

ni-2. 物体検出

(人工知能の実行)

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

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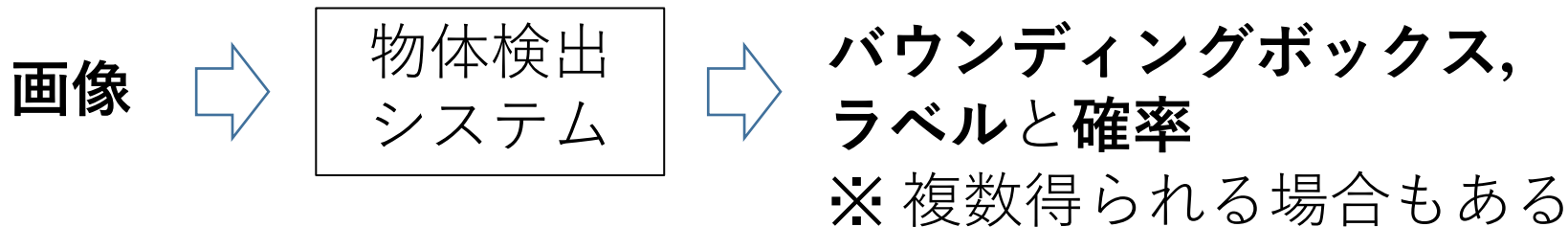
物体検出



- **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**



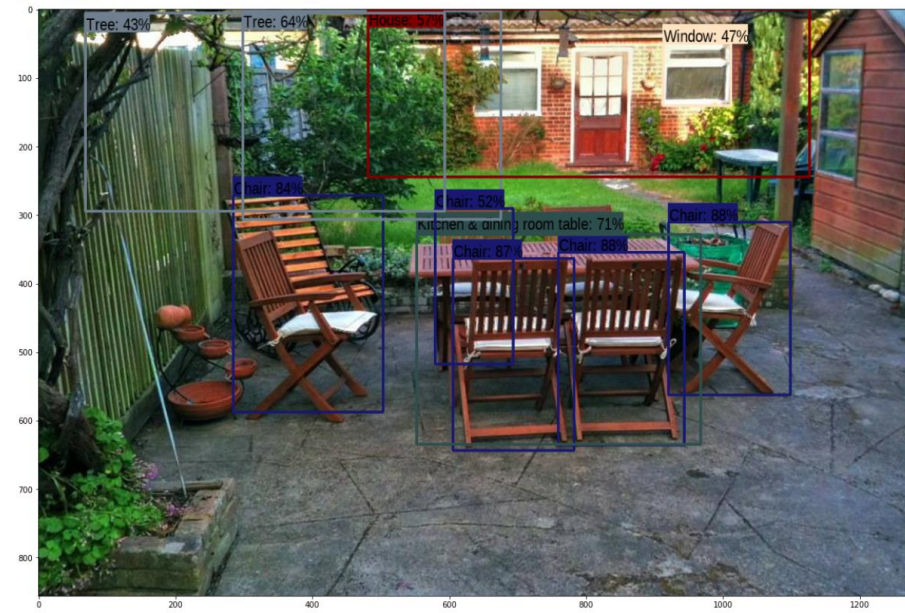
物体検出の例



Image downloaded to /tmp/tmpo9k12q6n.jpg.



