**Project Abstract**

Batch :7

Title : Autonomous substation robot

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Abstract:

In the present scenario, in substations there are situations where maintenance is done after the occurrence of the fault. During the time of occurrence of the lightning/fault repairing of the fault or analyzing the issue is highly risky for the operators. In these kinds of situations, the power system stability is highly affected moreover the service provider suffers huge loss in revenue generated. The current substation robots deployed uses closed source hardware and software, which affects its flexibility of implementation in local scenarios.

Our robot is designed to overcome these limitations using opensource hardware and software, thereby improving safety requirements. It is possible to remotely operate the robot using IOT interface before the repair team/wing arrives at the site and assess the situation without a direct human presence at the site. The robot is able to perform autonomous movements/navigation by means of running SLAM algorithm and/or A\* algorithm on ROS (preferably running on a Linux distro). The data collection at site is done by thermal imaging to find anomalies invisible to naked eyes (Hotspots after faults, abnormal machine working situation), normal camera to conduct visual inspection and read gauges (preferably using OPENCV library or TF API from google). Compared to traditional substation robots our robot can feed audio from site to control server/operator for acoustic inspection. Other than this the robot can also take count of lightning by measuring the vhf burst count and calculate distance from lightning by combining image and sound data. All this data collected can also be used along with Scada data of substation to predict occurrence of fault by training an AI model.