

## Abstract

FPL currently follows a 18-step process to inspect utility poles. Pole are inspected rotationally every eight years and there are over two million utility poles in Florida. Additionally, poles are briefly inspected prior to linemen servicing them. An incident occurred when a lineman was servicing a pole believed to be safe. As the lineman was climbing, the pole snapped.

The team will be designing and building a pole climbing robot with health sensing capabilities to automate and simplify the pole health inspection process.

## **Project Scope**

- Improve safety and reliability
- Reduce resources needed to inspect poles
- Increase inspection efficiency
- Automate and simplify pole health inspection process



Figure 1: Concept image of final design





# **Pole Health Detection Sensor**

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Figure 2: Image of intended robot design

Figure 3: Example of GPR readings



Figure 5: Block diagram of design

Figure 4: Sample GPR output image



### **Proposed Design**

- **Robot:** Triangle Climber
- Sensor: Ground Penetrating Radar
- **Controller:** IOS App
- **Power Source:** Lithium-ion Battery

#### Conclusion

The goal of this project is to automate and simplify the pole health inspection process. This will improve safety and reliability, reduce the amount of resources needed to inspect the poles, and increase inspection efficiency. The team will be working with mechanical engineers to build and design the climbing robot with health sensing capabilities. At this point in time, the preliminary detailed design has been completed and the team has completed their schedule for the spring semester.

#### **Future Work**

The development of the initial prototype will begin in January. The initial prototype will then be tested and revised throughout the spring semester to ensure that the final prototype meets all customer needs and requirements.

If the needs and requirements are met ahead of schedule, the team plans on trying to automate other steps in the 18-step inspection process and to continue improving the final prototype.