Week 2

Advanced Computer Vision with TensorFlow

Week 2

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Object Detection

This week, you'll get an overview of some popular object detection models, such as regional-CNN and ResNet-50. You'll use object detection models that you'll retrieve from TensorFlow Hub, download your own models and configure them for training, and also build your own models for object detection. By using transfer learning, you will train a model to detect and localize rubber duckies using just five training examples. You'll also get to manually label your own rubber ducky images!

Less

Learning Objectives

- Get a conceptual overview of Regional CNN (R-CNN), Fast-RCNN, and Faster R-CNN.
- Retrieve the R-CNN model from TensorFlow hub and use it to perform object detection.
- Use TensorFlow's object detection API to visualize the predicted bounding boxes from an object detection model
- Go beyond models in TensorFlow Hub: Load and configure a Resnet-50 model that isn't on TensorFlow Hub, restore pre-trained weights, and select the parts of the model to retrain.
- Use the object detection API to manually annotate images for object detection
- Implement a custom training loop to fine-tune a model using just 5 training examples.

Less

Object Detection

Video: Object Detection and Sliding Windows 5 min — Resume

Reading: References: Amazon Rekognition, PowerAI & DIGITS 10 min

Video: R-CNN 3 min

Video: Fast R-CNN 3 min

Video: Faster R-CNN 1 min

Reading: Reference: R-CNN, Fast R-CNN 10 min

Object Detection in TensorFlow

Video: Getting the Model from TensorFlow Hub 1 min

Reading: Reference: TensorFlow Hub 10 min

Video: Running the Model on an Image 2 min

Lab: Implement Simple Object Detection 1h

Lab: Predicting Bounding Boxes for Object Detection 1h

Object Detection APIs

Video: Installation and overview of APIs 4 min

Video: Visualization with APIs 3 min

Reading: Read about the Object Detection API 10 min

Reading: Use the Object Detection API 30 min

Retraining with the Object Detection API

Video: Loading a RetinaNet Model 5 min

Reading: Reference: RetinaNet, Model Garden 10 min

Video: Loading Weights 4 min

Video: Data Prep and Training Overview 3 min

Video: Custom Training Loop Code 4 min

Reading: Eager Few Shot Object Detection 30 min

Week 2 Quiz: Object Detection

Quiz: Object Detection 8 questions Due Mar 22, 1:59 AM CDT

Assignment: Zombie Detector

Programming Assignment: Zombie Detector 1h Due Mar 22, 1:59 AM CDT