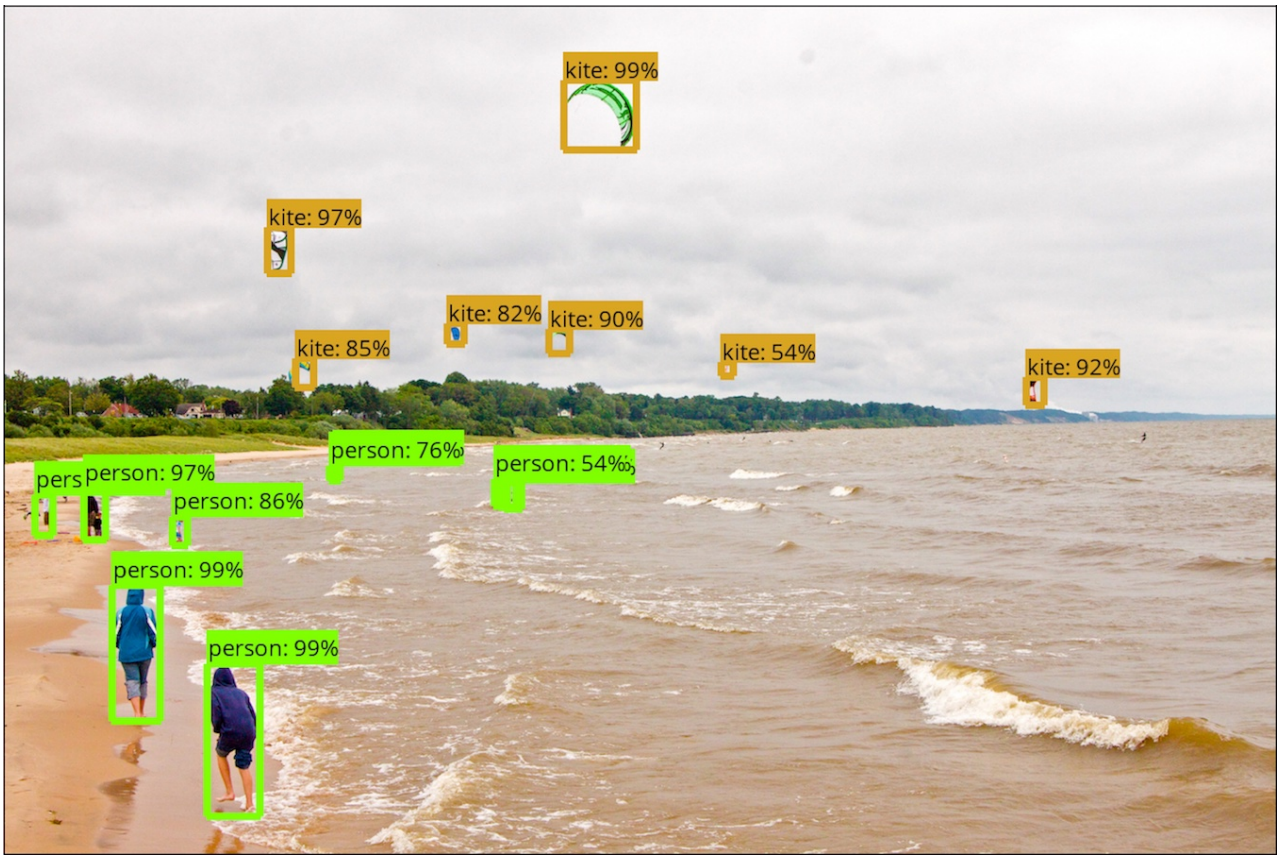
Mini Project 2: Machine Learning

Introduction

Machine Learning become more and more popular and in some aspect, it helps to achieves auto control and production in the industry. So, what is the Machine Learning? Machine Learning is a scientific study of algorithms and statistical models that computer systems use to perform a specific task without explicit instructions, relying on patterns and inference instead(Wikipedia). Generally speaking, it's like training your computer to tell a cat or dog according numbers of pictures. Here, TensorFlow, an open source library, designed by Google, can solve many machine learning missions. The core of the TensorFlow is that it builds a connection between the codes (by users) and the computation graphs. Replying on its API, users don't have to construct their framework, which is painful and unfriendly to the beginners.

