

ni-2. 物体検出

(人工知能の実行)

URL: <https://www.kkaneko.jp/ai/ni/index.html>

金子邦彦



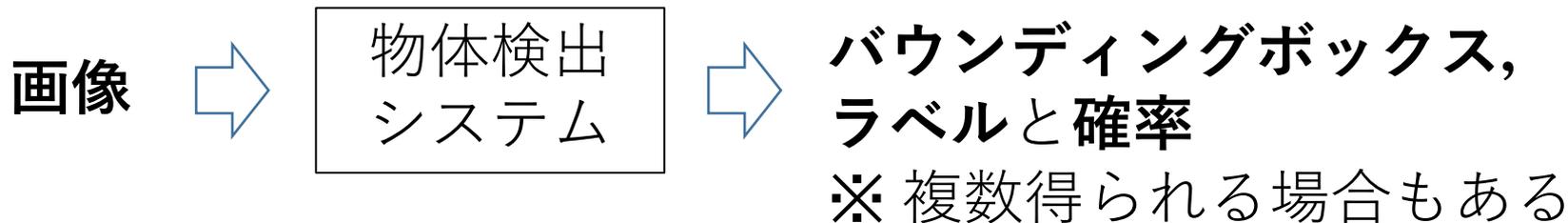
物体検出



- **物体検出**は、**画像の中の物体**について、**場所**、**範囲**、**種類**を得ること。

場所、**範囲**：**バウンディングボックス**

種類：**ラベルと確率**



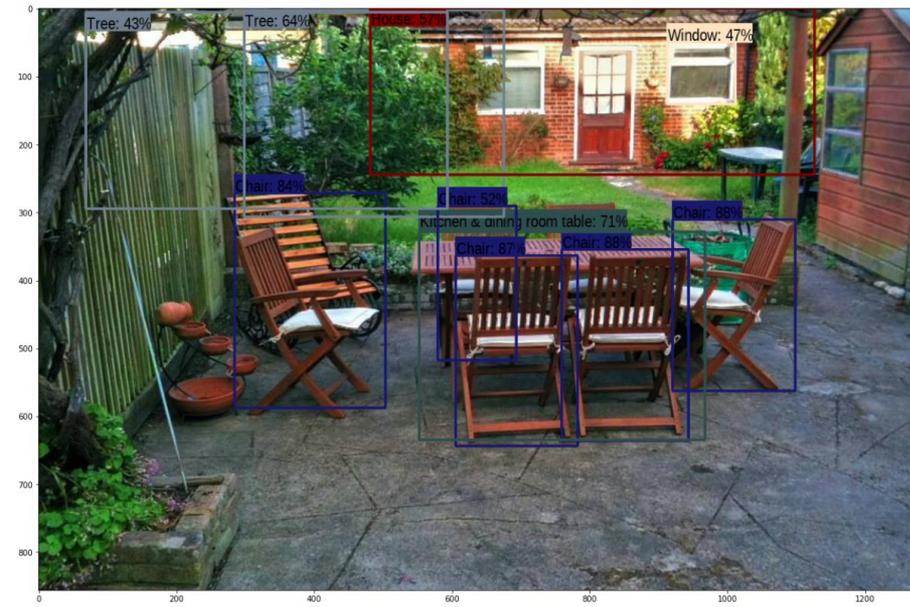
物体検出の例



Image downloaded to /tmp/tmpo9k12q6n.jpg.



