

Guest Lecture

Experimental Results on Smart Trapping and AI Algorithms for Mosquito Surveillance

Sriram Chellappan, Department of Computer Science and Engineering,
University of South Florida, USA

Abstract:

The tiny mosquito is indeed the deadliest animal on earth. Malaria alone kills about 750,000 people each year in Africa (mostly children). Zika created tremendous fear across the globe in 2016. Dengue is now globally spreading as are diseases like Chikungunya and West Nile Fever. Among mosquito vectors, especially efficient ones are *Anopheles stephensi* and *Anopheles gambiae* (both malaria vectors) and *Aedes aegypti* (dengue, Zika and chikungunya vector). Detecting density of vectors in any area is critical for public health. Unfortunately, it is a laborious and manual process today. In this talk, we will elaborate on our recent efforts towards automation of mosquito identification. Briefly, our innovation is a) a novel mosquito trap equipped with infrared, audio and camera sensors that will attract mosquitoes and make them 'stick' on a pad, during which audio and photos will be captured for identification; b) AI algorithms will perform a range of classification problems including what species the trapped specimen is, and the gonotrophic stage of a mosquito; c) adapting the AI algorithms for explainability (via separating anatomical components of a mosquito – head, thorax, wings, abdomen and legs – and highlighting most critical components used in decision making); d) archiving all information in the back-end, while providing a user-friendly dashboard for visualization. Experimental results will also be presented, along with future opportunities for collaboration.