Transforming Vegetation PointClouds into Predictive Analytics for L-System Parameters

Gunner Stone, University of Nevada, Reno

Dr. Alireza Tavakkoli

Cyberinfrastructure Innovations (CII)

Abstract:
With the urgency to understand and mitigate forest fire impacts escalating, this research introduces a novel approach for analyzing tree structures through point cloud data. Our objective is to translate dense tree point clouds into mathematical models known as L-System parameters, thereby capturing the complex growth patterns of trees. At the heart of this project is the development of a deep learning model, designed to predict L-System parameters from unstructured tree point cloud data. Utilizing synthetic data where ground truth parameters are precisely known, a regression model can be trained, setting a foundation for extensive structural analysis. This approach has the potential to revolutionize how we assess fire damage and improve our strategies for managing wildfires. By thoroughly examining how tree properties and forest fire behavior interact, we aim to make meaningful advances in the realms of environmental conservation and wildfire prevention.