



Women
Techmakers



Google Developer Groups

Google Developer Student Clubs

Keras-CV Object Detection

Live ((•))

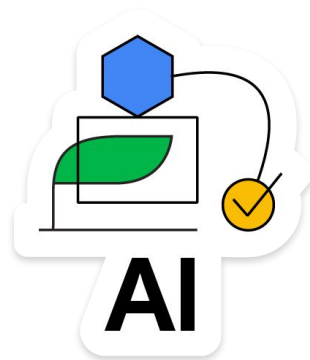
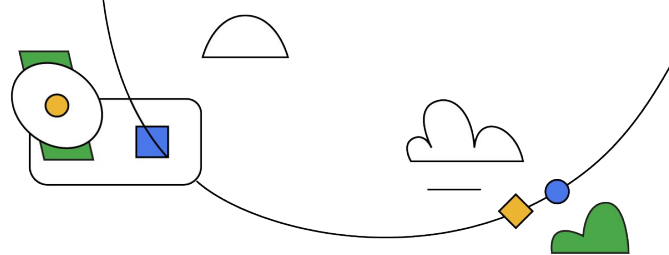


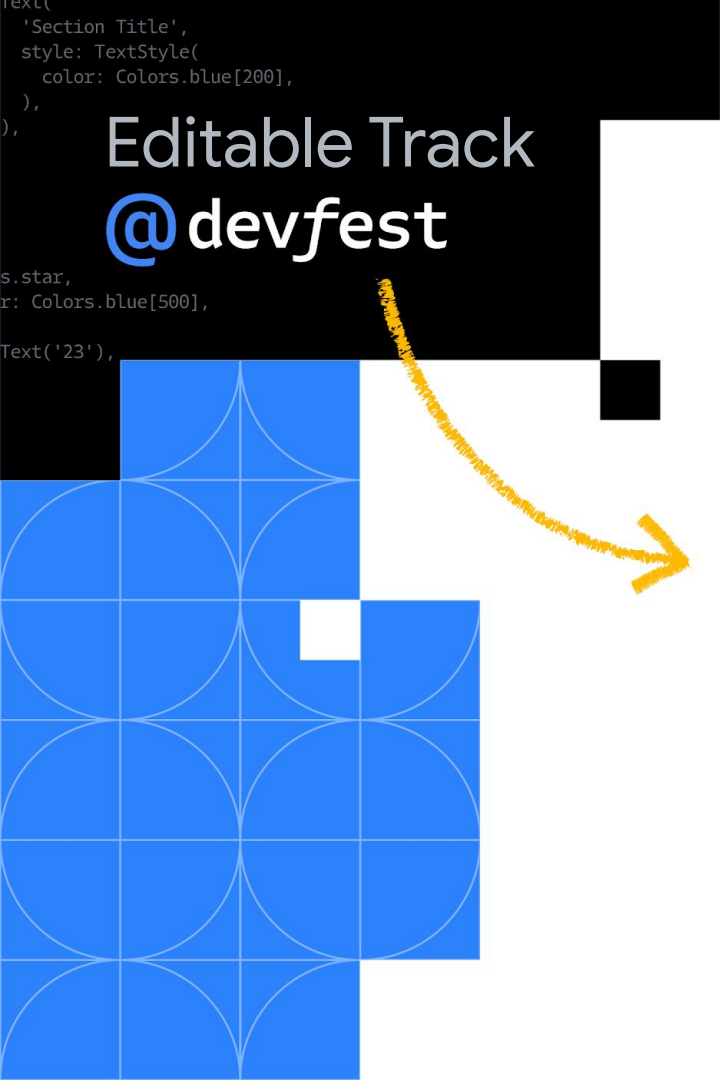
Imen Masmoudi

@WTM Ambassador

Agenda

1. Applied ML with Keras-CV & Keras-NLP
2. Keras-CV for Object Detection
3. From Matplotlib to Open-CV
4. Live Demo





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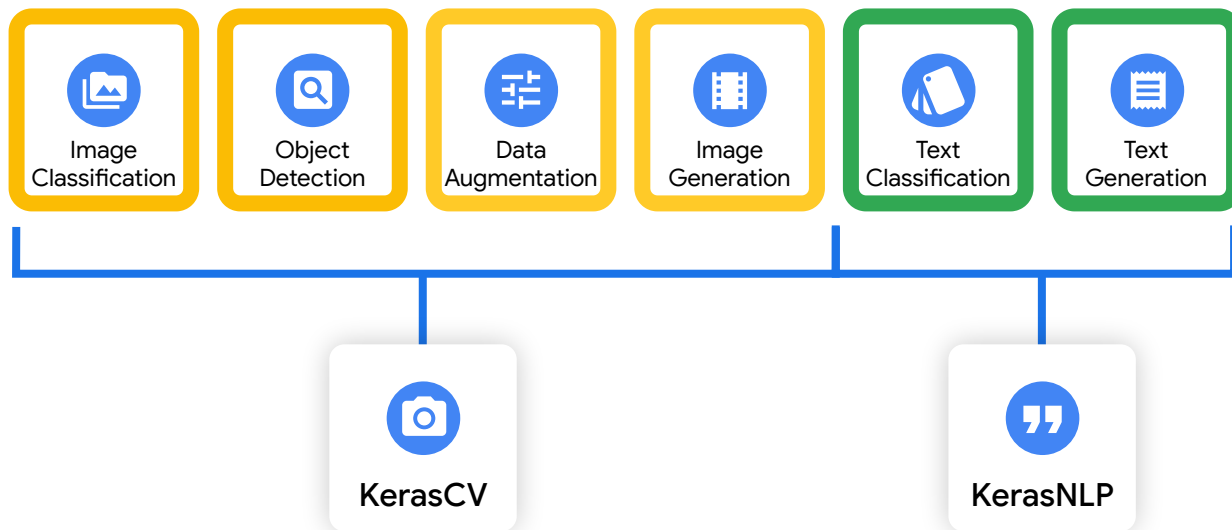
Applied ML with Keras-CV & Keras-NLP

Keras-CV

Applied ML with KerasCV & KerasNLP

The cutting edge of machine learning, right at your fingertips.

What can you do with KerasCV and KerasNLP?



Libraries for state of the art **computer vision** and **natural language processing**.
From idea to implementation in just a few lines of code!

Why KerasCV and KerasNLP?



**SOTA models,
written in minutes**

BERT, GPT-2, Stable Diffusion, ResNet,
RetinaNet, etc.



**Integrated with
the TF Ecosystem**

TFLite, DTensor, XLA, TPUs, and beyond



**Easy to
get started**

Readable and modular design with
