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SERIES

# Face detection demo

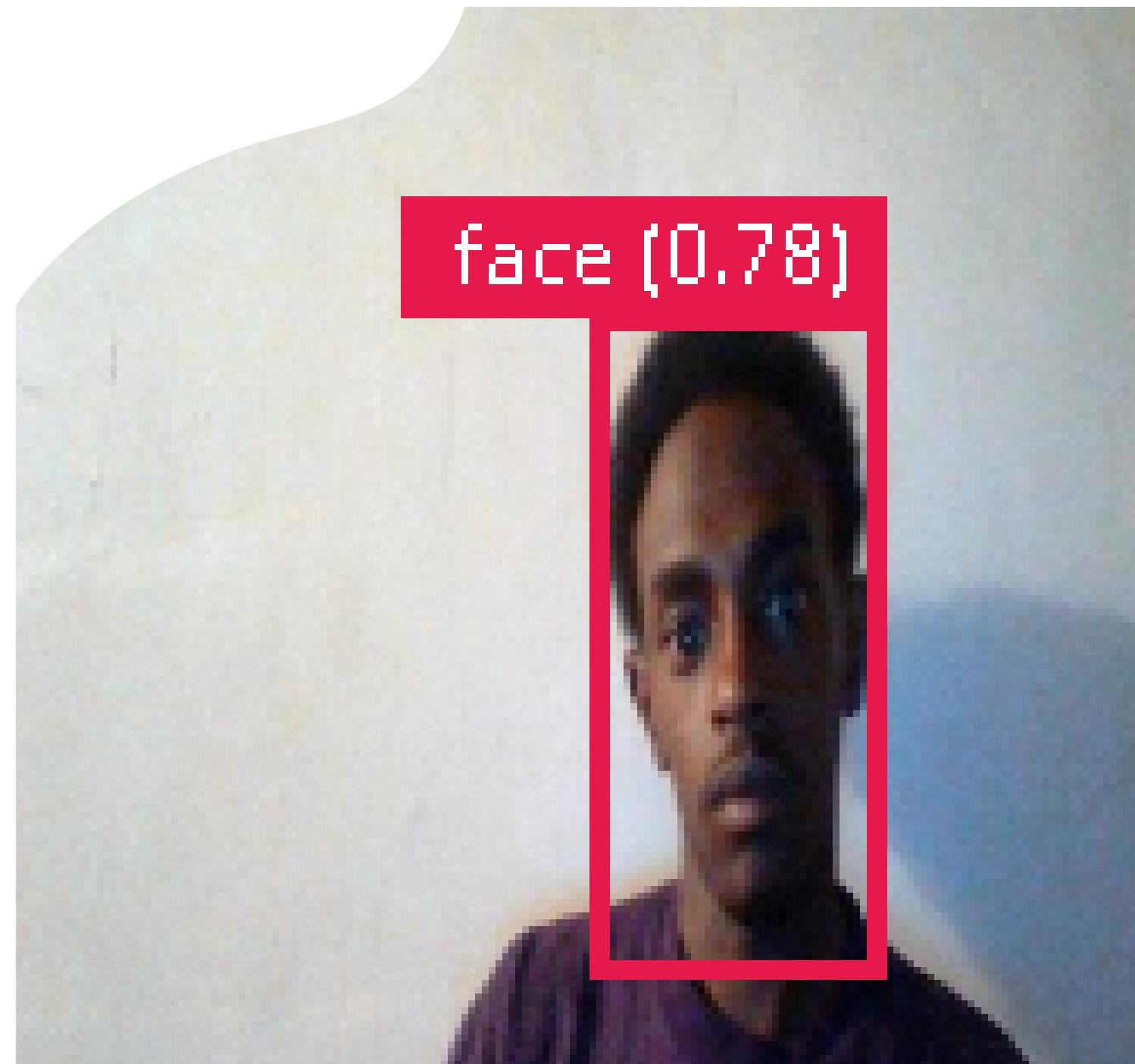


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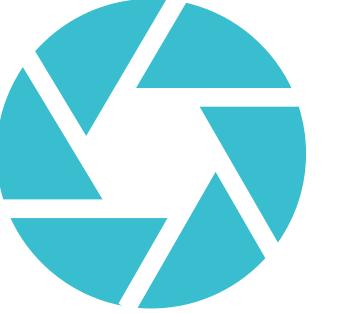
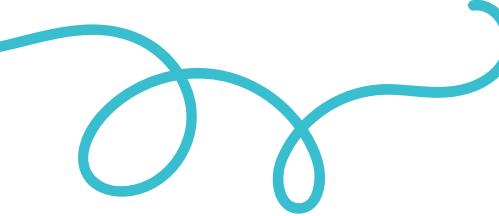


