

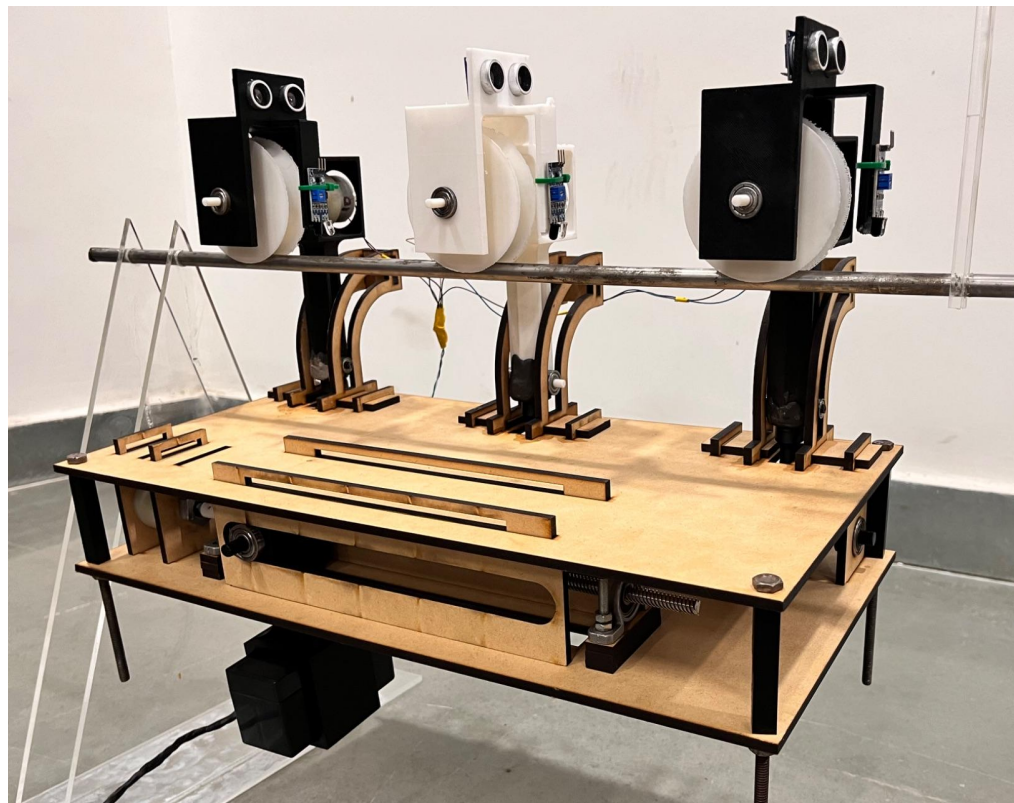
WireBot: The Autonomous High-Voltage Line Inspector

Problem Statement

Manual inspection of high-voltage power lines is **risky** and **inefficient, especially at junctions.**