great documentation

What can you do with KerasCV?

Image Classification

1



1



1



0



1



0

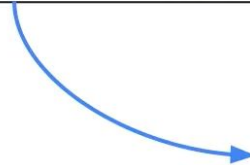



```
from keras_cv.models import (  
    ResNetBackbone, ImageClassifier,  
)  
  
backbone = ResNetBackbone.from_preset(  
    "resnet50_imagenet",  
)
```

```
from keras_cv.models import (  
    ResNetBackbone, ImageClassifier,  
)  
  
backbone = ResNetBackbone.from_preset(  
    "resnet50_imagenet",  
)  
model = ImageClassifier(  
    backbone=backbone,  
    num_classes=2,  
)
```

```
from keras_cv.models import (  
    ResNetBackbone, ImageClassifier,  
)  
  
backbone = ResNetBackbone.from_preset(  
    "resnet50_imagenet",  
)  
model = ImageClassifier(  
    backbone=backbone,  
    num_classes=2,  
)  
model.compile(...)  
model.fit(cat_vs_dog_dataset)
```

Data Augmentation



```
from keras_cv.layers import (
    CutMix, MixUp, RandAugment, RandomFlip,
)

augmenter = keras.Sequential(
    [
        RandomFlip(),
        RandAugment(value_range=(0, 255)),
        CutMix(),
        MixUp(),
    ],
)

train_dataset = flowers_dataset.map(augmenter)
```

