

# Object Detection via Smartphone

## Detection of Forbidden and Dangerous Objects

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### Goal

The security of people in indoor environments, such as nightclubs or concert halls, is a highly important matter. However, human personnel cannot always fully prevent any potential threats. The goal of this project is to develop a mobile application that facilitates real-time recognition of forbidden or dangerous objects in indoor environments (e.g. knives, scissors, lighters, alcohol,...).

### Methodology

Nowadays deep neural networks are becoming more and more powerful and they are one of the main reasons behind the fast advancement in the field of computer vision. Most recent neural networks can yield incredibly high accuracy while reducing the size of the model, which makes them suitable for applications on mobile devices that are limited in terms of processing power and storage. The approach that this project will use is YOLOv7 [1], a fast and accurate object detection architecture.

### Expected Results and Finishing Criteria

The expected outcome of the project is an app that can run in real-time on mobile devices, which means ideally supporting between 30 and 60 FPS. The model should ideally reach at least 80% classification accuracy and 25-30% mAP score for the bounding boxes.

### Timeline

Table 1 that shows the approximate expected timeline of the project stages.

Milestone	Deadline
Dataset Collection	01.12.2023
Model Training	15.12.2023
Application Development	05.01.2023
Evaluation	15.01.2023

Table 1: Milestones

### References

- [1] Chien-Yao Wang, Alexey Bochkovskiy, and Hong-Yuan Mark Liao. Yolov7: Trainable bag-of-freebies sets new state-of-the-art for real-time object detectors, 2022.