

## **ABSTRACT**

### **Intelligent UAV-based Machine Learning for Powerline Problem Detection and Classification**

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As per the statistics provided by the U.S. Department of Energy, transmission system in the United States is made up of roughly 160,000 miles of high voltage transmission lines. To guarantee uninterrupted power delivery and grid stability, regular maintenance and monitoring of power line damages are essential. The power transmission lines and tower market size value are set to grow at a 4% CAGR between 2021 and 2028. A defective electrical line that goes undetected could cause wildfires, fatalities and other types of devastation.

Traditionally power companies use manual inspection which requires a human operator to physically go to the location and check for anomalies. This method may cause a delay in response to the anomalies as it may not be efficient in covering vast areas and is considered to be expensive. This made it necessary to establish a system that works effectively with minimal human intervention, cost, and time.

In this project, we propose an approach to eliminate the need for manual inspection by using UAV. It helps in preventing any human error and enables precise tracking of power line faults. We plan to use Machine Learning algorithms to train the system for power-line faults detection and classification. We anticipate having a portal at the end of this project where users can upload input and the trained machine learning model detect the power line components, identifying the faults by further classifying the faults into its subclasses (broken wires, missing insulator plates, vegetation on powerlines, etc.) and report details of the detected anomalies in components on the user interface.