

# Florida Light and Power Image Recognition for Pad Mounted Equipment

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## Abstract

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February 21<sup>th</sup>, 2022



## **Abstract**

Pad mounted transformers are responsible for lowering voltages to the standard household levels. Florida Light and Power (FPL) includes devices called fault current indicators within their transformers. When an area has lost power, these indicators detect whether their transformer's current is faulty. However, FPL teams must manually check the indicator within each transformer to locate a fault, which is a time consuming and challenging procedure. Team 304 is tasked with detecting faulted transformers using computer vision. This goal is inspired by how FPL's existing drone program locates damage on powerlines. The solution's design includes a physical beacon that visually indicates faults and a computer vision system that recognizes the beacon.

The beacon must be reliable and weather resistant without interfering with a transformer's normal operation. It is securely mounted to the transformer's exterior while connecting internally to the fault current indicator. When the beacon receives power, a spring will release it into an upright position and its LED light will turn on. FPL Air, a drone program, captures video of the beacon. This footage is sorted by location and sent to the model.

The second design component is a computer vision system that can detect the transformer, beacon, and beacon state. This utilizes the algorithm You Only Look Once (YOLO). YOLO can accurately detect objects in real time footage. To train the algorithm, an expansive image library is collected. These images contain a variety of angles, environments, and states. The model then trains on different image combinations and is tested. The test results are used to update the image

library and optimize the model

In summary, this project develops a method of visually indicating faults and detecting them using computer vision. The solution speeds the process of locating a faulted transformer and reduces the time it takes for FPL to return power to an area.