Analysis

From the Tensorflow github, instructions posted to users about setup and installation. Here optimize the TensorFlow object detection API and "Mask R-CNN" pre-trained model, which also generate bounding box.


kite: 99%
kite: 97%
kite: 82%
kite: 90%
kite: 85%
kite: 54%
kite: 92%
person: 76%
person: 54%
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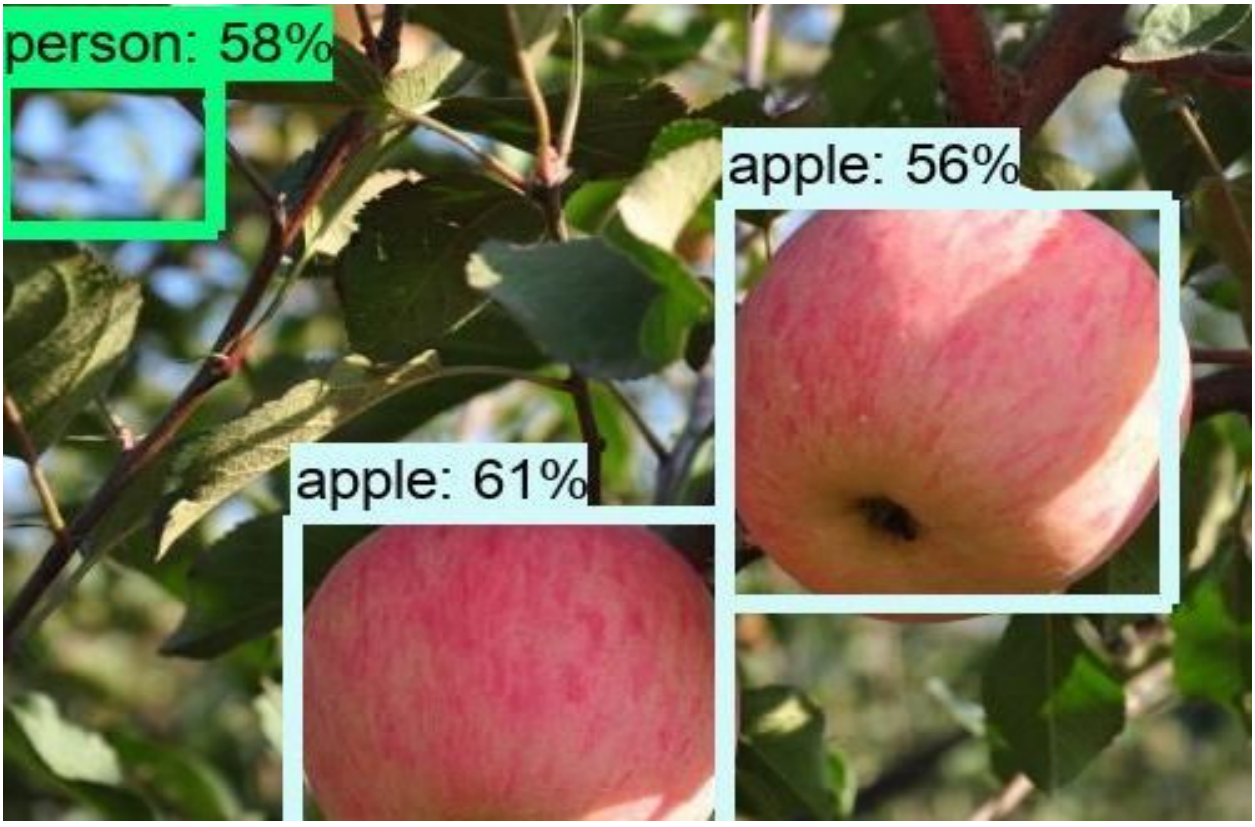
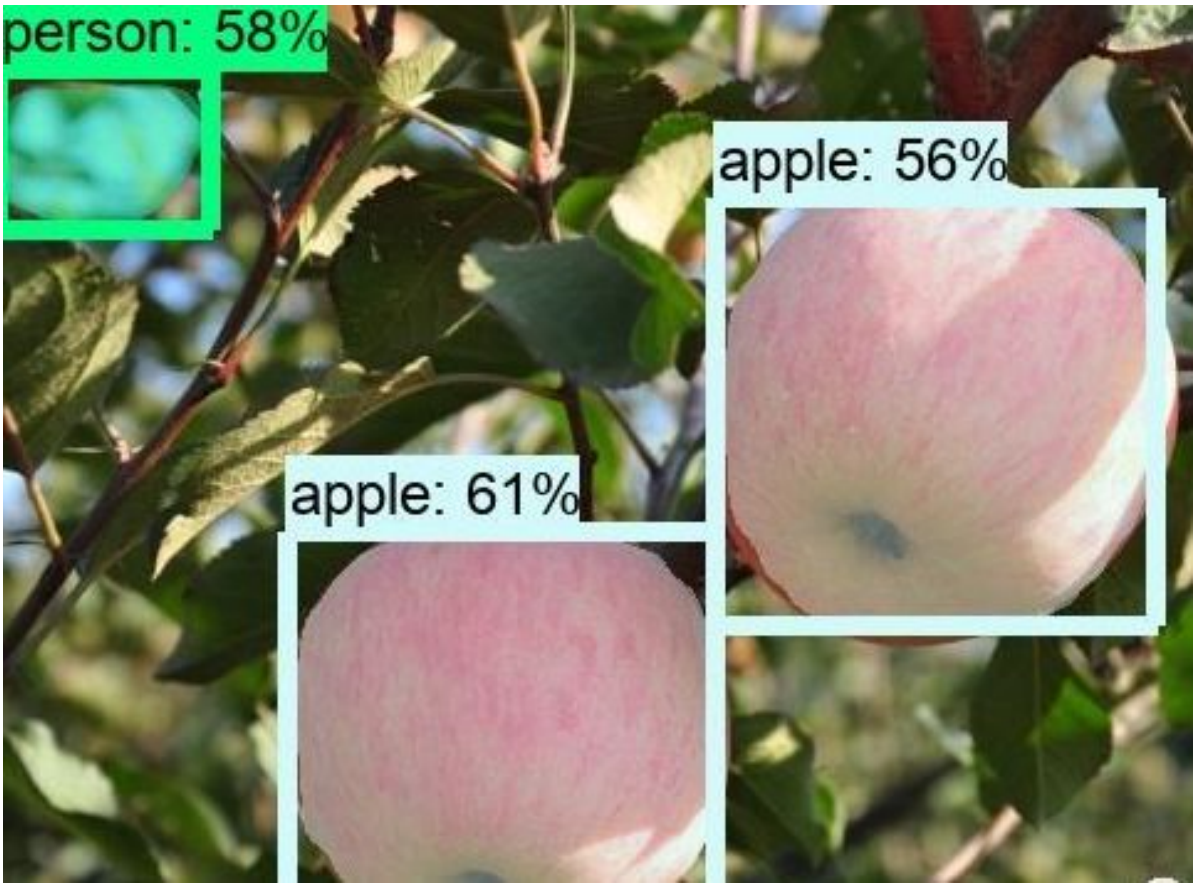
person: 97%
person: 86%
person: 99%
person: 99%


person: 58%
apple: 56%
apple: 61%

generate with bounding boxes



generate with mask

Pros and Cons

Pros:

1. Graphs. TensorFlow has better computational graph visualizations, which are indigenous when compare to others like Theano and Torch.
2. Library. Backed by Google, TensorFlow as an open source library, has a huge collection of dataset. Also, quick update and new release with new features.

3. Scalability. TensorFlow can be used on various hardware machines, which cover from cell devices and computers.

Cons:

1. TensorFlow support computation across GPUs and CPUs. But the TensorFlow doesn't provide GPU support on MacOS.
2. Every computation need to be called from a session handler. That means that using a TensorFlow is like using another language.

Recommendation

TensorFlow is a friendly tool to start Machine Learning for the beginners. Before start it, it's better have a good review about some basic concepts and definition. Have some Python basic knowledge. TensorFlow fully support Python. It's easy to run on python environment.