LANDPRO
Make the most of your land

LiDAR and Spectral Reflectance for Advanced Vegetation Monitoring

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Company & Speaker Background

Surveying

Aerial Survey & Mapping

Environmental & Technical

Planning & Resource Management

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Presentation Overview

- Remote Sensing Basics
- What is LiDAR
- LiDAR Vegetation Metrics
- Multi and Hyperspectral imagery
- Vegetation Analytics
- Bringing the data together for meaningful analytics
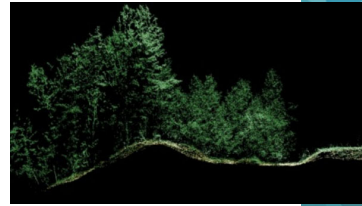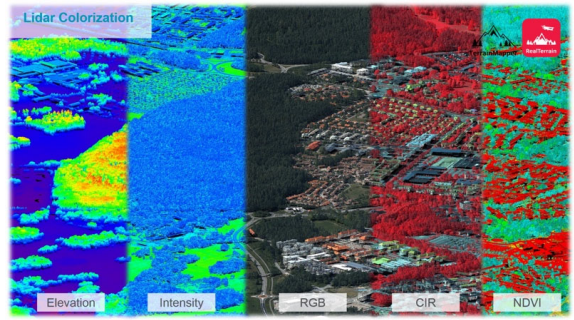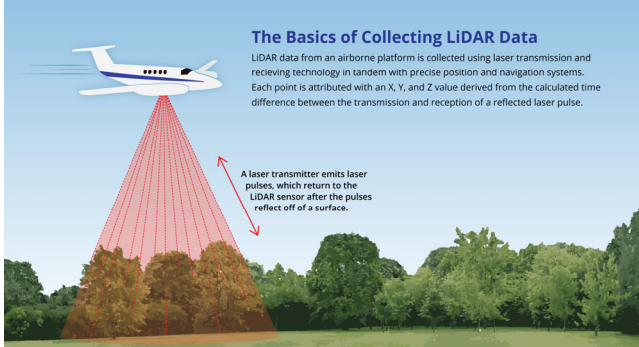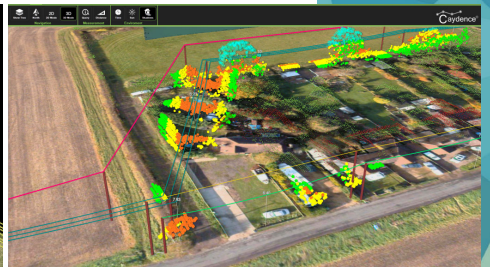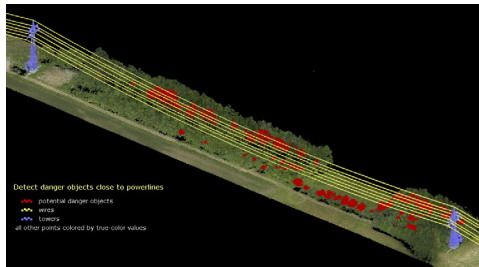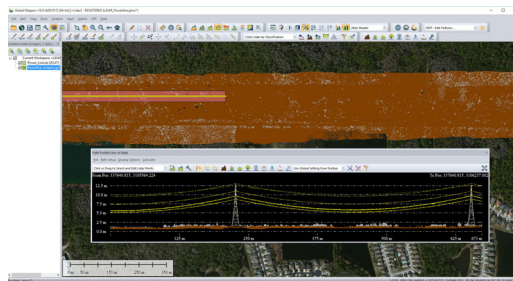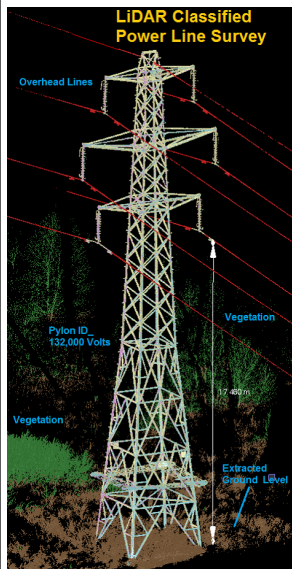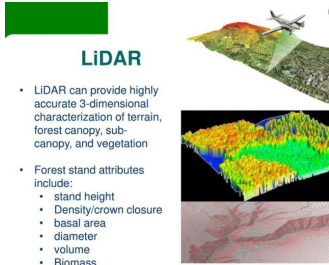- Questions and Discussions

