Train face detector from scratch using TensorFlow Object Detection API:  
<https://github.com/tensorflow/models/tree/master/research/object_detection>

Dataset: WIDER FACE  
<http://shuoyang1213.me/WIDERFACE/>  
  
Detector specification  
Backbone: MobileNetv2  
Detection head: SSD  
Input resolution: 128x128  
Validation dataset: <https://drive.google.com/file/d/1cbazjRELfd4mGaNWQnQB7essJBM0BAe0/view?usp=sharing>

See samples of config files for different architectures  
<https://github.com/tensorflow/models/tree/master/research/object_detection/samples/configs>

Description of config parameters can be found in corresponding proto files  
<https://github.com/tensorflow/models/tree/master/research/object_detection/protos>  
  
**What is expected to be done**

Average precision (AP) on validation dataset should be higher than 0.5

Investigate effect of different training parameters on accuracy:

* with/without Feature Pyramid Network
* focal loss VS hard negative mining
* image augmentation
* optimization parameters: learning rate schedule, Adam, SGD

Demonstrate results: describe what was done, show plots of loss and accuracy during training, show examples with correct predictions and incorrect

**Pipeline**

* Parse dataset
* Prepare training and validation data in suitable for TF Object detection format
* Setup config file
* Run training
* Make experiments