Solution

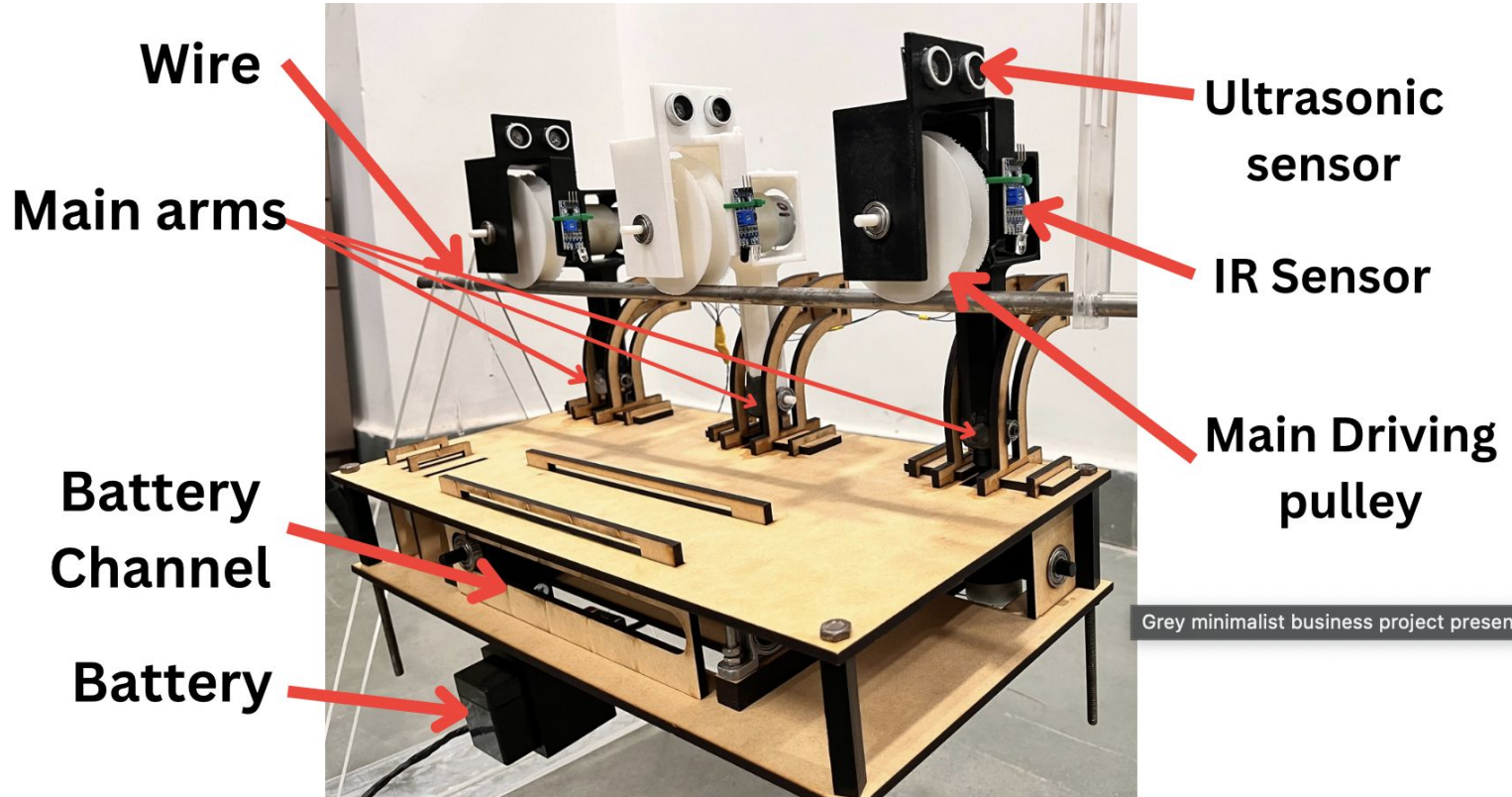


Inspiration



Source-<https://www.youtube.com/watch?v=pwglOID7e0M>

Design



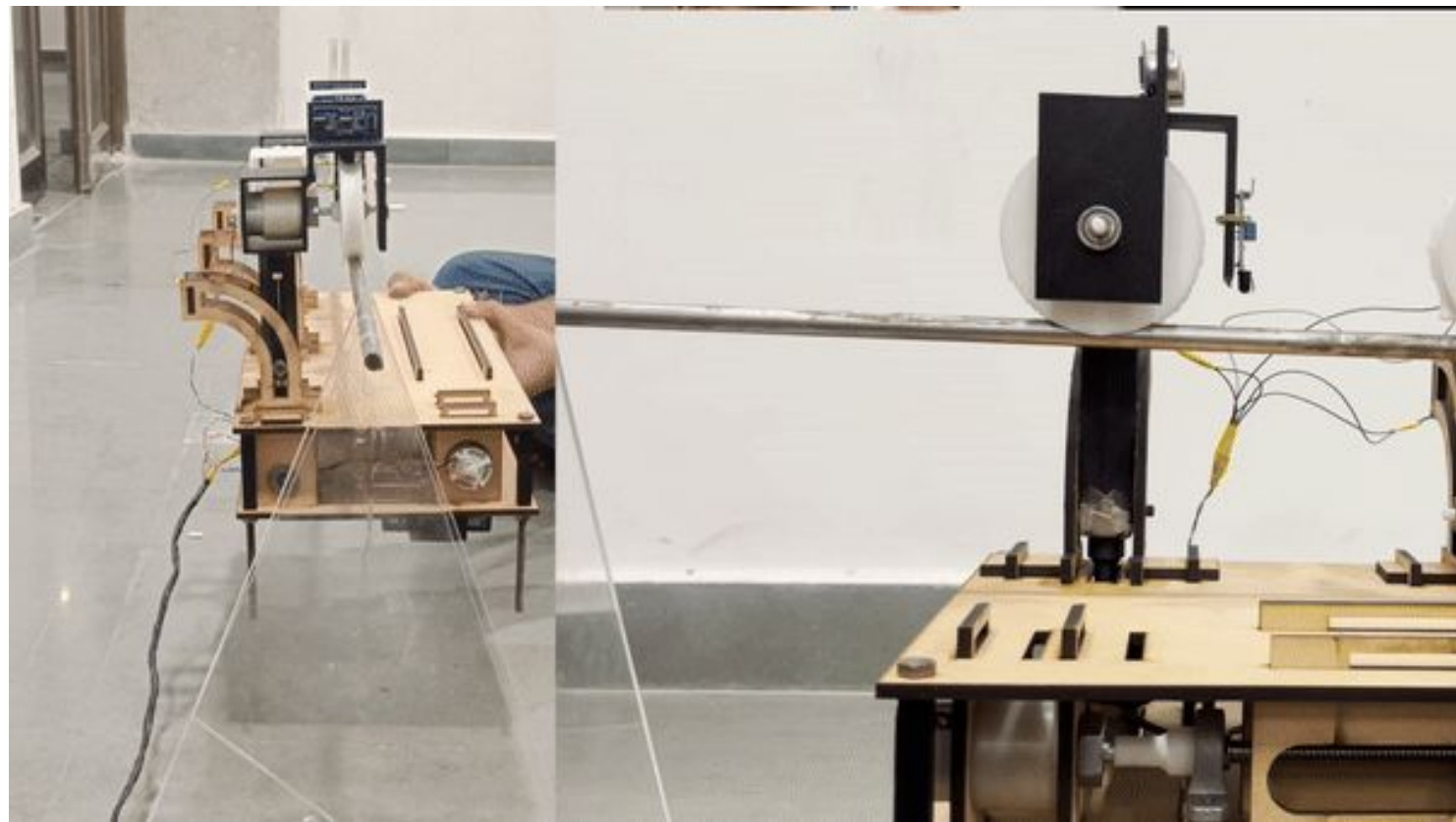
Mechanism-1 ARM Movement



Sliding channel

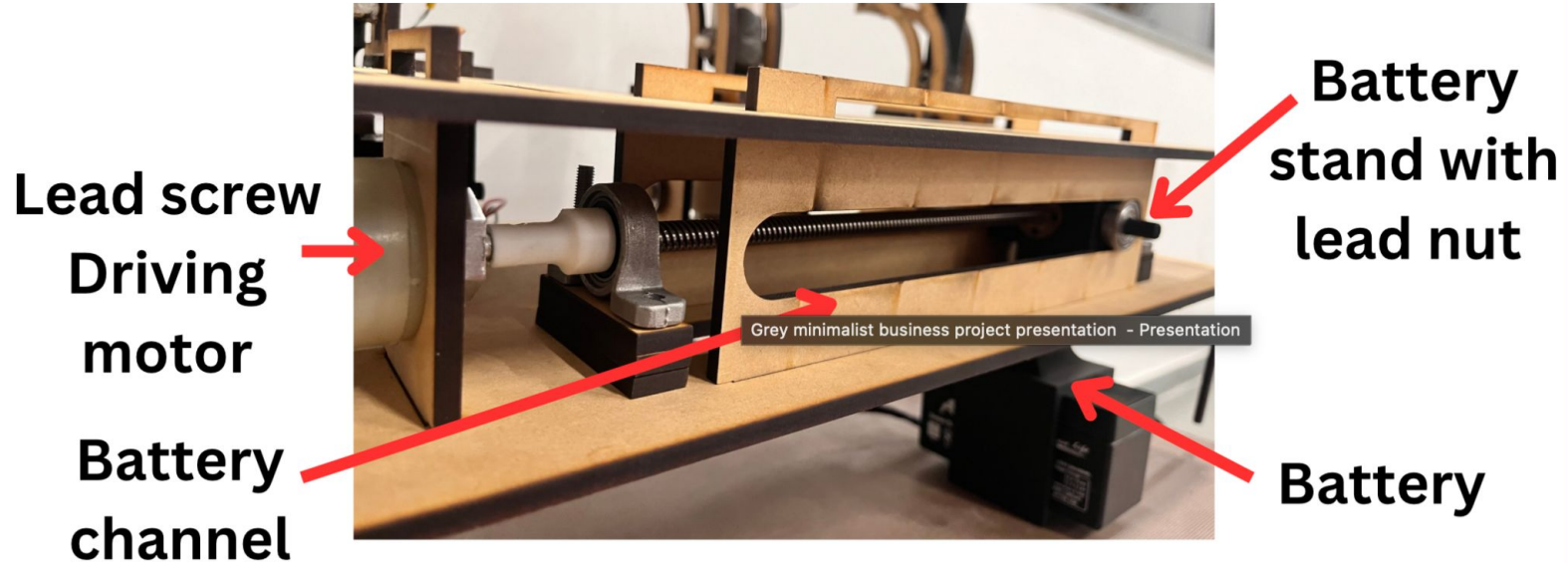
**Main arm with lead nut
attached**

**lead screw driving motor,
mouned on chassie with
swing motion**

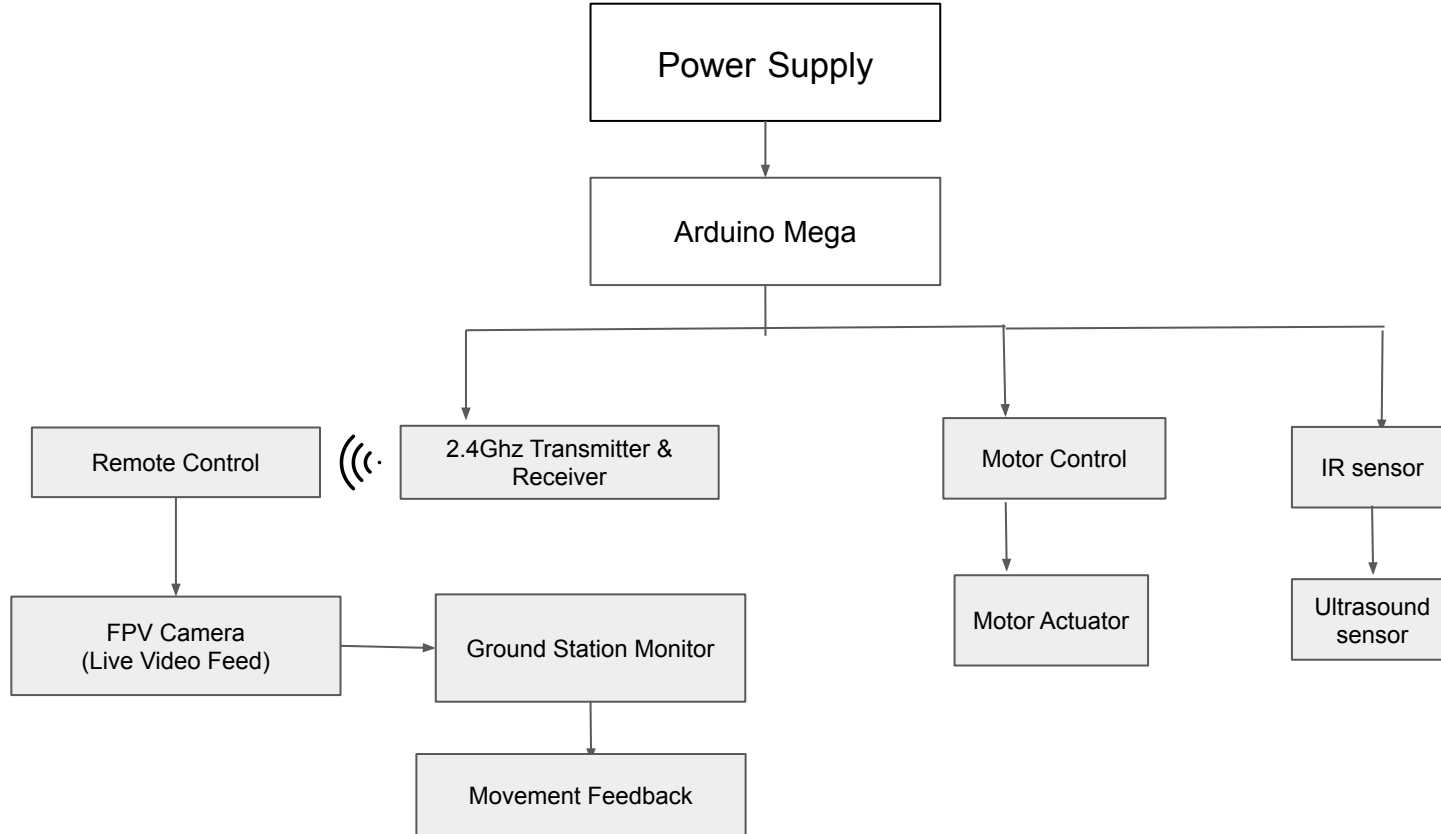


Speed-8x

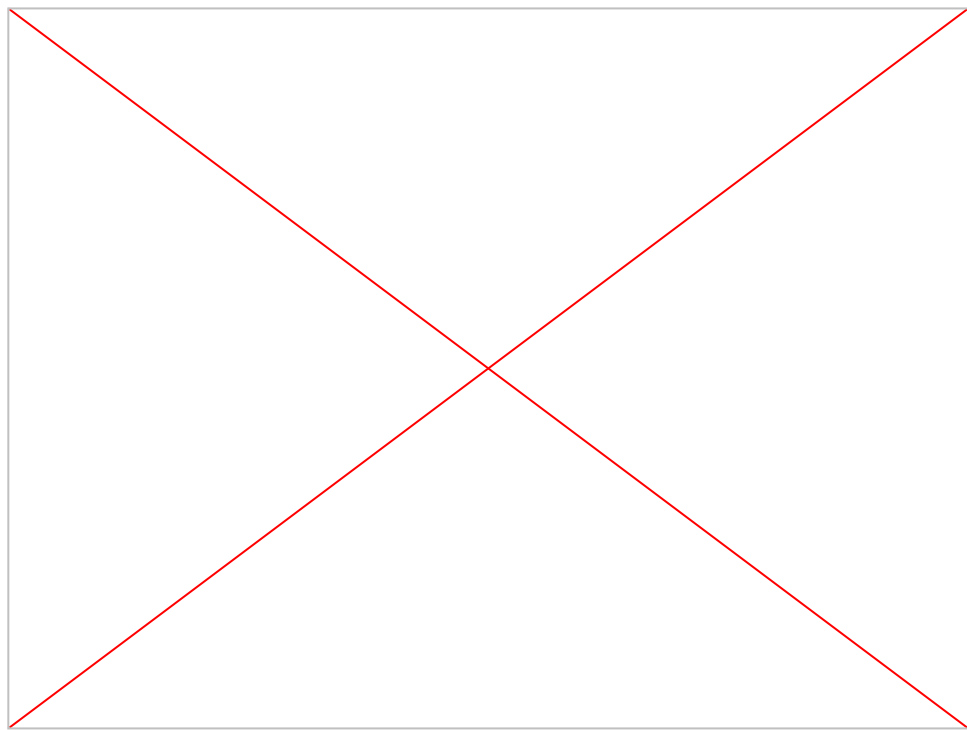