## What we will cover



1. Introduction to Computer Vision tasks
2. Application deep dive using the Edge Impulse platform:
  - (a) Data acquisition
  - (b) Impulse design
  - (c) Model testing
  - (d) Live classification
  - (e) Deployment
  - (f) Bring Your Own Model (BYOM)



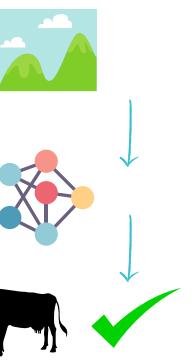


# Introduction to Computer Vision tasks

Computer Vision is a subset of computer science that enables computers to observe and understand what they see.

How does it work:

- 1) **get** an image
- 2) **process** the image and extract features (shapes, colors, patterns, edges, etc.)
- 3) **interpret** the image (compare the features with patterns and information it has learned).



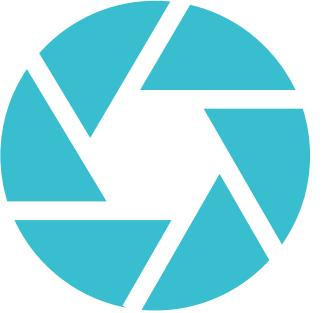
Main tasks:

- 1) **Image classification** - identifies the class to which an entire image belongs to
- 2) **Object detection** - identifies an object in an image as well as its spatial position
- 3) **Semantic segmentation** - identifies similar objects of the same class, at a pixel level.

Similar classed objects are colored the same way.

- 4) **Instance segmentation** - goes a step further than semantic segmentation and distinguishes between individual instances of objects.





# Main Computer Vision tasks

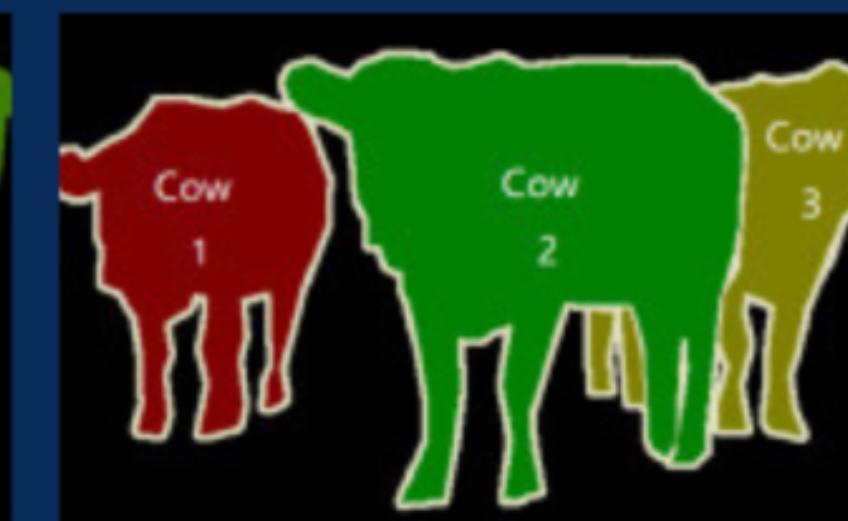


1. IMAGE CLASSIFICATION

2. OBJECT DETECTION



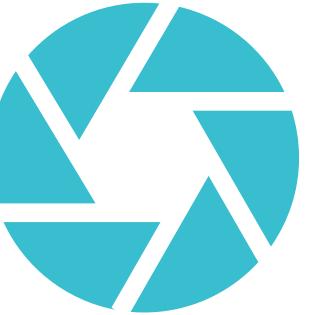
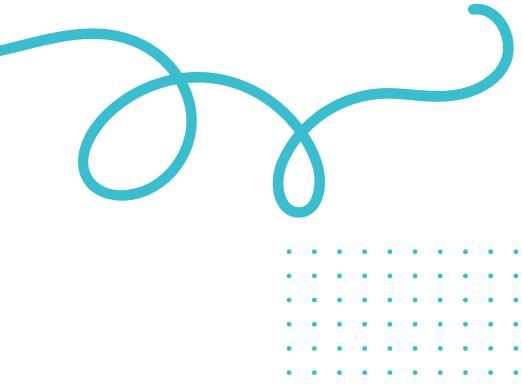
3. SEMANTIC SEGMENTATION



