ABSTRACT

Energy consumption is a significant concern for households and businesses, impacting both costs and sustainability. The **AI-Powered Smart Energy Consumption Tracker** is a web-based application designed to help users monitor their electricity usage and optimize energy consumption. By leveraging **AI-driven analytics**, the system predicts electricity usage trends, offers personalized energy-saving recommendations, and detects unusual energy spikes that may indicate faulty appliances or unnecessary usage.

The application is built using **React.js (Next.js) for the frontend**, ensuring a seamless and responsive user experience, while the backend is powered by **Django or FastAPI** with **PostgreSQL** for efficient data management. AI models, developed using **TensorFlow or Scikit-learn**, analyze historical consumption patterns to provide actionable insights.

Additionally, the system can integrate with **IoT devices (ESP32/Raspberry Pi)** for real-time energy tracking, enhancing accuracy and responsiveness. By combining advanced AI capabilities with user-friendly visualization tools, this tracker empowers individuals and businesses to **reduce electricity bills, enhance energy efficiency, and contribute to a more sustainable future**