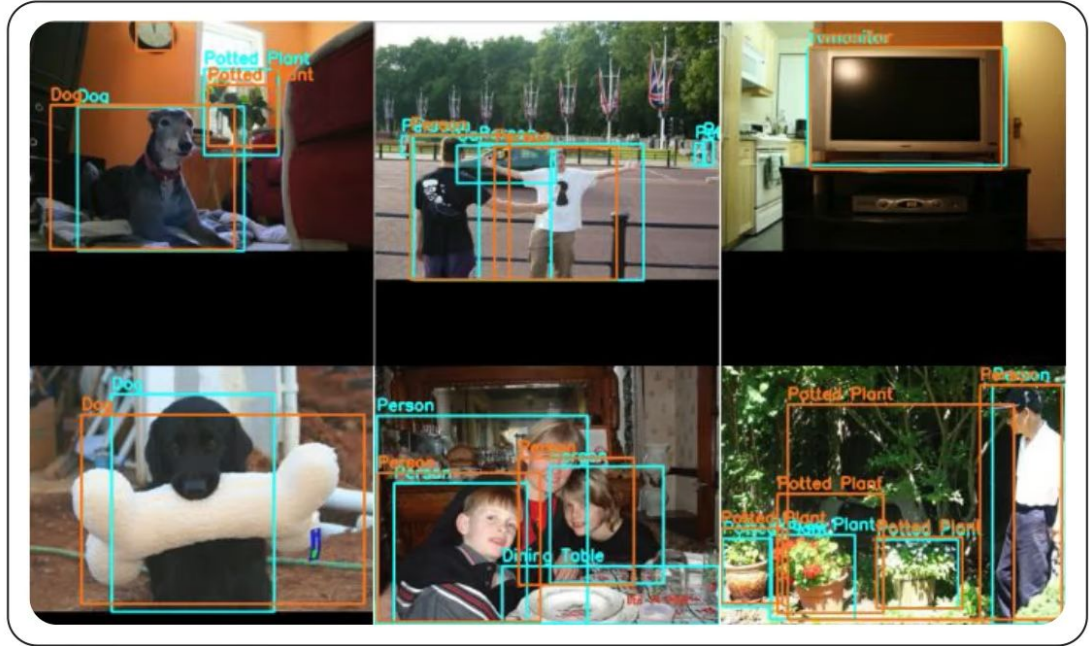
Image Generation

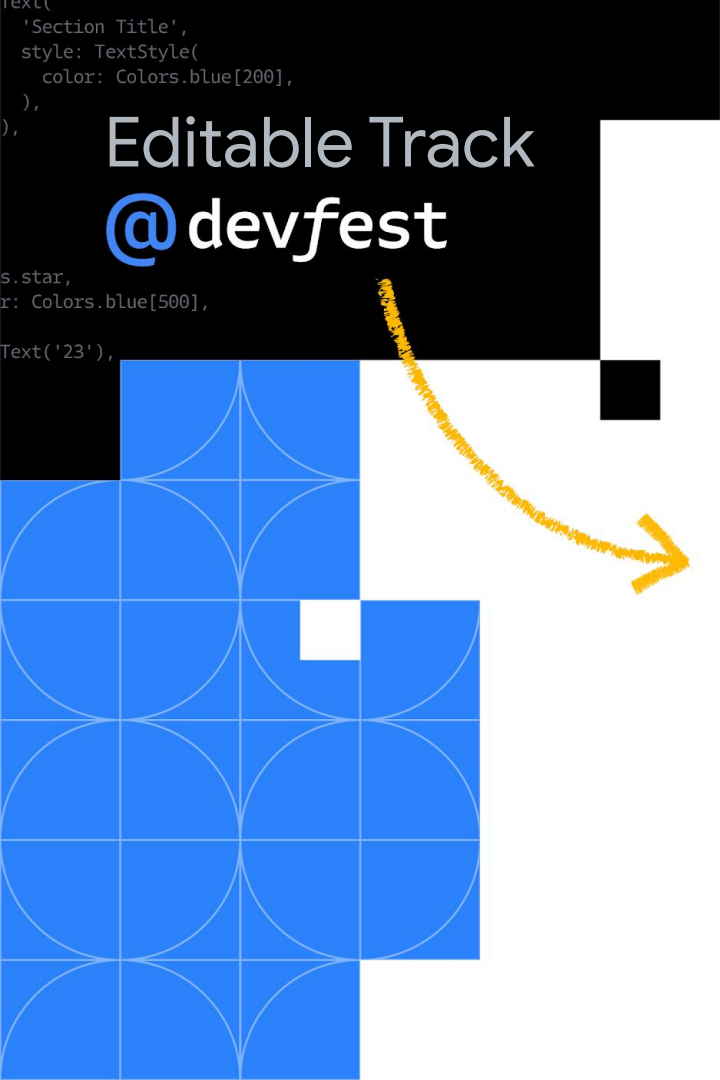


Text to image

```
from keras_cv.models import (  
    StableDiffusion,  
)  
  
model = StableDiffusion(  
    img_width=512,  
    img_height=512,  
)  
  
images = model.text_to_image(  
    "photograph of an astronaut "  
    "riding a horse",  
    batch_size=3,  
)