4. INSTANCE SEGMENTATION

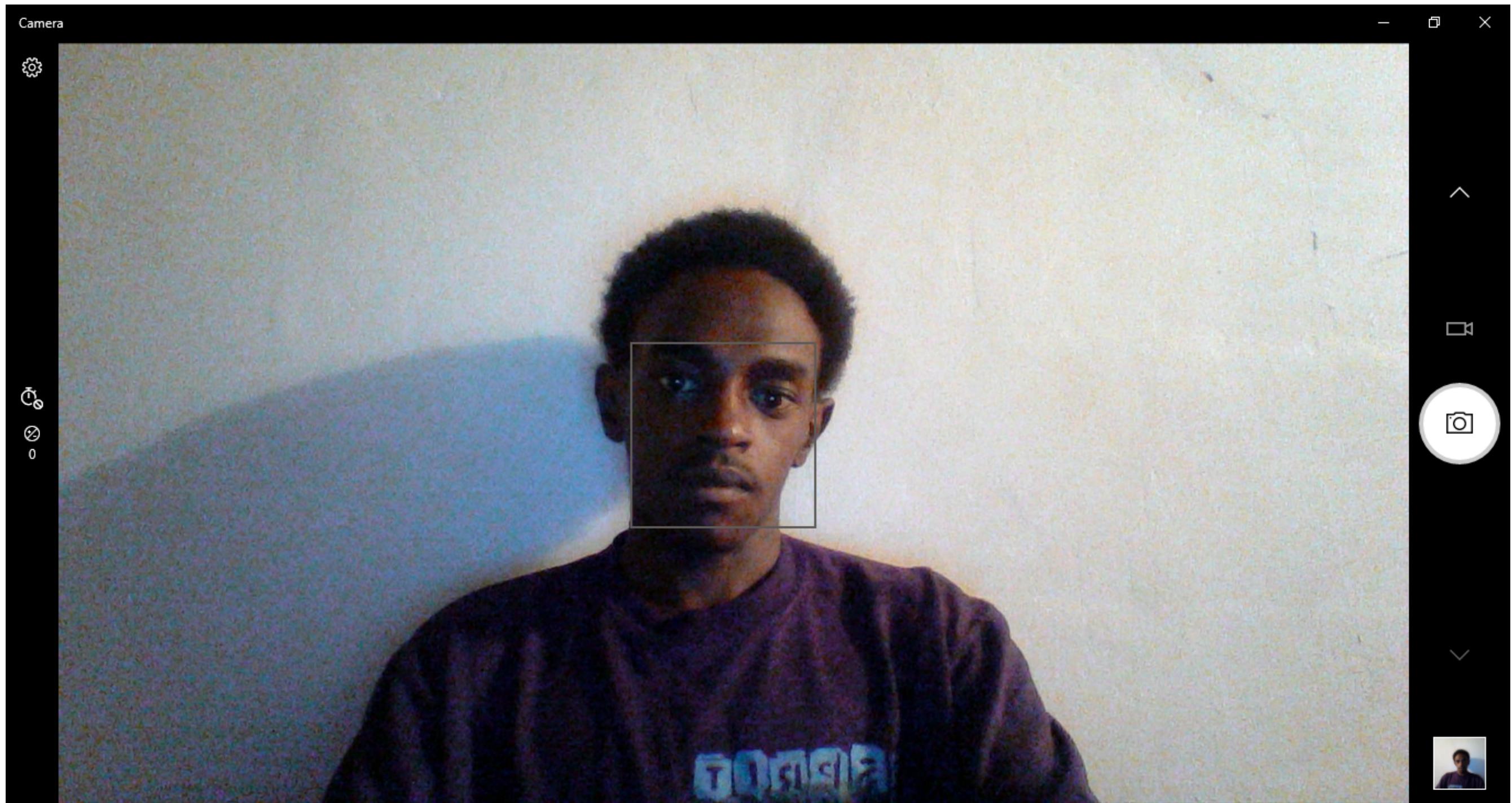
Credits: <https://www.smart-interaction.com/2022/07/14/computer-vision-the-ultimate-guide-on-the-4-main-tasks/#:~:text=The%20four%20main%20tasks%20of%20computer%20vision&text=The%20main%20tasks%20of%20computer,Semantic%20Segmentation%20and%20Instance%20Segmentation>

