Forest SAT 2026

Association for Forest Spatial Analysis Technologies

May 4-8, 2026 | Gainesville, Florida, USA

Title: Dive into TreeAIBox: An Open-Source AI-Driven CloudCompare Plugin for Interactive 3D Forest LiDAR Analysis

Instructors/Affiliation:

- Charumitha Selvaraj, Canadian Forest Service
- Dani Degenhardt, Natural Resources Canada

Description: With the rapid expansion of terrestrial and UAV LiDAR datasets, there's a growing need for intuitive, automated tools that deliver a true "click-and-go" experience for individual-tree analysis. Yet, despite the promise of AI, few product-ready solutions integrate deep learning into 3D forest workflows. This hands-on workshop fills that gap by showing a deep learning–powered plugin, TreeAIBox, in the open-source 3D editing tool CloudCompare. It unifies core LiDAR-processing workflows including a deep-learning filter to separate understory and overstory points, an end-to-end crown-segmentation pipeline with manual-editing support, and 3D stem & branch classifier and modeler. It enables forestry practitioners and researchers to interactively process 3D LiDAR data rapidly and accurately.

Learning Objectives: Audience work through a complete pipeline, loading and preprocessing terrestrial, UAV, and airborne LiDAR scans of forests, then achieving precise individual-tree delineation. The outputs will be ready for advanced tree-level analysis, multi-scale calibration, or as reference data for training new AI models.

Target audience: Forestry practitioners, researchers, and professionals working with terrestrial or UAV LiDAR datasets who are interested in applying deep learning to 3D forest data analysis. Also suitable for those looking for hands-on experience with automated tools for individual-tree analysis.

Format & Activities: The workshop is a hands-on session using the open-source 3D editing tool CloudCompare with the TreeAIBox plugin. Participants will apply a deep-learning filter to separate understory and overstory points, perform end-to-end crown

segmentation with manual editing support, and classify and model 3D stems and branches. All activities are guided, allowing attendees to process and analyze 3D LiDAR datasets in real time.

Expected outcomes:

- Familiarity with TreeAIBox and its deep learning–powered tools for LiDAR processing
- Ability to separate understory and overstory points and perform crown segmentation
- Skills to classify and model 3D stems and branches accurately
- Improved efficiency and accuracy in individual-tree analysis using automated 3D workflows

Language: English

Requirements: This workshop welcomes anyone with foundational deep learning knowledge and some 3D data experience. Both professionals and enthusiasts can participate. Specialized expertise in remote sensing, GIS, or ecology is not necessary. Prerequisites for participants: 1. Install most recent CloudCompare alpha version (available at https://cloudcompare-org.danielgm.net/release/) 2. Basic comfort navigating point clouds in CloudCompare 3. Windows laptop with Wi-Fi access (NVIDIA GPU with CUDA drivers preferred) 4. Administrative privileges on your computer.

Schedule: February 13, 2026, 9:00 AM – 2:00 PM (EST)

Duration: 4 hours.

Instructor Biography: Charumitha Selvaraj is a 4th year Geomatics Engineering student at the University of Calgary. She worked on the development of TreeAIbox under Drs. Zhouxin Xi and Dani Degenhardt. Dr. Dani Degenhardt is a research scientist with Natural Resources Canada. She is also an adjunct professor in the Department of Renewable Resources at the University of Alberta. Currently she is leading a team of multi-disciplinary researchers to develop reclamation techniques and technologies to accelerate the creation of sustainable forest ecosystems post-industrial disturbances.

Agenda

Eastern Time (ET)	Topic	Instructor
9:00 – 10:00	A concise introduction to TreeAIBox, its capabilities, and an outline of the day's workflow.	Charumitha Selvaraj, Dani Degenhardt
10:00 – 11:00	Hands-On Exercises	Charumitha Selvaraj, Dani Degenhardt
11:00 – 12:00	**Break**	
12:00 – 14:00	Hands-On Exercises	Charumitha Selvaraj, Dani Degenhardt