DUKE ENERGY®

Line Pole Lean Detection Device

NC STATE UNIVERSITY

Sponsor: Aleksandar Vukojevic

Mentor: Bobby Compton

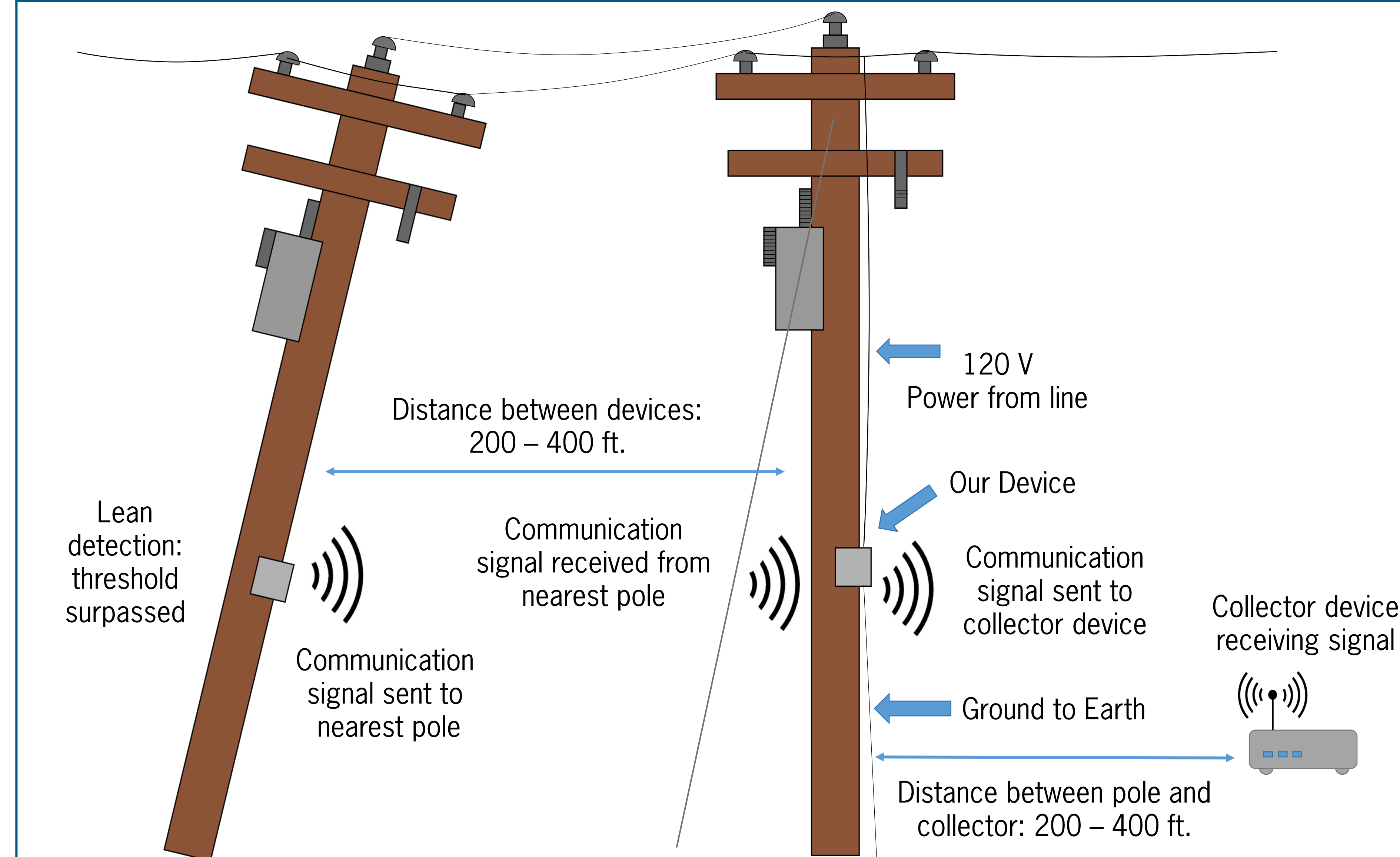**Team**: Abdulrahman Alayed, Ben Newman, Corrine Enriquez, Drish Hansrrajani, & Jaysen Zaleski

Problem Statement

Design and build a low cost tilt sensor to detect the leaning angle of a utility pole and the time it occurred.

Product Requirements

- Detect angle to nearest degree
- Angle metrics transmission distance of 200 – 400 ft.
- 900 MHz Wireless Network
- Withstand harsh weather conditions
- "Last gasp" capacitor
- Run off of 120V power supply from line

System Overview

Distance between devices: 200 – 400 ft.

120 V Power from line

Our Device

Lean detection: threshold surpassed

Communication signal received from nearest pole

Communication signal sent to collector device

Communication signal sent to nearest pole

Collector device receiving signal

Ground to Earth

Distance between pole and collector: 200 – 400 ft.

System Architecture

120 VAC   GND

USB Keyboard & Mouse

5VDC (2/C 20 AWG)

Last Gasp Circuit

20 AWG Jumpers

Micro USB (Male) to USB(A) Hub

USB(A) (Male) to Mini USB (Male)

Solderless Connection

SCL
SDA
GND
VIN (2.5–5.5V)
VDD
SA0

SD Card for Software Storage

Y Z
X

Our Device

Sensor #1

Milestones

- SQL Database for collector
- User friendly GUI to set lean angle
- 900 MHz Mesh Network
- Data hopping
- "Last gasp" circuit
- Emergency Mode