SWS3009: Embedded System and Deep Learning

Group 10: DL for ES

Smart Terrarium: Carp Yuelongmen

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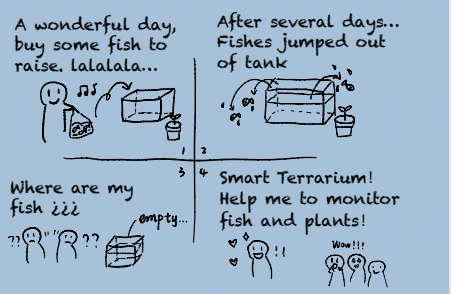
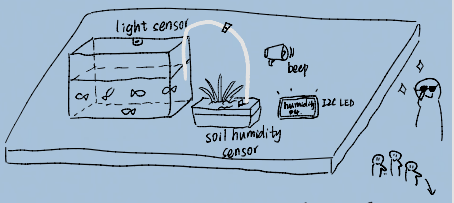
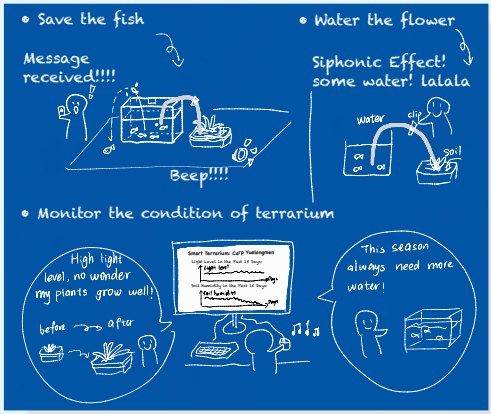
Introduction



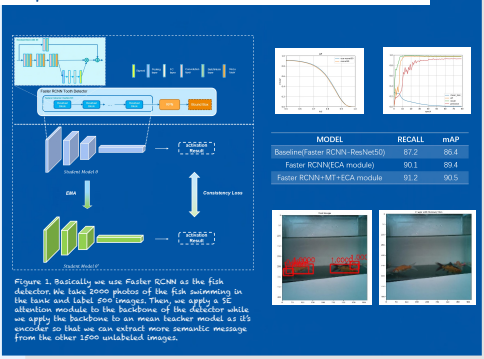
The smart terrarium, or "Carp Yuelongmen " system, aims to monitor thecondition of fish and plants to build a smart terrarium.



See below for more!



Deep Learning Model-fish detector

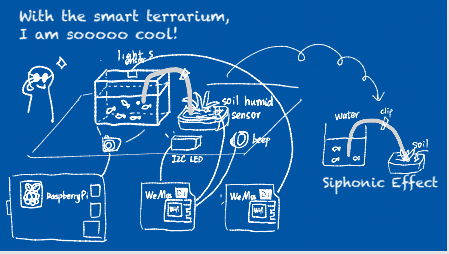


MODEL	RECALL	mAP
Baseline(Faster RCNN-ResNet50)	87.2	86.4
Faster RCNN(ECA module)	90.1	89.4
Faster RCNN+MT+ECA module	91.2	90.5

Figure 1. Basically we use Faster RCNN as the fish detector. We take 2000 photos of the fish swimming in the tank and label 500 images. Then, we apply a SE attention module to the backbone of the detector while we apply the backbone to an mean teacher model as it's encoder so that we can extract more semantic message from the other 1500 unlabeled images.

Function Description

This smart terrarium manages to monitor fish and flower well.



K-Mean Decoration Suggestion system