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What is LiDAR

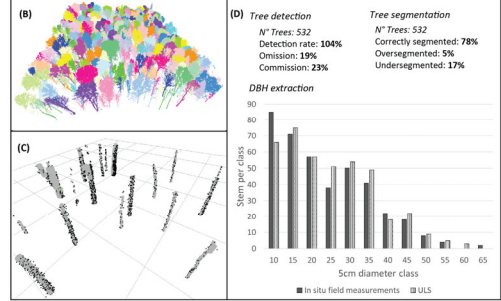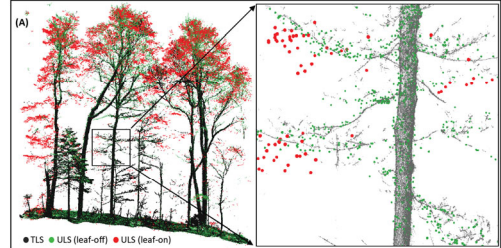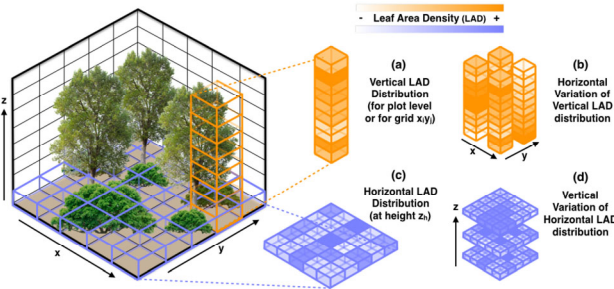neon

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Active LiDAR Sensors

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Typical LiDAR for Powerline Industry

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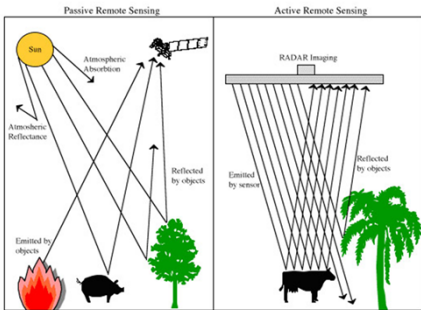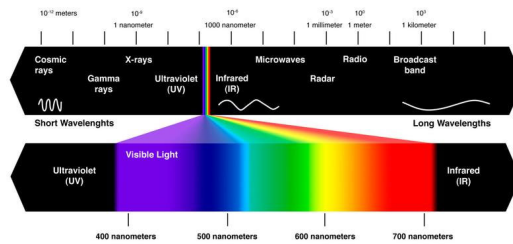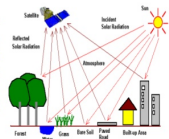# LiDAR Vegetation Metrics
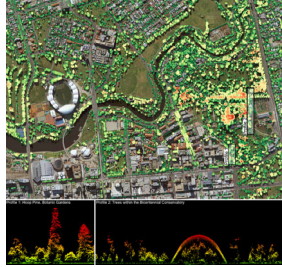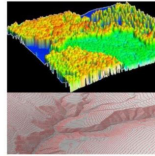
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So what is remote sensing?
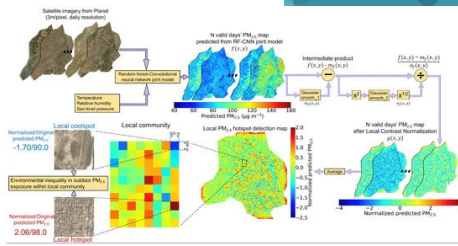

INTRODUCTION TO REMOTE SENSING

Definition:

Remote sensing is an art and science of obtaining information about an object or feature without physically coming in contact with that object or feature

Active sensors emit energy in order to scan objects and areas whereupon a sensor then detects and measures the radiation that is reflected or backscattered from the target. RADAR and LiDAR are examples of active remote sensing where the time delay between emission and return is measured, establishing the location, speed and direction of an object.

Passive sensors gather radiation that is emitted or reflected by the object or surrounding areas. Reflected sunlight is the most common source of radiation measured by passive sensors. Examples of passive remote sensors include film photography, infrared, charge-coupled devices, and radiometers.

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Multispectral and Hyperspectral Imaging Sensors

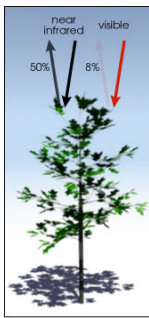

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Normalized difference vegetation index

$$NDVI = \frac{(NIR - Red)}{(NIR + Red)}$$

NDVI always ranges from -1 to +1.

-1 – 0	0 – 0.33	0.33 – 0.66	0.66 – 1
Dead Plant or Inanimate Object	Unhealthy Plant	Moderately Healthy Plant	Very Healthy Plant