Found 100 objects.
Inference time: 37.17011475563049



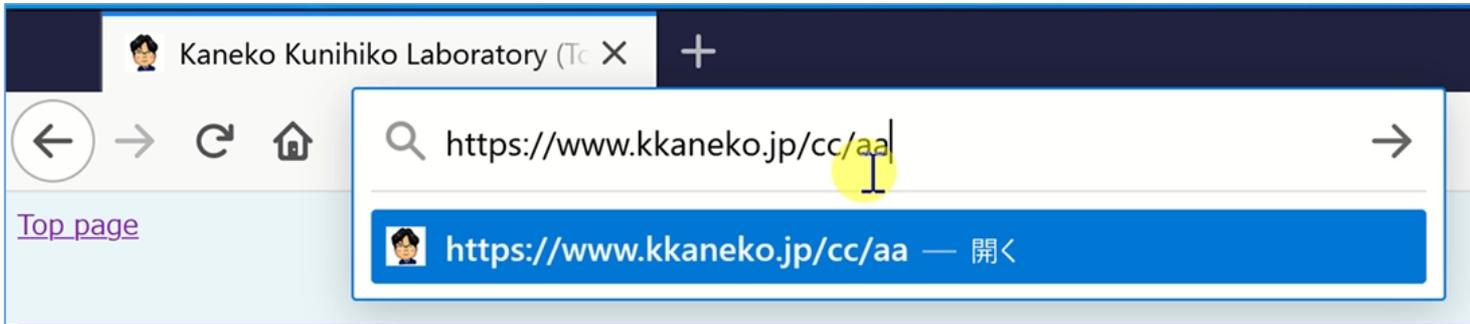
画像

バウンディングボックス,
ラベルと確率

※ 多数の物体が検出されている

Google の Object Detection のページ
Google Colaboratory ノートブック形式

https://colab.research.google.com/github/tensorflow/hub/blob/master/examples/colab/object_detection.ipynb



金子邦彦研究室の「人工知能応用」のページ <https://www.kkaneko.jp/cc/aa>

2. di-2. 物体認識 [\[PDF\]](#), [\[パワーポイント\]](#)

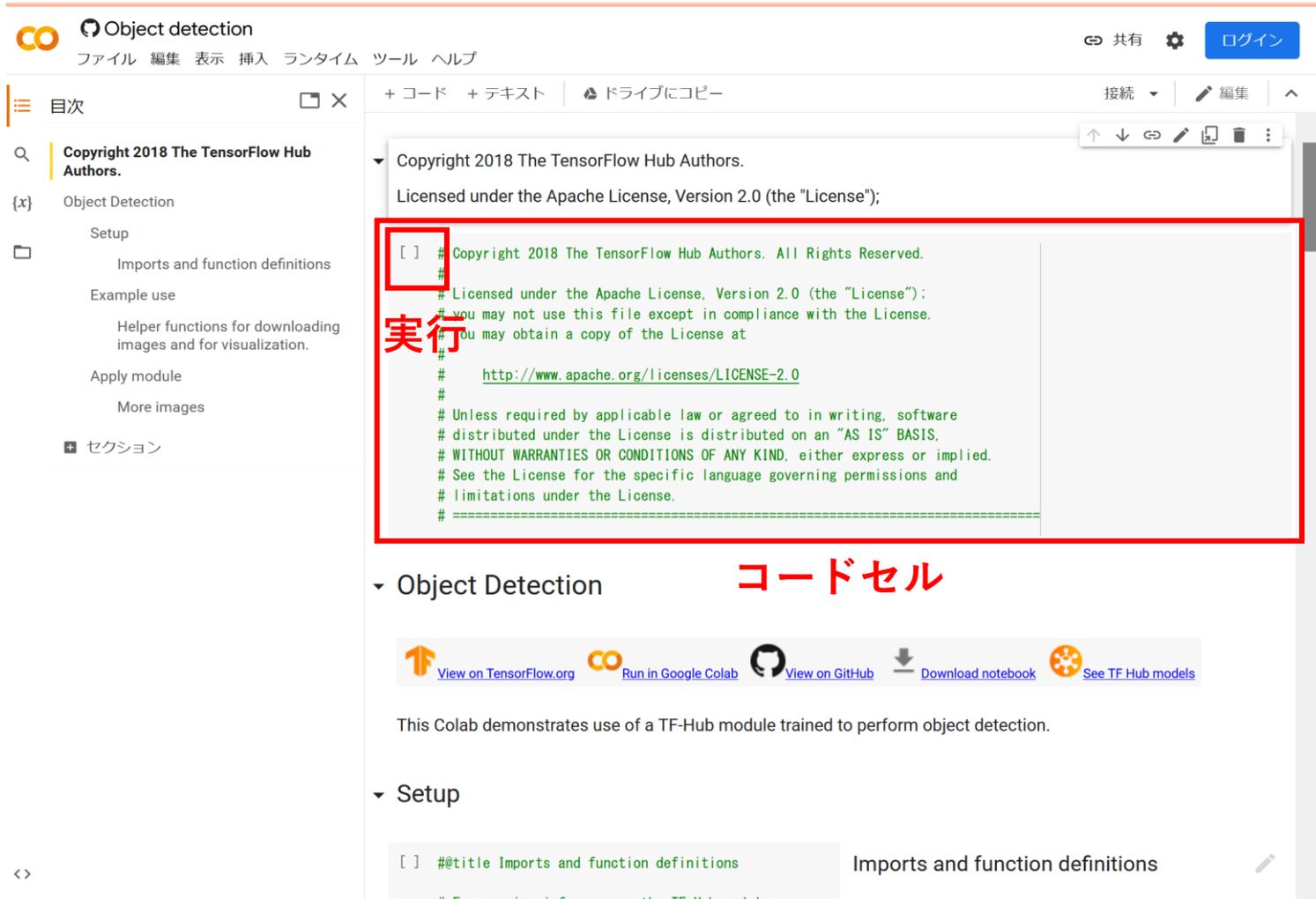
, 動画: [\[mp4 形式動画\]](#)