```

Object Detection





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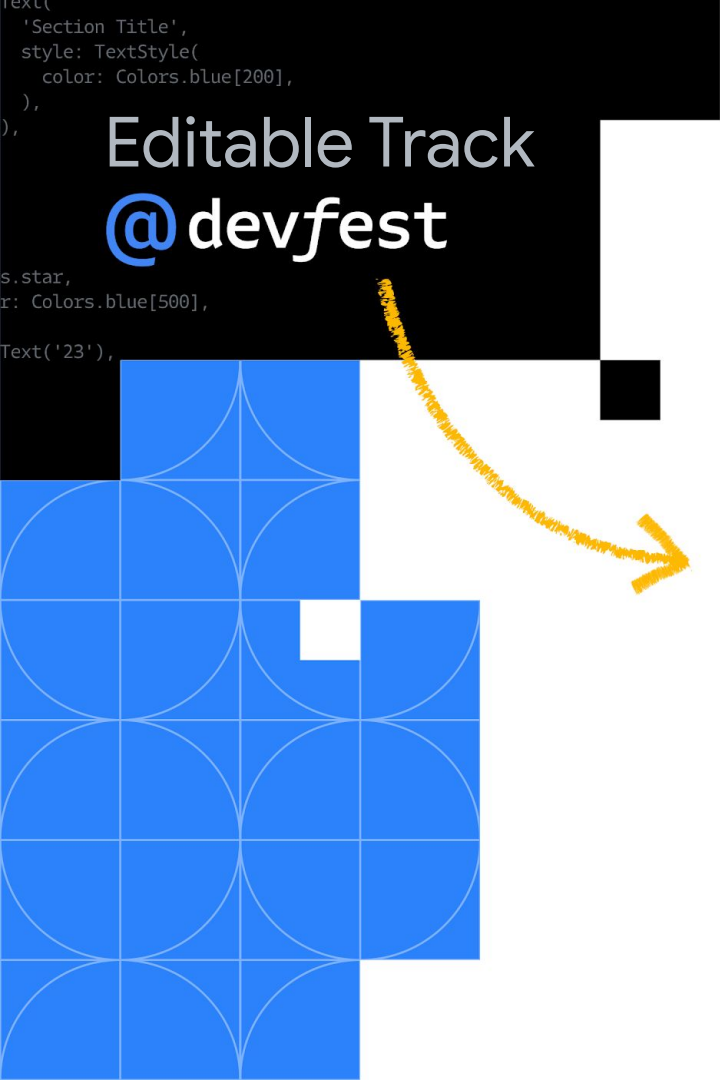
Keras-CV for Object Detection

Here's a quick look!

Want to learn more? Take a deep dive in our full talk on KerasCV/NLP!

[Object Detection](#)





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**From Matplotlib to
Open-CV**



Let's Explore!