Normalized Difference Vegetation Index (NDVI) quantifies vegetation by measuring the difference between near-infrared (which vegetation strongly reflects) and red light (which vegetation absorbs).
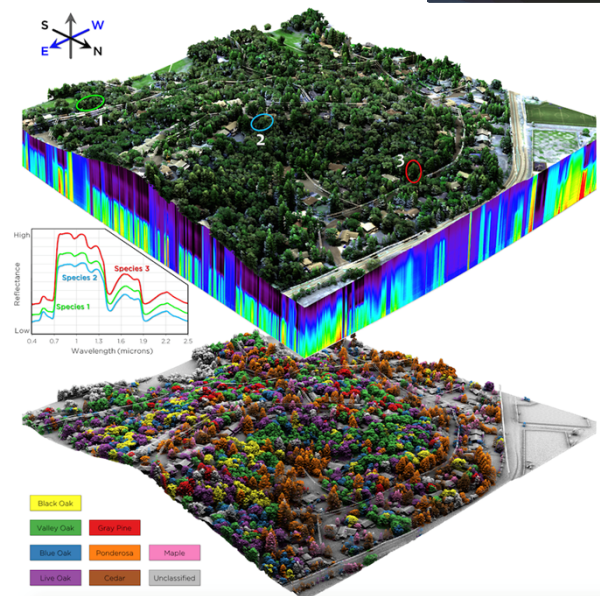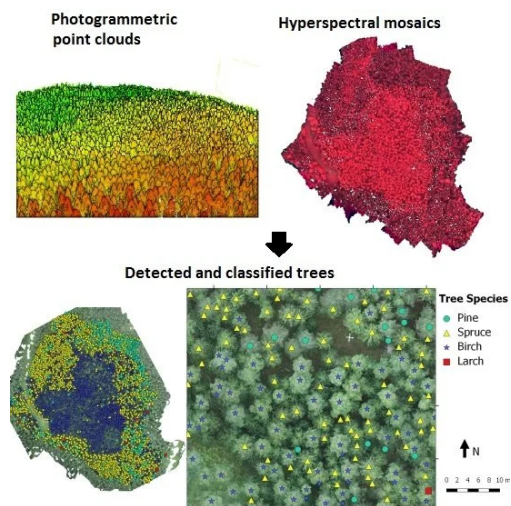
$$\frac{(0.50 - 0.08)}{(0.50 + 0.08)} = 0.72 \qquad \frac{(0.4 - 0.30)}{(0.4 + 0.30)} = 0.14$$

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NDVI Examples from Multispectral
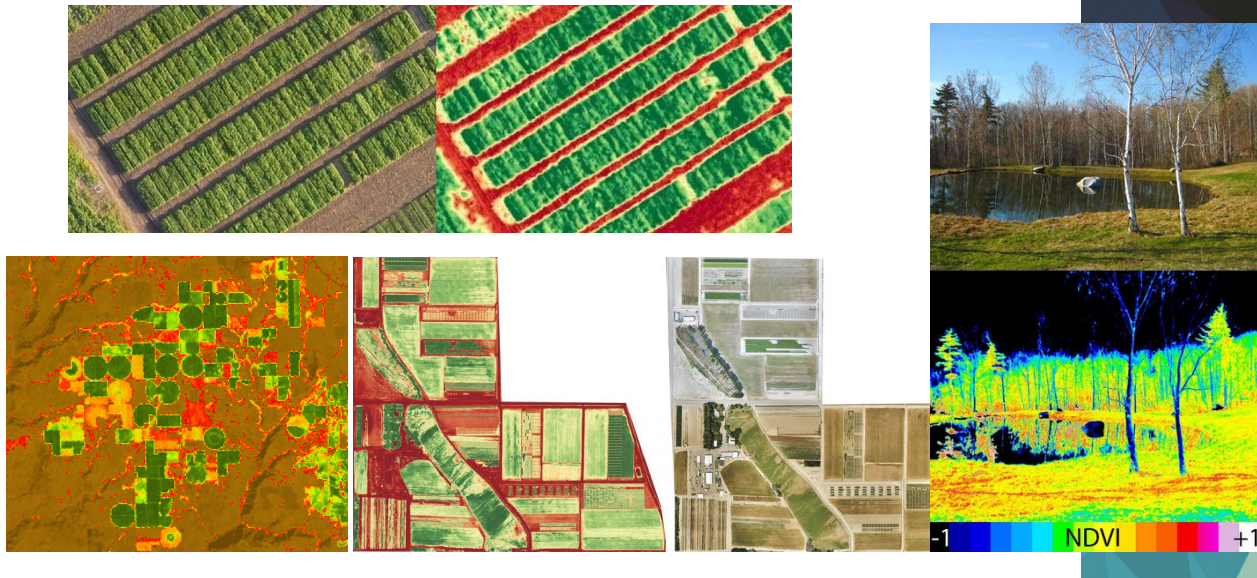
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Species Analysis from Hyperspectral

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Growth and AI predictions

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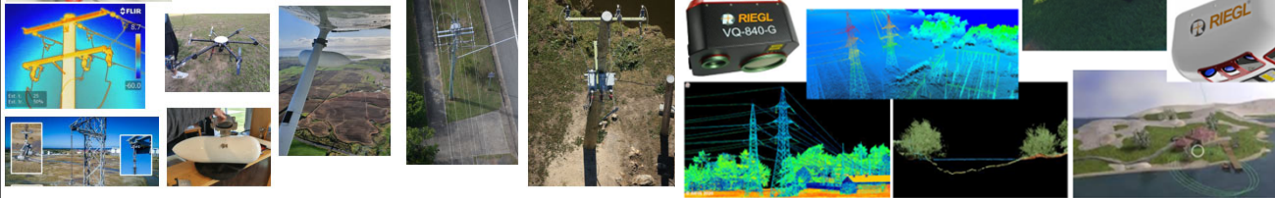# Bringing it back to your networks

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Landpro Powerline Systems

Landpro VUX 840G LiDAR sensor

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Questions and Discussion

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