An Underwater Behavior Recognition System for Marine Life

Favour Nerrise[1], Seckin Demir[2], Sule Ozev[2], Jennifer Blain Christen[2]

[1] University of Maryland, College Park [2] School of ECEE at Arizona State University

- ❑ **Objective**: Automatically identify sea turtle u-turn & reversal behavior
- ❑ **Solution**: Object Detection CNN (YOLO v4) + extended Kalman filter
- ❑ **Methodology**:
  - ❑ Generated 270 clips of manually identified sea turtle behaviors
  - ❑ Transfer learning of tiny YOLO v4 on Open Images
  - ❑ Retrieved bounding boxes from predictions
  - ❑ Performed distance estimation
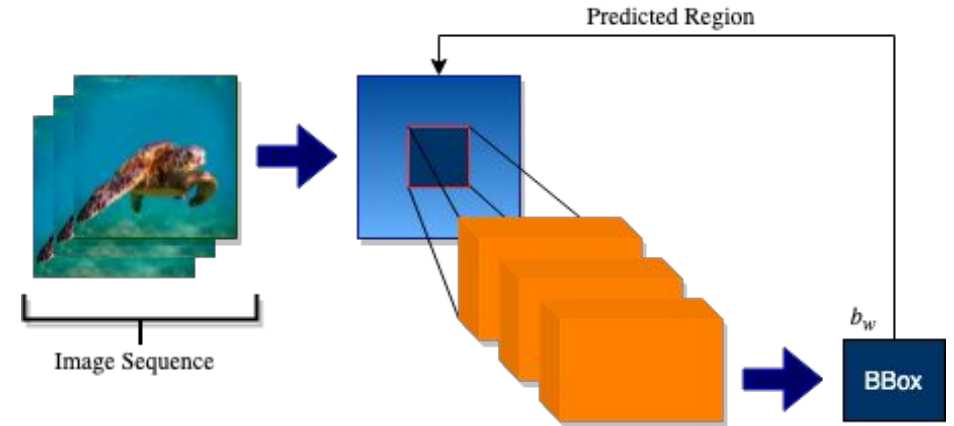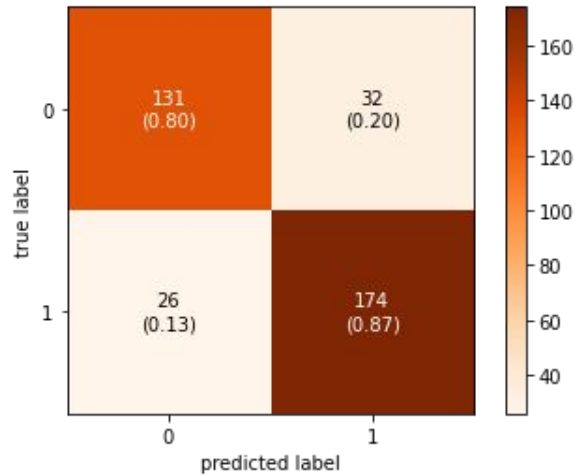- ❑ **Accuracy**: mAP@IoU50 = 85.67%

Fig. 1: Model of object detection + bbox retrieval

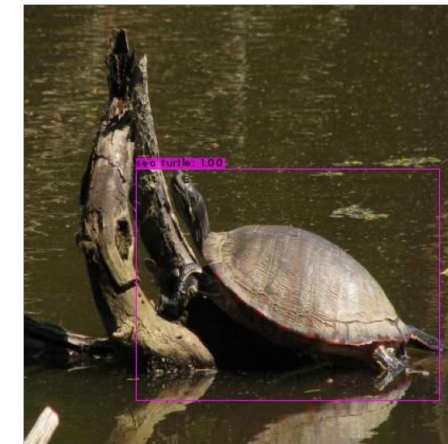| Metric	Score
Precision	0.80
Recall	0.83
F1-score	0.82

Fig. 3 & 4: Evaluation metrics for sea turtle prediction

Fig. 2: Sea turtle prediction

Ira A. Fulton Schools of Engineering
ARIZONA STATE UNIVERSITY