# Project Report

## Project Title: Vision Transformer for Powerline Damage Detection from Satellite Imagery

🧠 Goal: Use a Vision Transformer (ViT) model to classify satellite images for grid infrastructure damage (e.g., storms, fallen lines).

## Dataset

• XView2: Satellite Building Damage Assessment

## Technology Stack

• Vision Transformer (ViT)  
• HuggingFace Transformers  
• Albumentations (Data Augmentation)  
• TensorBoard (Training Visualization)

## Implementation Steps

1. Preprocess satellite imagery.  
2. Train Vision Transformer on labeled damage vs. no damage imagery.  
3. Optionally output bounding boxes or segmentation masks for damaged regions.

## Project Significance

✅ This project combines computer vision transformers with utility grid infrastructure monitoring, making it highly aligned with smart utility research. It is particularly relevant to the research interests of Prof. Md. Yusuf from UMKC, Missouri, who focuses on smart grids, infrastructure monitoring, and cyber-physical systems.