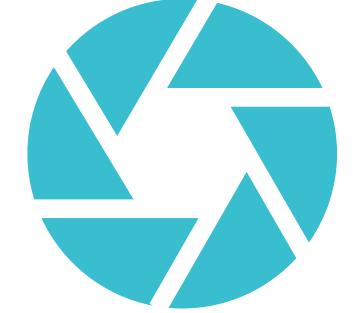
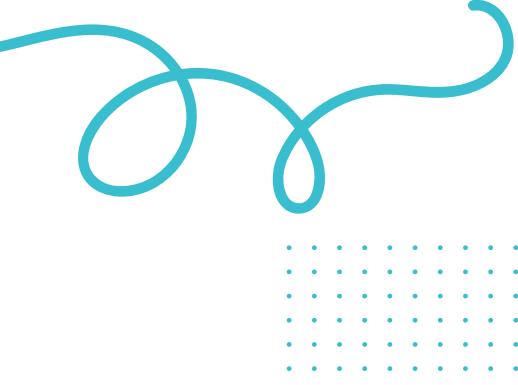




# Application deep dive

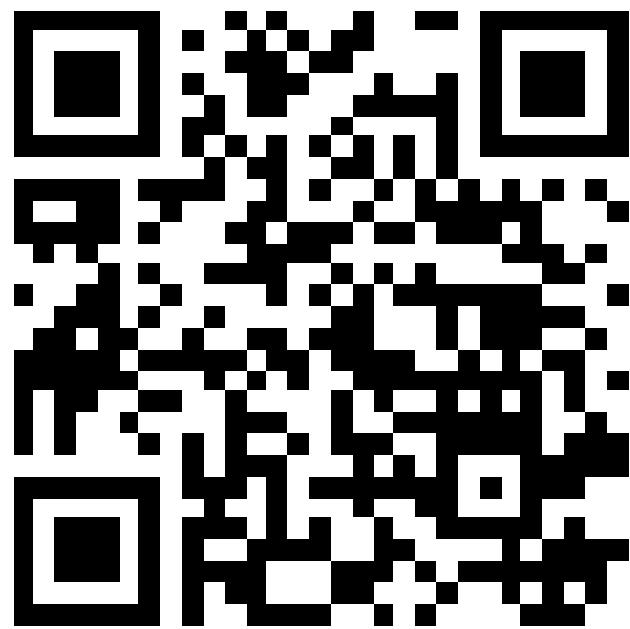
## Face detection





# Face detection demo project

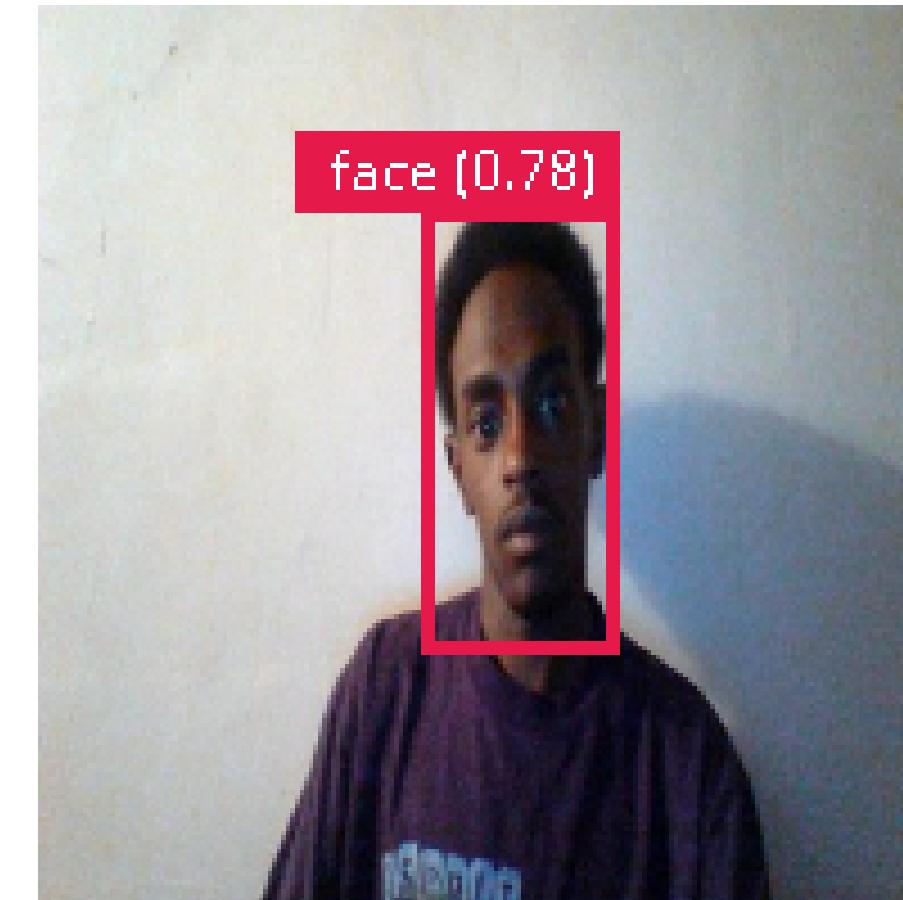
Clone the public Edge Impulse project:

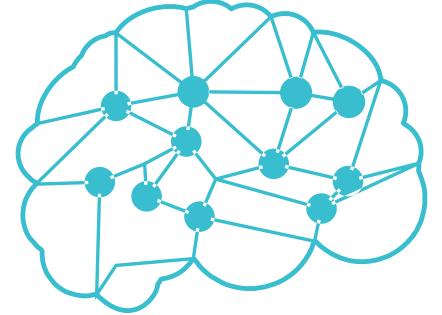
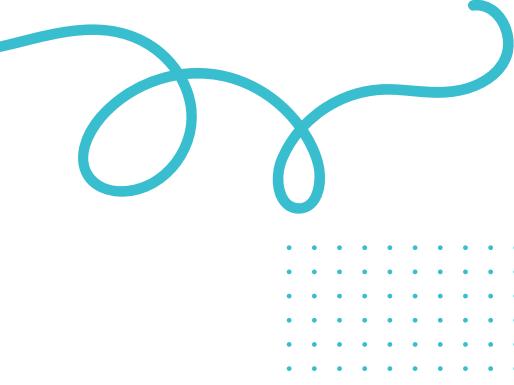


Scan me!  
[Link here](#)



Classification result





## Edge Impulse BYOM and Python SDK

Bring your own model (BYOM) allows you to upload your own model directly into your Edge Impulse project (TensorFlow SavedModel, ONNX, or TensorFlow Lite).

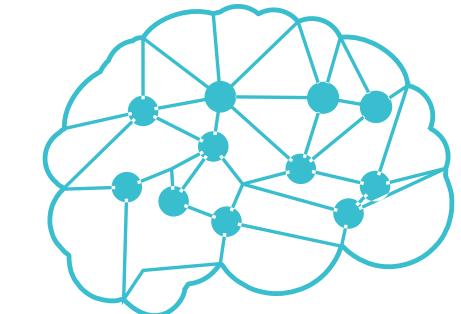
Key features of Edge Impulse's Python SDK:

- 1) Profile a deep learning model for inference on embedded hardware, with one line of code.
- 2) Deploy a deep learning model to a number of possible hardware targets



More information on BYOM here: <https://docs.edgeimpulse.com/docs/edge-impulse-studio/bring-your-own-model-byom>

More information on Edge Impulse Python SDK here: <https://edgeimpulse.com/blog/unveiling-the-new-edge-impulse-python-sdk>



# Thank You

**Solomon Muhunyo Githu**



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