

PowerLine Drone



Site

The Problem

Critical Infrastructures at risk

\$25B

Annual power outage costs

150+

Worker fatalities/year in electrical maintenance

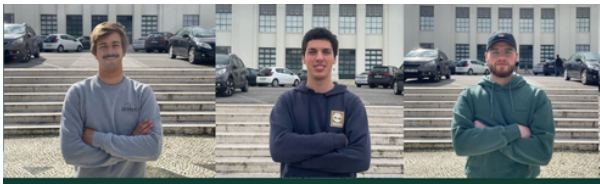
Current Challenges:

- ✗ Manual inspections dangerous
- ✗ Drones need pilot control
- ✗ Inconsistent data collection
- ✗ High operational costs



Disaster due to lack of awareness of the distance from power lines

The Team

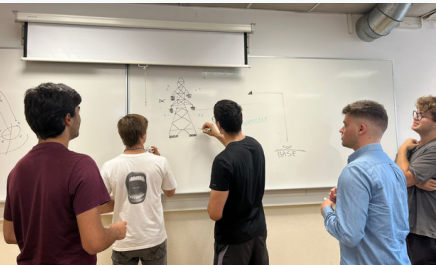


Ricardo Nobre João Henriques Miguel Baia



Henriques Martins Luís Almeida António Alves

The Process



Research

Problem analysis & requirements gathering. Show team collaboration and planning.



Design

Algorithm development & integration. Show coding, software development work.



Testing

Validation & optimization. Show hands-on testing with drone hardware.



Deploy

Real-world implementation. Show field testing or EDP partnership.

Key Innovation

Integration of computer vision, autonomous navigation algorithms, and anomaly detection sensors into existing drone hardware.

The Final Product

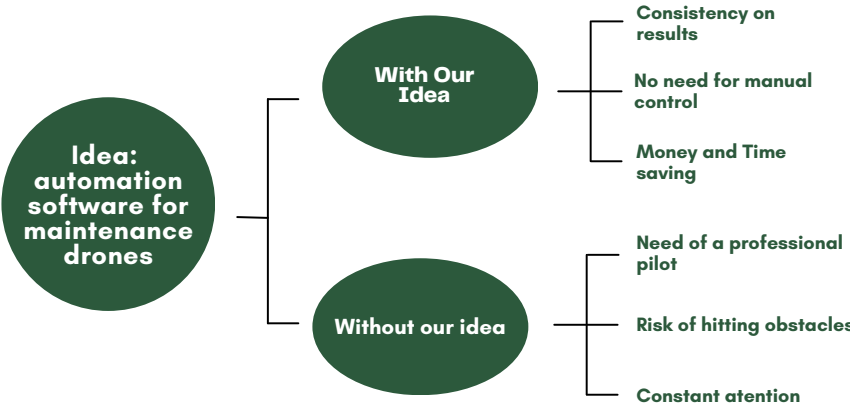


Autonomous flight management with real-time GPS tracking, battery monitoring, and mission progress visualization.



4K real-time streaming from drone cameras with GPS coordinates and instant image capture capabilities.

Automated reporting with captured images, GPS-tagged anomalies, and instant delivery to maintenance teams.



Success Metrics



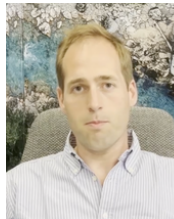
Good visualization of the components, no objects obstructing



Bad visualization, blurriness, objects obstructing view

“O desempenho do grupo foi muito positivo, trabalhou bastante bem, na componente técnica, sem dúvida, mesmo na componente de organização. Estruturaram bem o trabalho, dividiram tarefas e acho que o resultado final do grupo não podia ter sido melhor”

André Coelho, Engenheiro Eletrotécnico, Responsável pelo Departamento de Inspeção de Ativos



ElectroCap Team

Scientific Advisors: André Coelho & Rui Martins (EDP) | Coordinators: Luis Caldas de Oliveira & Rita Cunha | Partners: EDP Labelec



ElectroDay 2025