Multi-source Remote Sensing Data for Modelling Tree Risk on Utility Infrastructure and Leveraging Climate Adapted Vegetation Management

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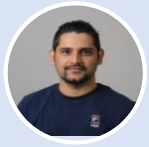

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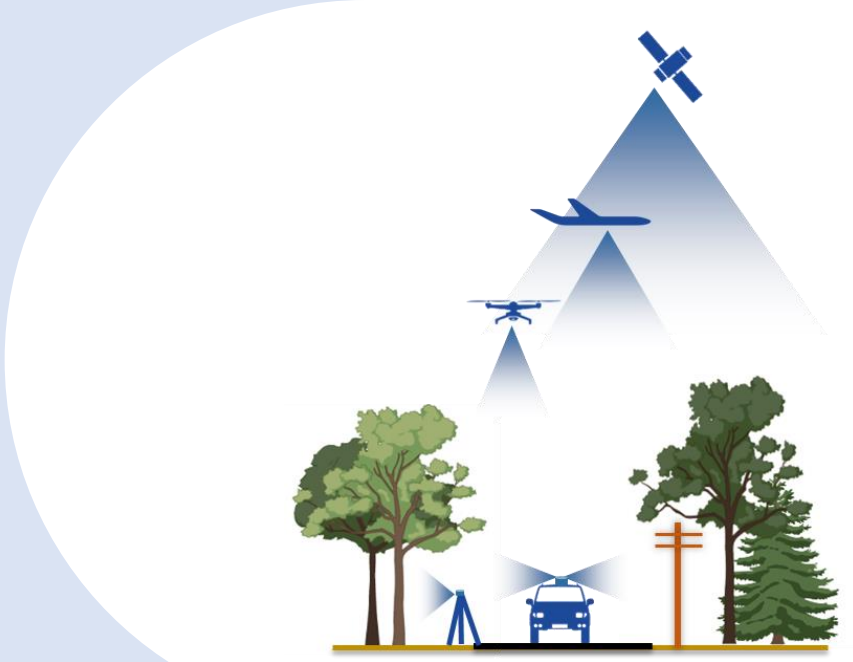

Industry Relevance & Need

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Characterization of roadside vegetation can assist utility industry to effectively allocate resources to implement vegetation management programs – tree trimming and removal operations, when & where needed basis.

The key **challenge** confronted in vegetation risk modelling is to obtain **tree structure and health** information over a **large area** - across different granularities from pole span, isolation device exposure zone, to circuit level - without compromising spatial details.

Project Goals and Objectives

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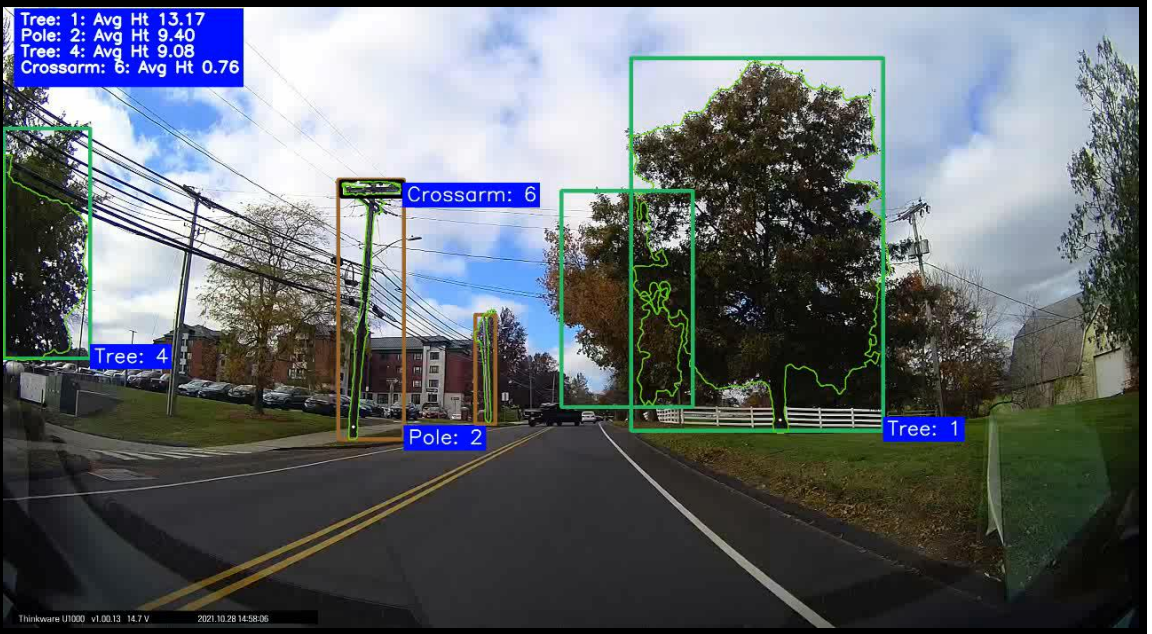
Goal

To combine **multi-modal** remote sensing observations to monitor and assess roadside **tree structure** and **health** condition and to develop **spatially explicit** models to predict tree failure risk.

