**Project: AI-Driven Hybrid Workflow for Anomaly Detection and Predictive Insights**

**Project Description:**
The interns will develop a hybrid AI platform that combines traditional machine learning with large language models (LLMs) to analyze system logs and performance metrics. The goal is to detect anomalies, forecast trends, correlate alerts, and generate actionable insights in natural language. The project will leverage cloud-native services for data ingestion, ML model deployment, and LLM-driven interpretation. This project will be performed by 2–3 students.

**Why It Matters / Global Impact:**
Modern enterprises generate massive volumes of operational data, yet most of it remains underutilized. By integrating ML-based anomaly detection with LLM-powered correlation and explanation, this project will demonstrate how AI can reduce operational noise, improve reliability, and surface valuable business insights. The outcome has wide relevance across industries such as cloud infrastructure, mobility, fintech, and digital healthcare.

**Objectives:**

* Implement anomaly detection using classical ML algorithms (Isolation Forest, LOF, Autoencoders).
* Build predictive analytics models for time-series forecasting of system performance metrics.
* Develop event correlation mechanisms across logs and alerts to reduce noise.
* Integrate LLMs to interpret results and generate actionable narratives for decision-making.

**Deliverables:**

* Functional hybrid ML + LLM workflow prototype.
* Dashboards and APIs showing anomaly detection, predictions, and correlated incidents.
* Insight reports demonstrating non-obvious findings from historical data.
* Technical documentation and guidelines for deployment.

**Milestones (6 months):**

* **Weeks 1–2:** Requirement analysis, data ingestion pipeline setup, and tool familiarization.
* **Weeks 3–6:** Development of anomaly detection and forecasting models.
* **Weeks 7–10:** Implementation of event correlation and integration with visualization tools.
* **Weeks 11–14:** LLM integration for narrative generation and actionable insights.
* **Weeks 15+:** Testing, optimization, documentation, final evaluation, and presentation.

**Intern Background:**

* Strong programming skills in Python.
* Familiarity with ML/AI frameworks (scikit-learn, PyTorch, or TensorFlow).
* Knowledge of time-series forecasting and anomaly detection.
* Interest in Large Language Models and cloud-native services.

**Supervisors:**

* Mahbubul Alam (LinkedIn)
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