

**Title of Project:** Development of an Automated System for Image/Video Evaluation of Tree Overhang on Wiring (*Proposed to NIPSCO 2017-18*)

**Project Director:** Lauren Christopher (PI), Paul Salama

**Area:** 3D Camera, Machine Learning

**Brief Description:** In order to measure the need for vegetation trimming around power and utility lines, an automatic, fast, and effective measurement of their relative 3D positions is needed. The goal of this research is in the first year: 1) to develop a 3D (depth) estimation algorithm accurate enough on limited data set (100's of examples) for assessing trimming needs 2) purchase and design a prototype video camera with 3D capability tuned to this problem; then in the second year: 3) use video camera to collect large amount of data (10,000's of data) and 4) test and compare the system effectiveness of a ground based system, with the potential of a flight-based system. For the future, a small size imager and lens assembly is needed for many applications, and this is especially true for quadcopter systems which need small, light electronics to fly. Currently it is a difficult fit for the current 3D cameras: they require two imagers for left and right views. This research uses machine learning (Deep Learning) and extends depth from motion, depth from disparity, and Depth from Defocus (DfD) and other computational vision cues to provide a fast estimate of the relative depth and need for vegetation trimming.



Power Line Corridor, UAV view

**Link:** TBD