https://colab.research.google.com/github/tensorflow/hub/blob/master/examples/colab/object_detection.ipynb

2番のところに

https://colab.research.google.com/github/tensorflow/hub/blob/master/examples/colab/object_detection.ipynb

へのリンクを置いている。



Object detection

Copyright 2018 The TensorFlow Hub Authors.

Licensed under the Apache License, Version 2.0 (the "License");

```
[ ] # Copyright 2018 The TensorFlow Hub Authors. All Rights Reserved.  
#  
# Licensed under the Apache License, Version 2.0 (the "License");  
# you may not use this file except in compliance with the License.  
# You may obtain a copy of the License at  
#  
# http://www.apache.org/licenses/LICENSE-2.0  
#  
# Unless required by applicable law or agreed to in writing, software  
# distributed under the License is distributed on an "AS IS" BASIS,  
# WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.  
# See the License for the specific language governing permissions and  
# limitations under the License.  
# =====
```

Object Detection

Setup

Imports and function definitions

Code cell

View on TensorFlow.org Run in Google Colab View on GitHub Download notebook See TF Hub models

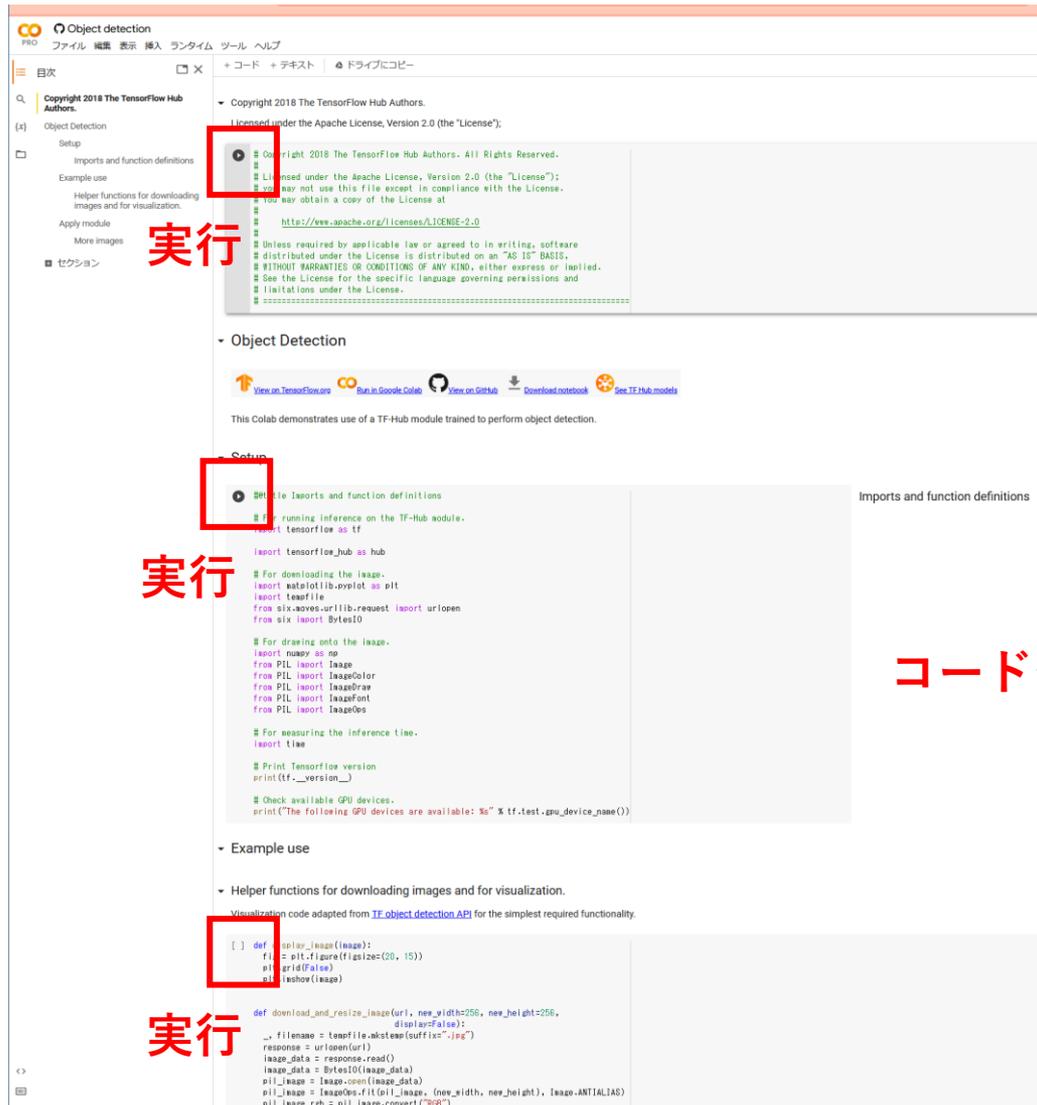
This Colab demonstrates use of a TF-Hub module trained to perform object detection.

Setup

```
[ ] #@title Imports and function definitions
```

Google Colaboratory ノートブック

コードセルの実行には、Google アカウントでのログインが必要



Copyright 2018 The TensorFlow Hub Authors.
Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
You may obtain a copy of the License at
