

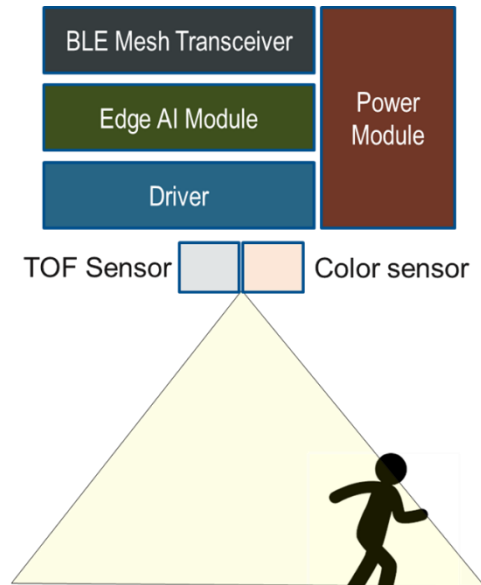
LESA Center Summer URP Opportunity (two students)

Title: *Design and testing of a low cost occupancy sensing system*

Duration: **Fall 2023**

Accurate occupancy sensing is important for minimizing the carbon footprint of buildings and for improving patient healthcare. In the former, accurate human presence detection that preserves privacy and has no false positive/negative detection events can be used for more efficient HVAC system control and operation of smart plug loads and lighting systems in both commercial and residential buildings. In healthcare, patient monitoring and movement can be used to estimate patient health and frailty, an estimator for fall prediction.

Current occupancy technology is largely based on motion sensing, a method that is particularly susceptible to false positive/negative events, or RF sensing which is poor at localizing occupant positions. The use of low cost IR time of flight (TOF) sensors combined with reflected visible light color sensors offer a new approach to monitoring occupancy for both efficient buildings and better patient care.



Low cost sensor fusion concept using time of flight (TOF) and reflected color sensing for occupancy estimation (patent pending)

LESA is looking to hire two (2) Fall 2023 URP students to complete the development of a compact occupancy sensor system. This team will evaluate the performance of the current rough prototype, design, build and test an improved version, focusing on building a more compact version that could be used for testing in our ARP Ae (DOE) funded research program.

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

- Electronics design (PCB layout, microprocessor control and BLE mesh design)
- Basic machine learning concepts
- Basic mechanical design and construction (3D printing) of the system housing
- Wireless communications (BLE)

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