The prediction:

```
[ ] 1 type(y_pred)
```

```
dict
```

```
[ ] 1 len(y_pred)
```

```
4
```

```
[ ] 1 y_pred.keys()
```

```
dict_keys(['boxes', 'confidence', 'classes', 'num_detections'])
```



Let's Explore!

The prediction:

```
[ ] 1 type(y_pred['boxes'])
```

```
numpy.ndarray
```

```
[ ] 1 y_pred['boxes'].shape
```

```
(1, 100, 4)
```



Let's Explore!

The prediction:

```
[ ] 1 type(y_pred['confidence'])  
numpy.ndarray
```

```
[ ] 1 y_pred['confidence'].shape  
(1, 100)
```



Let's Explore!

The prediction:

```
[ ] 1 type(y_pred['classes'])
```

```
numpy.ndarray
```

```
[ ] 1 y_pred['classes'].shape
```

```
(1, 100)
```



Let's Explore!

The prediction:

```
[ ] 1 type(y_pred['num_detections'])  
numpy.ndarray
```

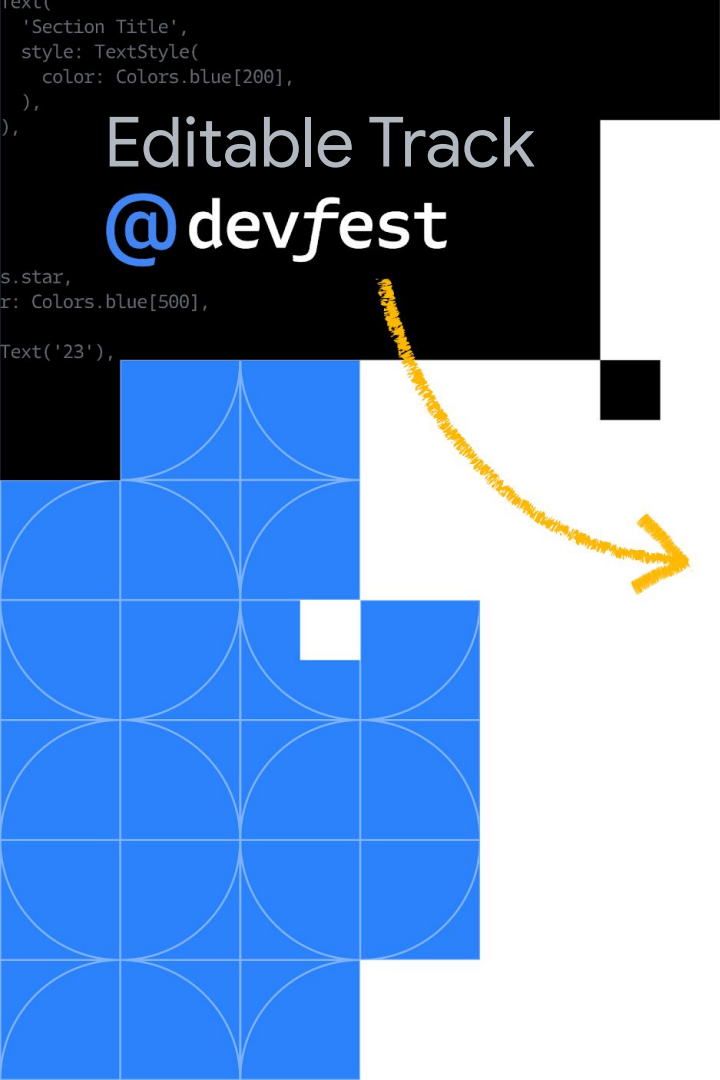
```
[ ] 1 y_pred['num_detections'].shape  
(1,)
```



Now into action!

