# ABSTRACT

During my impactful six-month internship at the BEL Smart City Division, I independently designed and developed an advanced, real-time **Performance Monitoring System with AI-Powered Anomaly Detection**. This intelligent platform addressed critical infrastructure observability needs by continuously tracking essential system metrics like **CPU usage, memory consumption, and load averages**.

The system's **backend**, built with the **Flask web framework**, provided robust **RESTful API endpoints** and comprehensive logging. For the **frontend**, I used **HTML, CSS, and JavaScript** with **Chart.js** to create dynamic, real-time visualizations of performance data, offering immediate insights to administrators.

A key innovation was the integration of **AI for anomaly detection**, leveraging the **Isolation Forest algorithm** to proactively identify abnormal patterns indicating potential system failures. Upon detection, the system automatically sent **real-time email alerts** to designated administrators, enabling swift incident handling.

To ensure seamless deployment and scalability, the entire system was **containerized using Docker** and deployed on **Render**, supporting version-controlled deployments via **Git**. Developed from scratch within a production-facing smart city context, this modular and scalable solution demonstrates the effective integration of **AI and modern DevOps tools** to build intelligent monitoring solutions for critical infrastructure environments.