LESA Lighting Enabled Systems & Applications
A National Science Foundation Engineering Research Center

LESA Center Summer URP Opportunity (two students)

Title: *Design and testing of functional point and shoot plant fluorescence tool*

Duration: **Fall 2023**

Global food production is stressed by accelerating environmental change and food demand is increasing due to population growth. Increasingly, advanced sensing systems are being developed to monitor plant health to insure sustainable crop production. One way to monitor plant health and stress is by measuring chlorophyll fluorescence (weak red emission) produced when a plant absorbs light needed for photosynthesis. Such a tool can be a valuable part of the real time monitoring of crop growth in greenhouses and vertical farms. In such controlled environments, plant growth can be optimized by controlling lighting, temperature, humidity and ambient CO_2 levels. Sensors (like fluorescence monitoring) can be an important part of optimizing crop yields and produce quality.

Strawberries being grown in a controlled environment at LESA

LESA is looking to hire two (2) Fall 2023 URP students to complete the development of a compact fluorescence tool that can be used to measure chlorophyll *a* fluorescence in real time. This team will evaluate the performance of the current rough prototype, design, build and test an improved version, focusing building a more compact version that could be used routinely within LESA, and possibly at our collaborators at Cornell University.

The students should have interest and experience in one or more of the following areas:

- Electronics design (PCB layout, LED operation, the use of photodetectors and lock-in amplifiers and microprocessor control)
- Basic optical design
- Basic mechanical design and construction (3D printing) of the system housing
- Wireless communications (most likely BLE, though WiFi is also possible)

Interested students, apply with your **resume & cover letter** to LESA no later than ***Monday September 4, 2023.***

Send your application to:

Bob Karlicek (professor and center director), karlir@rpi.edu or Rick Neal (research engineer), nealr@rpi.edu