# Plant 도메인 관련
# Object Detection 논문 리뷰

# Plant 도메인 관련 Object Detection 논문

## Objects Detection from Digitized Herbarium Specimen based on Improved YOLO V3

- **ABSTRACT**
  - Automatic measurement of functional trait data from digitized herbarium specimen(DHS) images is of great interest as traditionally, scientists extract such information manually, which is time-consuming and prone to errors.
  - DHS images - seven classes of objects: scale-bar, color pallet, specimen label, envelopes, bar-code and stamp
- improved YOLO V3 full-regression deep neural network architecture
  - for detecting object from digitized herbarium specimen images
  - obvious advantages in both speed and accuracy through capturing deep and high-level features
- challenging in data
  - trained on data provided by the herbarium Haussknecht in Germany
  - occlusions and variations in scale and random placement on herbarium-mounting sheet.
- experimental results indicate that our model performed better with mAP-50 of 93.2% compared to 90.1%

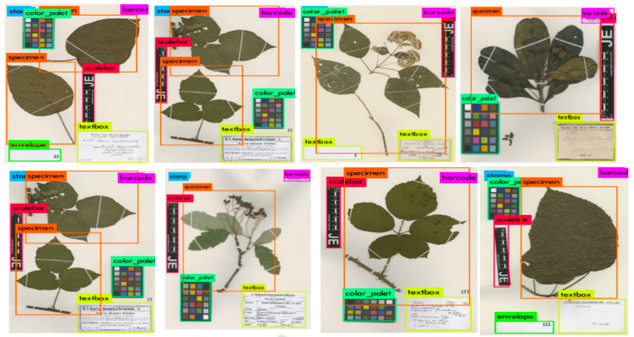

Figure 6: Object detection results by improved YOLO V3 on HHJ dataset.

Table 3: mAP.

| | Original YOLO V3 | Improved YOLO V3 |
|---|---|---|
| mAP | 90.1% | 93.2% |

- **YOLO V3를 선택한 이유**
  - Considering the variability in size and position of objects within the digitized herbarium specimens images
    - > offers a very fast operation speed with good accuracy to predict the objects within the DHS images
- **YOLO V3의 약점**
  - often struggled with small and occluded objects
    - > automatic object detection method based on an improved YOLO V3 deep neural network (based on the Darknet framework) 제안

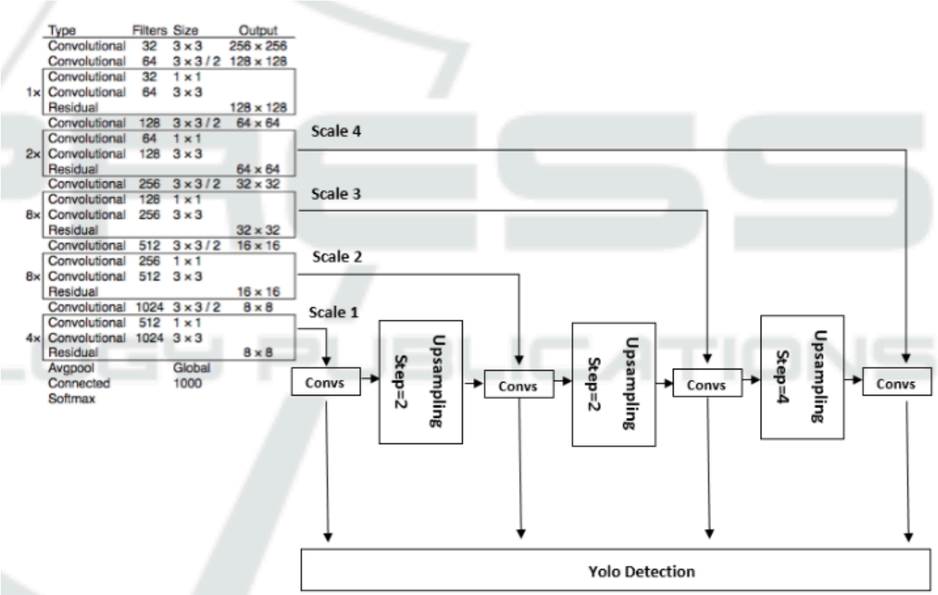


Figure 2: Improved YOLO V3 network structure.

- **YOLO V3에서 개선 - proposed approach**
  - last four scales of feature maps
    - rich in detail localization information to detect small and occluded objects from the DHS (to improve the detection effect on small targets)
  - fourth detection layer by a 4* up-sampled layer instead of 2* to get a feature map with higher resolution and lower level

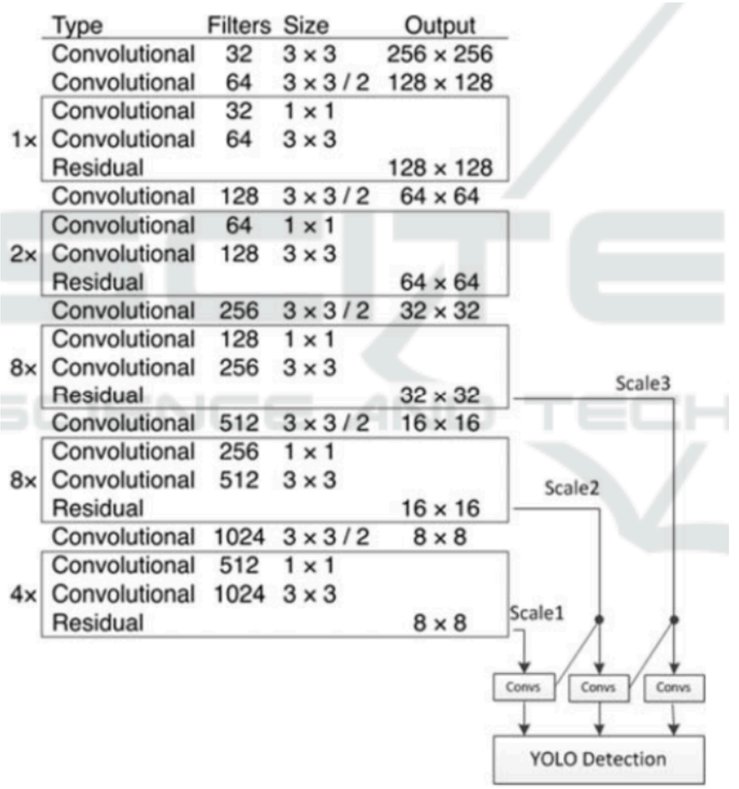


Figure 1: YOLO V3 network structure.