Found 100 objects.
Inference time: 37.17011475563049



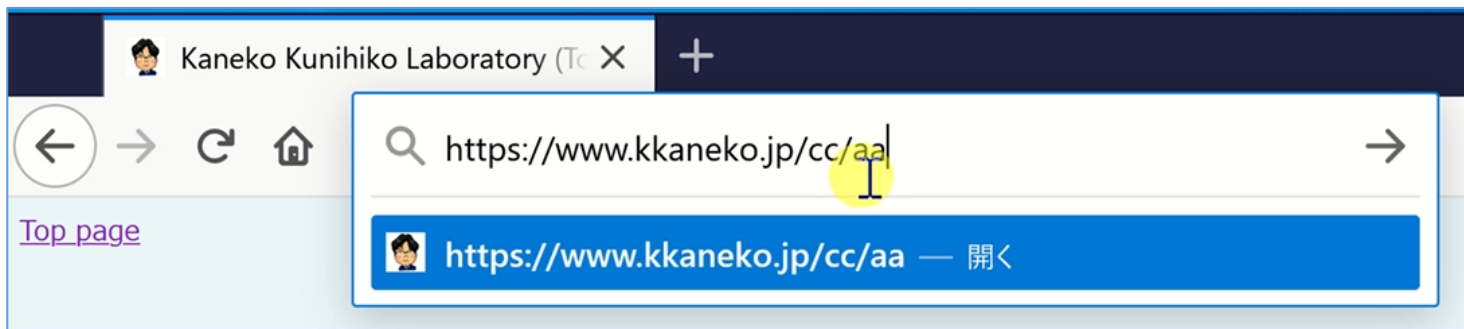
画像

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 [\[PDF\]](#), [\[パワーポイント\]](#)

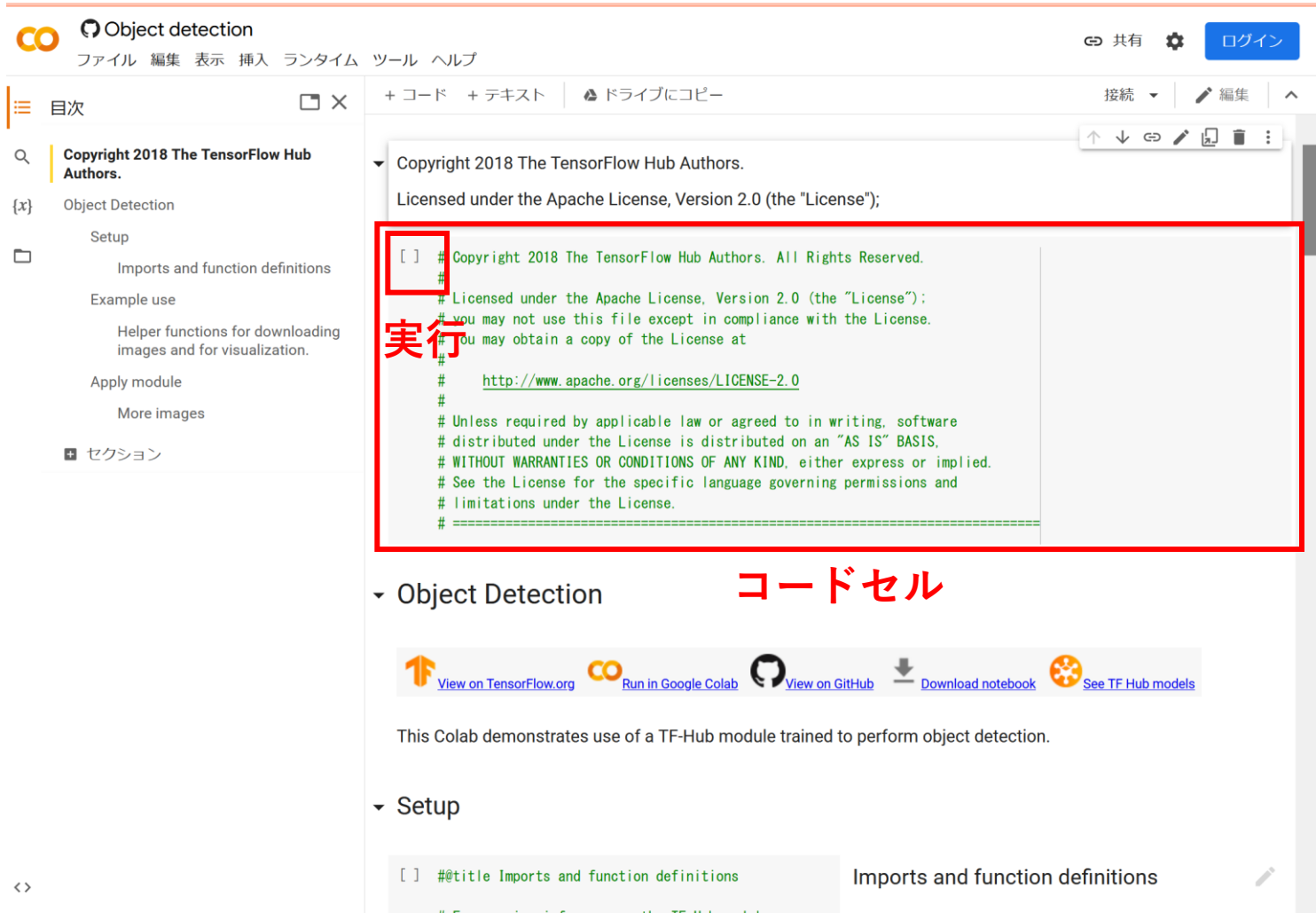
, 動画: [\[mp4 形式動画\]](#)

