Name/Contact of Project: Stanley Pau

Project Name: Color Polarization Imaging

Project Description:

Polarization is a property of light wherein rays of light have different amplitudes in different directions. Our eyes can differentiate colors coming from an object but we cannot distinguish the different directions of polarization. Photographers often use polarizer in front of a camera to reduce glare and to improve contrast, but modern digital camera is polarization blind. Conventional color camera uses small color filters, such as red, green and blue color filters, to measure color information at different pixel. In order to image the polarization state of light, a polarization camera can use small polarizer filter with dimension equal to the size of the pixel. This research project involves the application of a division-of-focal plane color polarization camera, a camera developed at the University of Arizona, to measure polarization image and video of natural scenes around the Tucson area. The tasks are focus on the acquisition, image processing and interpretation of the polarization images, with goal to better understand and document the nature and form of polarization in outdoor environment.

Required Skills:

Knowledge of MATLAB (preferred) or other programming languages for data analysis and presentation, motivation and ability to work with little direct supervision, tenacity and interest to solve difficult scientific and engineering problems, and willingness to work outdoor in hot Arizona summer.

Ideal Skills: Interest in photography and optics, some backgrounds in image processing and polarization, possess a car and a valid driver license