User interface automated testing based on computer vision

- COMP8755 Individual Project

- Widgets and image recognizing driving automated mobile testing of cross-platform based on Yolov3

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Background

GUI Testing

The process of testing a product's graphical user interface to ensure it meets its specifications. This is normally done through the use of a variety of test cases.
Introduction

- Dataset Collection
- Dataset Pre-processing
- Design the Computer version Architecture
- Train the dataset
- Test the dataset
- Analyze the results
- Optimization
- Comparison
Rico was built by mining Android apps at runtime via human-powered and programmatic exploration. Apps are downloaded from the Google Play Store and served to crowd workers through a web interface.

The Rico dataset is large enough to support deep learning applications. We trained an autoencoder to learn an embedding for UI layouts and used it to annotate each UI with a 64-dimensional vector representation encoding visual layout. This vector representation can be used to compute structurally — and often semantically — similar UIs, supporting example-based search over the dataset.
YOLOv3 is an object detection algorithm (based on neural nets) which can be used to detect objects in live videos or static images, it is one of the fastest and accurate object detection methods to date.

The newer architecture boasts of residual skip connections, and up sampling. The most salient feature of v3 is that it makes detections at three different scales. YOLO is a fully convolutional network and its eventual output is generated by applying a $1 \times 1$ kernel on a feature map. In YOLO v3, the detection is done by applying $1 \times 1$ detection kernels on feature maps of three different sizes at three different places in the network.
Expectation results
Future work

1. Compare Yolov3 and other methods, like Fast RCNN.
2. Compare the object detection for different platform
3. Analysis the effect of Yolov3
Reference

