering.

Face Recognition using LBPH Algorithm   02/2022 – 03/2022

- Developed a face recognition system using the Local Binary Patterns Histograms (LBPH) algorithm to identify and verify individuals from images.
- The project involved preprocessing face images, extracting facial features with LBPH, and training a classifier for accurate recognition.
- The model demonstrated robustness to variations in lighting and facial expressions, making it suitable for real-time applications like access control or attendance systems.

Tools: Python, Machine Learning, OpenCV, Image processing, Numpy, scikit-learn, Jupyter Notebook

AI-Powered Web Support for Formal Verification and   04/2025 – 09/2025
Proof Assistants

- Developed *AxiomAI*, a web-based platform combining Large Language Models, Retrieval-Augmented Generation (RAG), and a Proof API to support learning and experimentation with proof assistants (Coq, Isabelle, Z3).
- The system enables users to ask natural language queries via a chatbot in two modes (LLM-only, LLM+RAG) and generate proof snippets, with live execution supported in Z3. Designed modular backend services (FastAPI, Flask) and a lightweight frontend with metrics logging for latency, accuracy, hallucination rate, and proof success rate.
- Evaluations showed RAG significantly improved factual grounding and reduced hallucinations compared to LLM-only baselines. The project demonstrates how AI can lower the entry barrier to formal verification while providing an extensible research and educational tool.
- **Tools:** Python, FastAPI, Flask, HuggingFace Transformers, FAISS, BM25, Hybrid retrieval, Z3, Coq, Isabelle, JavaScript, HTML/CSS, KaTeX, Prism.js, Stanage HPC, GitHub

Education

Karunya Institute of Technology and Sciences   06/2019 – 07/2023
Bachelor of Technology in Computer Science and   Coimbatore, Tamil Nadu
Engineering
- Secured an overall percentage of 70.11%

The University of Sheffield   09/2024 – 09/2025
Masters in Artificial Intelligence   Sheffield, United Kingdom

Extracurricular Activities

Member of National Service Scheme   07/2019 – 04/2023

Member of Nature Club   01/2022 – 04/2023

Interests

Reading | Theological Reasearch | Singing | Travelling

Languages

English ● ● ● ● ●   Telugu ● ● ● ● ●

Hindi ● ● ● ● ○   Tamil ● ● ○ ○ ○