Open CV

```
[ ] 1     for i in np.arange(0, y_pred['num_detections'][0]):
2         confidence = y_pred['confidence'].numpy()[0, i]
3         if confidence > 0.5:
4             idx = int(y_pred['classes'].numpy()[0, i])
5             if class_ids[idx] == class_ids[14]:
6                 cow_box = y_pred['boxes'].numpy()[0, i, :]
7                 (startX, startY, endX, endY) = cow_box.astype("int")
8                 (startX, startY, endX, endY) = (startX, startY, startX + endX, startY + endY)
9                 cv2.rectangle(image, (startX, startY), (endX, endY), (0, 255, 0), 5)
10    cv2.imshow('Demo', image)
```

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Live Demo

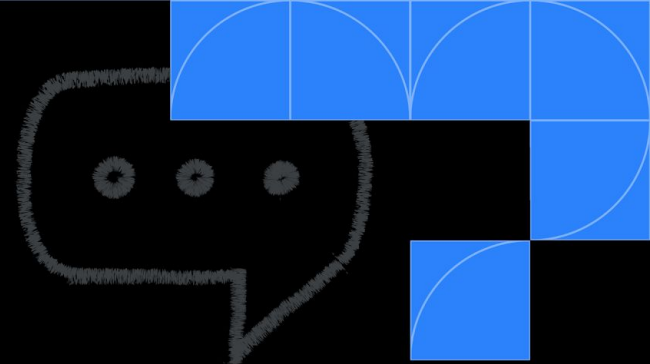
Code

github.com/ImenMasmoudiEm/Keras-CV-OD-Demo-Video

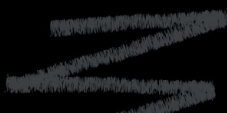
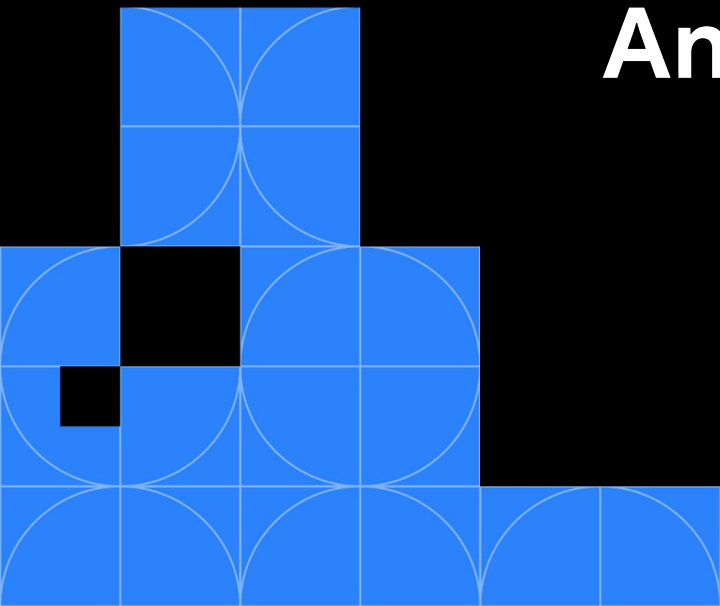
You can find the demo code and videos here!

```
Text(  
  'Simple Statement or URL',  
  style: TextStyle(  
    color: Colors.blue[200],  
  ),  
,  
,  
],  
/  
(  
ons.star,  
lor: Colors.blue[500],  
t Text('23'),
```

Keras_CV
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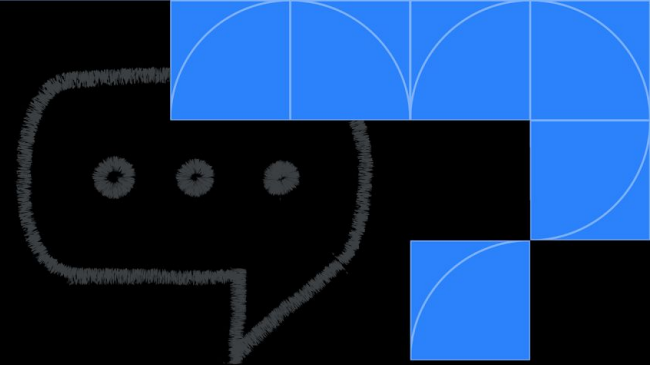


Any Questions?



```
Text(  
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,  
),  
],  
/  
(  
  ons.star,  
  lor: Colors.blue[500],  
  t Text('23'),
```

Keras_CV
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Thank you for tuning in!

