

Title:

**DENDrone : The Digital Ecology Nevada Drone  
A UAS for autonomous mapping of sagebrush landscapes**

Team:

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Abstract:

Northern Nevada has suffered one of its most difficult periods over the last decade, due to uncontrolled wildfires. A significant challenge in planning for & preventing/suppressing such phenomena comes from the composition of its landscapes by wide sagebrush ecosystems. Volumetric mapping of these at the centimeter-level, and characterization with respect to fire fuel content which depends on the species of otherwise macroscopically indistinguishable shrubs, is a task that requires both efficient large-scale & high-fidelity 3D reconstruction, as well as close-up imaging for capturing of the foliage fine-detail microstructure (e.g. shape of leaves) to identify specific sagebrush species. We propose a UAS-based system equipped with the necessary modalities, as well as a Deep-Learned Semantic Segmentation framework to systematically achieve these goals.