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

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```
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# =====
```

実行

コードセル

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

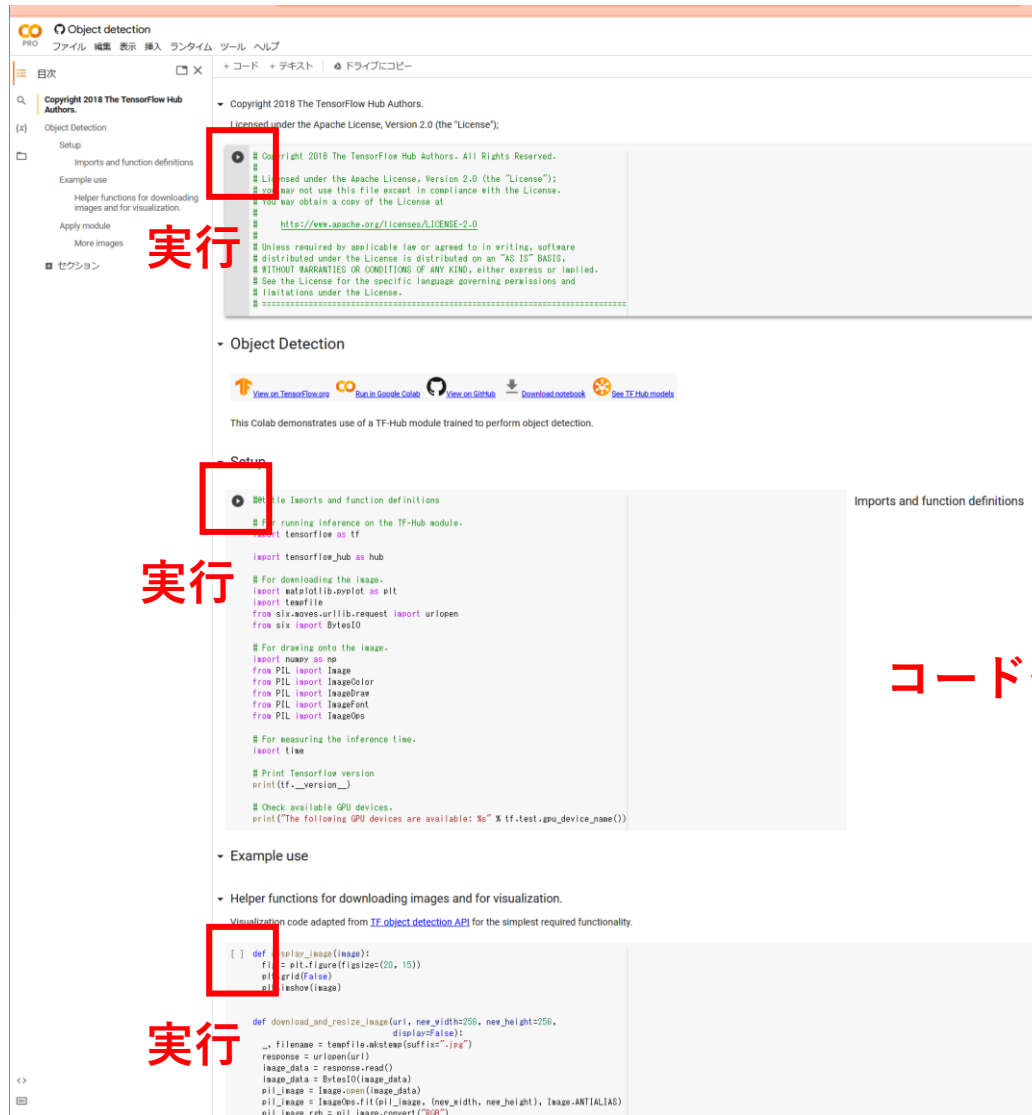
This Colab demonstrates use of a TF-Hub module trained to perform object detection.

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



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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

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一番上のコードセルから順々に実行

