Transmission-Line Assessment and Review System (TARS): An AI and Robotics Enabled Drone for the Inspection and Maintenance of High Voltage Transmission Lines

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Working on high voltage power lines is a hazardous task, and the risks associated with this type of work are numerous and significant, proven by the electrical industry’s high mortality rate. Power line workers face numerous hazards every day, such as working in extreme weather conditions, at high elevations, and with heavy equipment, which can result in falls, electrocution, and other types of injuries. The TARS project aims to reduce these risks by using a robotic drone to perform inspections and minor maintenance, eliminating the need for workers to climb towers and perform these tasks manually. Its translating pulley system helps it roll across the lines, even when faced with obstacles like spacers and dampers. One of the key features of TARS is its ability to operate independently. Its camera and robotic arm system allow it to inspect and repair transmission cables with minimal human intervention. The camera's AI capability enables it to automatically detect and identify corrosion or damage. Once damage is detected, TARS automatically triggers an alert to the operator, whether in proximity to TARS or operating remotely, including the geo-location of the damage. It can also perform minor repairs using its robotic arm, such as installing dampeners and re-tensioning spacers. By eliminating the need for workers to climb tall transmission towers and handle live wires, TARS reduces the risks faced by power line workers. Its efficient and accurate inspections and minor repairs also improve the overall efficiency of power line maintenance, reducing downtime and costs. The TARS project offers a promising solution to address the high mortality rate in the electrical industry by using a robotic drone to perform inspections and minor maintenance on live power lines.

Awards Won:

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