The future of analytics - artificial intelligence in drone inspections

pwc

The future of analytics lies in artificial intelligence which we proved in our pilot project in California

Description of the project

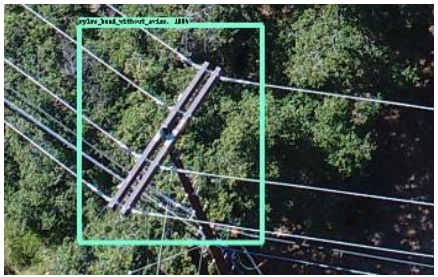
- Client: California's leading power and utilities company
- Technologies used: drones, machine learning, advanced image data analytics

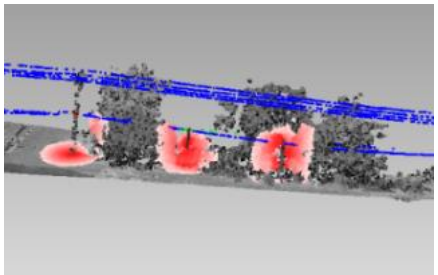
Challenges

Client faced several challenges:

- **Reduce power outages and operational issues** related to vegetation management (proximity of vegetation to wires)
- **Increase effectiveness of asset management** (in particular allocation of infrastructure elements along the power grid)

Up to then, **no suitable technological solutions identified** by the Client



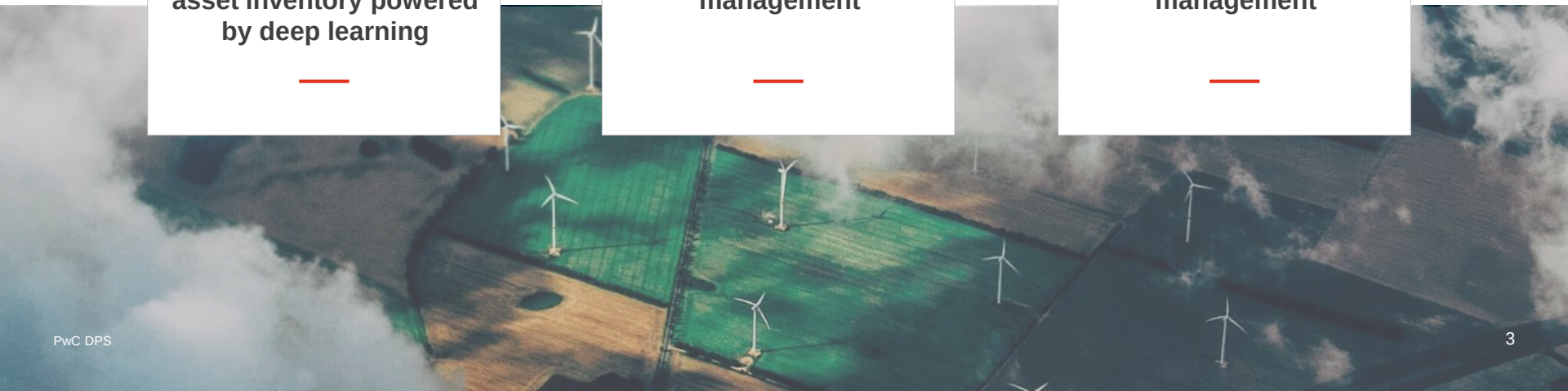


Selected UAV use cases tested during the project are key to effective operations

Automated asset inventory powered by deep learning

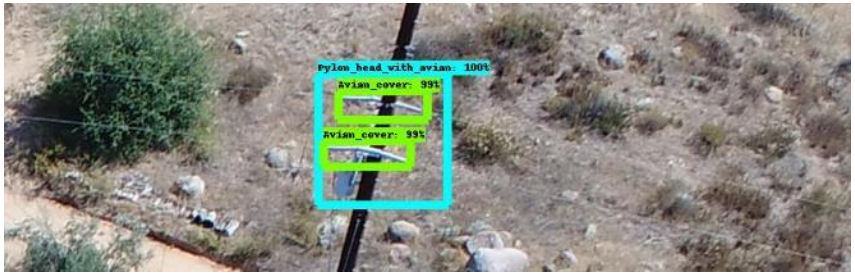
Asset management

Vegetation management



We taught the algorithm to automatically detect infrastructure elements with deep learning technology

