PIYUSH PANWAR

Software Engineer | AI/ML Statistical Modeling

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EXPERIENCE

AI/ML Intern

Detoxio AI

June 2025 – Sept 2025 **Remote**

- Developed **AI agent configurations** to test models and improve the efficiency of the **red teaming** process.
- Tested models from **Ollama** and **Hugging Face** to identify vulnerabilities like **Jailbreaking** and adversarial attacks.
- Automated testing workflows using **NOX**, which reduced manual work and increased testing speed by 40%.

Research Intern

Statistical Modeling (Academic)

Oct 2025 – Present **Remote/Academic**

- **Conducted** a Monte Carlo simulation study to estimate **Stress-Strength Reliability** (SSR) for the **Xgamma-Exponential** (Xg-E) distribution.
- **Implemented** advanced **MLE** techniques under **GPHC** and **Debugged** a fundamental error in the core mathematical expression for SSR.
- **Used Parallel processing and Numba (JIT)** to speed up the simulation, running 10,000 replications efficiently with high precision.
- **Analyzed** simulation outputs using Matplotlib and Pandas to compare the theoretical models against the simulation data.

Open Source Contributor (ArviZ)

ArviZ – Bayesian Analysis Library

Jan 2024 – Present **Remote**

- **Implemented** computational features, including `bayes_factor()` and `plot_ppc_intervals()`) for advanced **Bayesian Model Comparison** and validation.
- **Refactored** plotting modules to improve code organization and separate logic from visualization, making the codebase easier to maintain..
- **Wrote unit tests** using Pytest and followed Test-Driven Development (TDD) principles to fix bugs and improve test coverage for statistical functions.
- **Updated** core statistical logic (like KDE) to meet open-source coding standards and improve consistency across different visualization backends.

Detailed Contributions: View Portfolio of 8+ Merged Pull Requests

EDUCATION

B.Tech. (CSE) - 8.62 CGPA

Polaris School of Technology (Starex University)

2023 – 2027 Gurugram, Haryana

TECHNICAL SKILLS

- **Languages:** Python (Numba/JIT), SQL, Java, JavaScript
- **AI & GenAI:** Hugging Face, Ollama, XGBoost, Scikit-learn, Optuna, Model Validation
- **Statistics & Research:** Bayesian Inference (ArviZ), MLE, Survival Analysis, Pytest, Hypothesis Testing
- **Data Science:** Pandas, NumPy, Matplotlib, Seaborn, Plotly, Bokeh, Streamlit
- **Web & Tools:** Git, Docker, Sphinx, REST APIs, Postman, React.js, HTML/CSS
- **Core Concepts:** Data Structures, Algorithms, Code Refactoring, Statistical Analysis

ACHIEVEMENTS

- **"First Runner-Up in Hack With Uttarakhand (Team Code Heist)** - led a 36-hour offline hackathon with innovative problem solving and teamwork.'
- Contributed to **[Open Source]** initiatives including **HacktoberFest, GirlScript**, enhancing real-world software development skills.

PROJECTS

Credit Risk Prediction System

- **Python | Scikit-learn | XGBoost | Optuna**
- Built a credit risk scoring model that classifies borrowers into four risk tiers and assigns credit scores (300–900).
- Created financial features like Loan-to-Income and Utilization Ratios, and used **Optuna** to tune the model for better accuracy (AUC-ROC).
- Developed a **Streamlit** dashboard to display real-time risk analysis and insights for loan approval decisions. [GitHub]

Health Insurance Premium Prediction

- **Python | XGBoost | Linear Reg. | Statistics**
- Built a prediction model achieving **98% accuracy** by segmenting data into "Young" and "Rest" groups to handle demographic differences.
- Reduced extreme prediction errors (from 27% to 2%) by adding a **"Genetic Risk"** feature for the under-25 demographic.
- Used **Variance Inflation Factor (VIF)** analysis to remove multicollinearity ensure the model was stable and interpretable. [GitHub]