

Hackathon: Edge Runners 3.2

# **EdgeAI Vision:**

## **Intelligent Image-Based Fault Detection and Diagnosis**

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# Problem Overview

- Infrastructure damage and faults (cables, wires, switches) often go unnoticed until failure.
- Manual inspection can be inefficient, time-consuming, and prone to human error.
- There's a need for a more automated, real-time, and precise detection mechanism, especially in edge environments.



# Project Introduction

- ▶ Leverages Llama 3.2 90B Vision Instruct Turbo for real-time image analysis.
- ▶ Detects infrastructure issues (wires, switches, cables) in uploaded images.
- ▶ Provides an introduction to the issue, causes, and actionable recommendations for repair.
- ▶ Combines powerful edge AI processing with network-enhanced features for greater accuracy.



# Features & Functionality

- **Real-time Fault Detection:** Automatically identifies problems in images.
- **Detailed Analysis:** Highlights specific components (e.g., cables, wires, switches) with issues.
- **Problem Diagnosis:** Provides root causes and possible impacts.
- **Solution Recommendations:** Suggests materials and steps to solve the problem.
- **Enhanced Accuracy:** Uses powerful AI models for precise fault localization.



# Technology Stack

- **Llama 3.2 90B Vision Instruct Turbo:** For high-level analysis and problem detection in images.
- **Python & Streamlit:** Web interface for user interaction and image upload.
- **OpenCV:** For image processing and highlighting problem areas.
- **Together.AI API:** For connecting the AI models and handling real-time image inputs.





# Impact & Future Scope

## **Impact:**

- Helps improve infrastructure reliability.
- Reduces downtime and repair costs.
- Accelerates troubleshooting in underserved areas.

## **Future Enhancements:**

- Support for larger datasets for training.
- Integration with IoT devices for live monitoring.
- Expanding model capabilities to analyze videos in real-time.



# Thank you

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