



Thesis Defense

Computer Science Master's Program

“Smartphone Based Object Detection in Shark Spotting”

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Abstract:

Given concern over shark attacks in coastal regions, the recent use of unmanned aerial vehicles (UAVs), or drones, has increased to ensure the safety of beachgoers. However, much of city officials' process remains manual, with drone operation and review of footage still playing a significant role. In pursuit of a more automated solution, researchers have turned to the usage of neural networks to perform detection of sharks and other marine life. For on-device solutions, this has historically required assembling individual hardware components to form an embedded system to utilize the machine learning model. This means that the camera, neural processing unit, and central processing unit are purchased and assembled separately, requiring specific drivers and involving a lengthy setup process. Addressing these issues, we look to the usage of smartphones as a novel integrated solution for shark detection. This paper looks at using an iPhone 14 Pro as the driving force for a YOLOv5 based model, and comparing our results to previous literature in shark-based object detection. We find that our system outperforms previous methods at both higher throughput and increased accuracy.

Date: Thursday, October 26th, 2023

Time: 12:00 PM – 2:00 PM

Location: 14-255

Committee: Dr. Kurfess, Dr. Anderson, Dr. Mukhopadhyay

