

Smart Terrarium: Carp Yuelongmen

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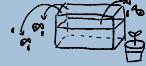
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Introduction

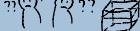
A wonderful day, buy some fish to raise. Lalalala...



After several days...
Fishes jumped out of tank



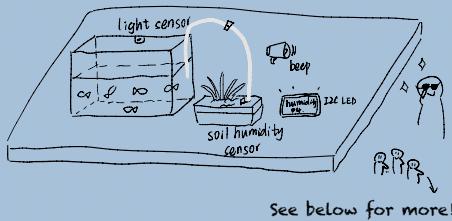
Where are my fish ???
empty...



Smart Terrarium!
Help me to monitor fish and plants!



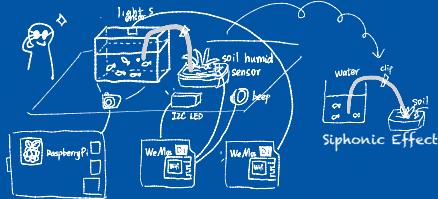
The smart terrarium, or "Carp Yuelongmen" system, aims to monitor the condition of fish and plants to build a smart terrarium.



Function Description

This smart terrarium manages to monitor fish and flower well.

With the smart terrarium,
I am sooooo cool!



• Save the fish

Message received!!!!



• Water the flower

Siphonic Effect!
some water! Lalala



• Monitor the condition of terrarium

High light level, no wonder
my plants grow well!



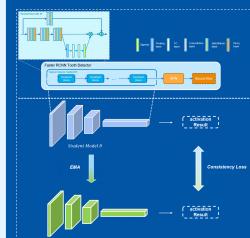
Smart Terrarium: Carp Yuelongmen
The light sensor in the tank
measures the light intensity in the tank
and sends the data to the Raspberry Pi



This season
always need more
water!



Deep Learning Model-fish detector



MODEL	RECALL	mAP
Baseline (Faster RCNN, ResNet50)	87.2	55.6
Faster RCNN+FC module	90.1	89.4
Faster RCNN+MT-FCN module	91.2	90.5

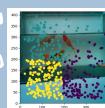
Figure 1: Basically we use Faster RCNN as the fish detector. We take 2000 photos of the fish swimming in the tank and label 800 images. Then we apply a SE attention module to the backbone of the model and add a teacher module to an encoder teacher model as its encoder so that we can extract more semantic message from the other 1200 unlabeled images.

K-Mean Decoration Suggestion system

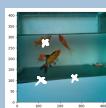
Location data



Original



Kmean Scatter



Centralize