Mechanism-2 Weight balance



MECHATRONIC ARCHITECTURE

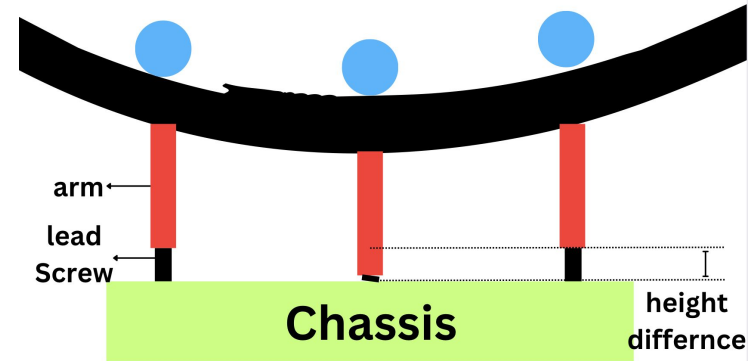


Demonstration



Future Development

- File a **patent** for the robot.
- Put counter weights for the tilt
- **Automate** operations and fine-tune for smoother traversal.
- Develop **Y-axis** balancing during arm movements.
- Enable individual arm height adjustments for **uneven wire alignment**.



Conclusion

- Innovative Solution
- Versatility
- Future Ready
- Impact

“A step forward in minimizing human effort and maximizing safety!”

~team WireBot

Pseudo code

Main Algorithm:

1. **Start the robot**
 - Initialize motors, sensors, and control variables.
2. **Wire Detection:**
 - Read IR sensors to ensure the robot is on the wire.
 - If no wire is detected, stop the robot and re-adjust.
3. **Junction Detection:**
 - Use ultrasonic sensors to detect an upcoming junction.
4. **Crossing the Junction:**
 - Stop the main driving motor.
 - Shift weight to maintain balance across arms.
 - Disengage the arm crossing the junction.
 - Move forward using other arms.
 - Re-engage the arm once it passes the junction.
5. **Uneven Wire Handling (Future Development):**
 - Adjust individual arm heights using motors.
 - Use IR sensor feedback to achieve horizontal alignment.
6. **End the process**

Challenges & Solution