Objectives

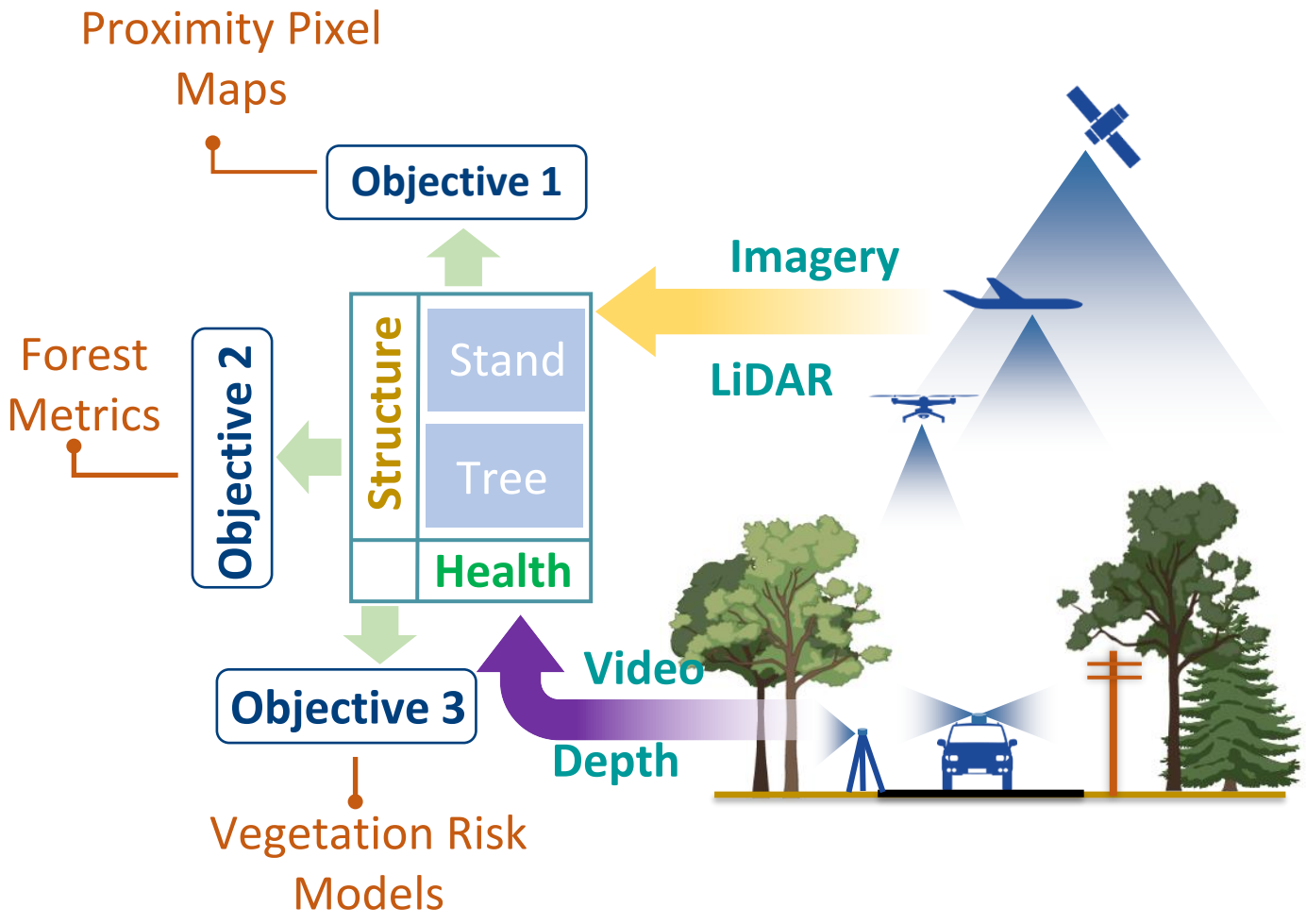
1. Develop a new statewide **proximity pixel map** (version 2.0) based on the 2023 LiDAR data to improve the outage prediction modelling
2. Derive LiDAR-based **forest metrics** that explain tree structural characteristics and relate to tree biomechanics modelling
3. Combine **mobile** and **overhead** remote sensing to inform vegetation risk modelling and optimal targeting of vegetation management programs

Research Approach



Vehicle-based Tree Assays

Remote Sensing of Forest-Infrastructure System



Outcomes and Deliverables

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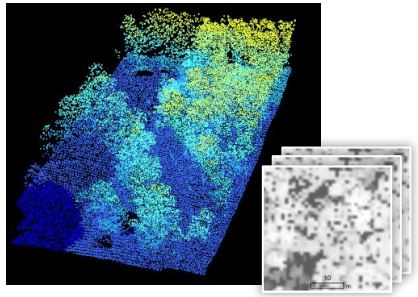

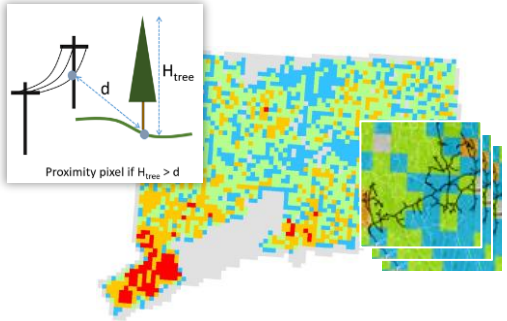

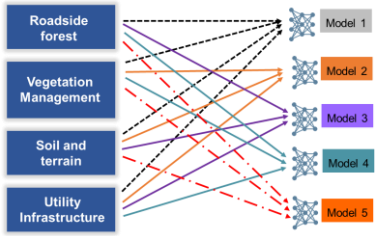

- Tree canopy height models
- LiDAR-based forest metrics
- New version of proximity pixel maps
- ML/AI models to integrate vehicle-based and overhead remote sensing data
- Improved vegetation risk models at multiple spatial scales

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Research Impact

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Research outcomes will generate new **knowledge** and **tools** to leverage climate adapted vegetation management for;

- maximizing grid resilience
- optimizing management investment on roadside forest
- sustaining ecosystem benefits

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