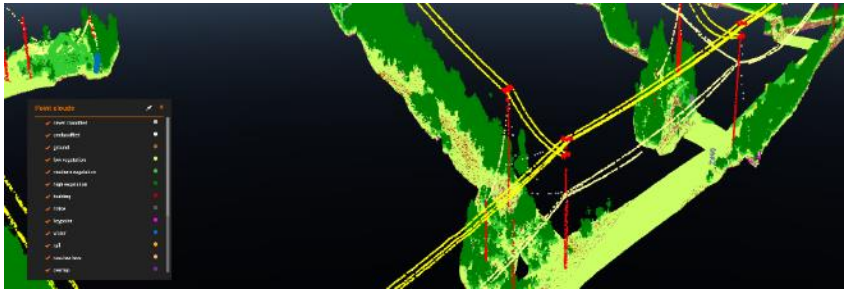
Examples of detected avian cover



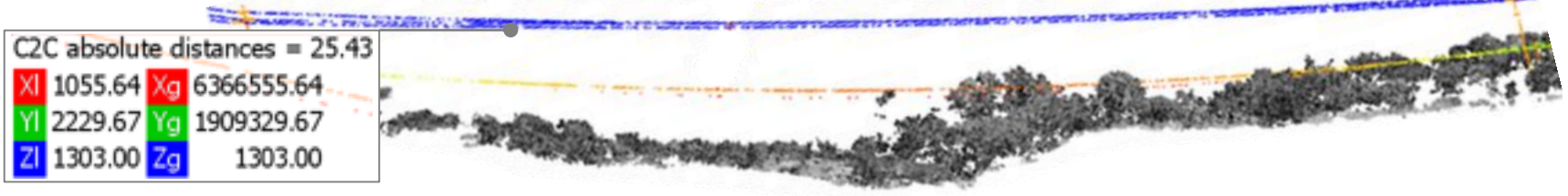
Then, based on aerial data, we created a detailed digital twin which enabled various automated analysis like measuring wires' and pylons' distance to other objects

Measuring position of a distribution pole relative to the ground

Classified LiDAR point cloud representing company power lines implemented inside PwC Geospatial. App

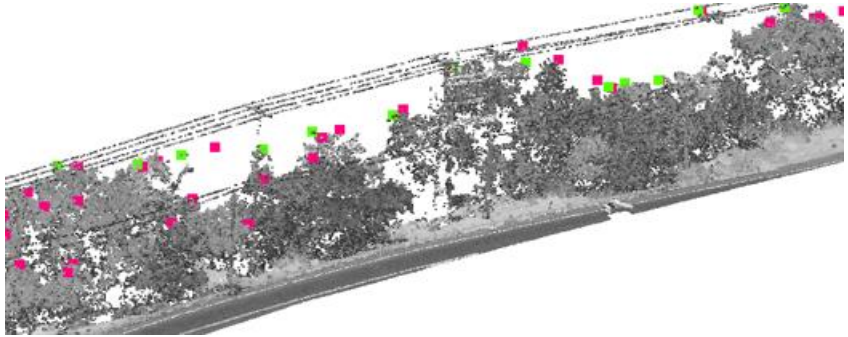


Automatic calculation of the distance between company 2nd level and 3rd level wires and third party wires

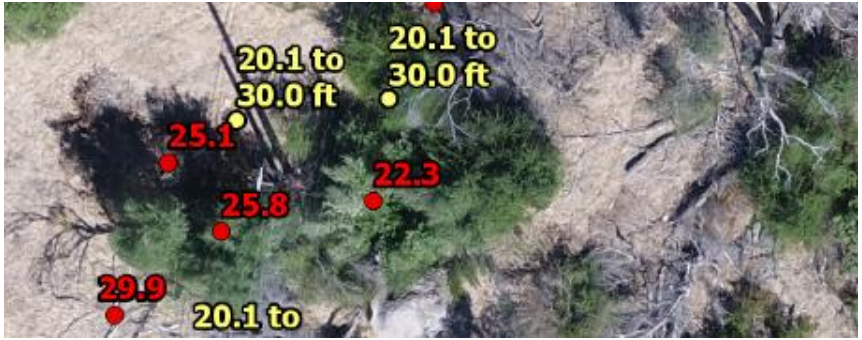


Finally, we used the precise aerial data to 3D model vegetation along the power lines

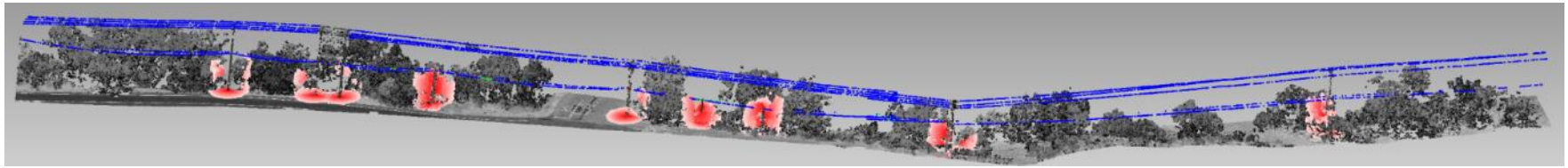
Tree detection conducted by two different algorithms



Measurement of height of trees



Dangerous vegetation detection in LiDAR Point Cloud



Our pilot project resulted in tangible benefits for the energy grid operator

Process	Application	Benefits
Automated asset inventory	• **Digital cataloging** • Quantity, location, and quality of inventoried assets	• Inventory management through **shared access** • Data available to facilitate **effective decision making** • Digital portfolio to make crisis decisions
Asset management	• **Condition assessments** of power & utility infrastructure with drones	• **Workers' safety** • **Decreased inspection** costs and "greener" process • **Interactive 3D models**
Vegetation management	• Using LiDAR technology and photogrammetry for **vegetation mapping and analysis**	• Strategic and data-driven level of **work forecasting** • Tactical **vegetation work planning**

For more information….

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