<http://www.apache.org/licenses/LICENSE-2.0>
Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.

Object Detection

Setup

```
!pip install tensorflow-hub
import tensorflow_hub as hub
import tensorflow as tf

# For downloading the image.
import matplotlib.pyplot as plt
import tensorflow
from six.moves.urllib.request import urlopen
from six import BytesIO

# For drawing onto the image.
import numpy as np
from PIL import Image
from PIL import ImageColor
from PIL import ImageDraw
from PIL import ImageFont
from PIL import ImageOps

# For measuring the inference time.
import time

# Print Tensorflow version
print(tf.__version__)

# Check available GPU devices.
print("The following GPU devices are available: %s" % tf.test.gpu_device_name())
```

Example use

Helper functions for downloading images and for visualization.

Visualization code adapted from [TF object detection API](#) for the simplest required functionality.

```
[ ] def display_image(image):
    fig = plt.figure(figsize=(20, 15))
    plt.grid(False)
    plt.imshow(image)

def download_and_resize_image(url, new_width=256, new_height=256,
                              display=False):
    _, filename = tempfile.mkstemp(suffix=".jpg")
    response = urlopen(url)
    image_data = response.read()
    image_data = BytesIO(image_data)
    pil_image = Image.open(image_data)
    pil_image = ImageOps.fit(pil_image, (new_width, new_height), Image.ANTIALIAS)
    pil_image_rgb = pil_image.convert("RGB")
```

コードセル

実行

コードセル

実行

コードセル

実行

一番上のコードセルから順々に実行

