

Deep Learning - lab 7

Object detection

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Classification with localization

Keras

```
import tensorflow as tf

inputs = tf.keras.layers.Input(shape=(28, 28, 1))
c1 = tf.keras.layers.Conv2D(64, 3, activation='relu')(inputs)
c2 = tf.keras.layers.MaxPooling2D((3, 3))(c1)
...
cN = tf.keras.layers.Flatten()(cN_1)
x = tf.keras.layers.Dense(128, activation='relu')(cN)

# output for classifier
o1 = tf.keras.layers.Dense(10, activation='softmax', name='classifier')(x)
# output for bbox regressor
o2 = tf.keras.layers.Dense(4, name='regressor')(x)

model = tf.keras.Model(inputs=inputs, outputs=[o1, o2])
```

Keras

```
model.compile(optimizer=...,
              loss={
                  'classifier': 'categorical_crossentropy',
                  'regressor': 'mse'
              },
              metrics=[
                  'classifier': 'acc',
                  'regressor': 'mse'
              ])
model.fit(train_images, (train_labels, train_bbox), ...)
```

Object detection



TensorFlow Model Garden

python 3.7 | 3.8 | 3.9 | 3.10 | pypi package 2.8.0

Welcome to the Model Garden for TensorFlow

The TensorFlow Model Garden is a repository with a number of different implementations of state-of-the-art (SOTA) models and modeling solutions for TensorFlow users. We aim to demonstrate the best practices for modeling so that TensorFlow users can take full advantage of TensorFlow for their research and product development.

To improve the transparency and reproducibility of our models, training logs on [TensorBoard.dev](#) are also provided for models to the extent possible though not all models are suitable.

Directory	Description
official	<ul style="list-style-type: none">A collection of example implementations for SOTA models using the latest TensorFlow 2's high-level APIsOfficially maintained, supported, and kept up to date with the latest TensorFlow 2 APIs by TensorFlowReasonably optimized for fast performance while still being easy to read
research	<ul style="list-style-type: none">A collection of research model implementations in TensorFlow 1 or 2 by researchersMaintained and supported by researchers
community	<ul style="list-style-type: none">A curated list of the GitHub repositories with machine learning models and implementations powered by TensorFlow 2
orbit	<ul style="list-style-type: none">A flexible and lightweight library that users can easily use or fork when writing customized training loop code in TensorFlow 2.x. It seamlessly integrates with <code>tf.distribute</code> and supports running on different device types (CPU, GPU, and TPU).

Detectron2



Detectron2

Support Ukraine

Detectron2 is Facebook AI Research's next generation library that provides state-of-the-art detection and segmentation algorithms. It is the successor of [Detectron](#) and [maskrcnn-benchmark](#). It supports a number of computer vision research projects and production applications in Facebook.



<https://github.com/facebookresearch/detectron2>



The image shows the MMDetection project page on GitHub. At the top is the large blue "MMDetection" logo. Below it are two navigation links: "OpenMMLab website HOT" and "OpenMMLab platform TRY IT OUT". Underneath these are several status indicators: "pypl v2.24.1", "docs latest", "build failing", "codecov 65%", "license Apache-2.0", and "open issues 12%". Below these are three examples of object detection results. The first example shows a crowded scene with people and bicycles, all labeled with bounding boxes and confidence scores. The second example shows a pink chair on a grassy area. The third example shows zebras in a savanna-like environment. At the bottom are links for "Documentation", "Installation", "Model Zoo", "Update News", "Ongoing Projects", and "Reporting Issues".

[Documentation](#) | [Installation](#) | [Model Zoo](#) | [Update News](#) | [Ongoing Projects](#) | [Reporting Issues](#)

<https://github.com/open-mmlab/mmdetection>