

# Object Detection and Object Classification in the browser

Graduate



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**Initial Situation:** Despite the increasing number of cameras installed in all types of mobile devices, the devices are still "blind" in the sense that they do not know what the images contain. Only with the help of object detection and object classification based on neural networks can the devices develop a simple form of "scene understanding". The big challenge is to be able to run neural networks efficiently on mobile devices, ideally in a manufacturer-independent runtime environment. This work is about examining the current state of the art regarding the inference of neural networks for object detection and object classification in modern web browsers on various platforms.

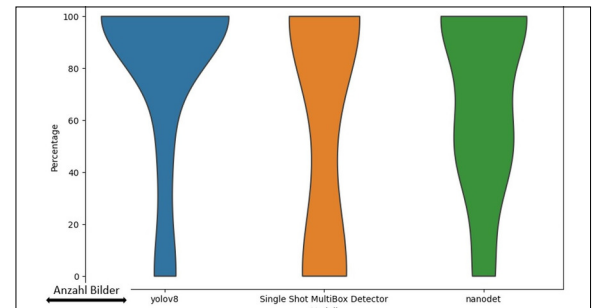
**Approach / Technology:** Three widely used models (YOLOv8, Nanodet, Single Shot MultiBox Detector) were implemented on a specially created website. The website contains predefined series of images on which object detection/classification is carried out, collecting the detection accuracy, inference time, resolution, device type and other data. The same four series of images were tested on four different devices and for each model.

**Result:** The three inference engines could be compared with each other and the strengths and weaknesses of them became clear. One inference engine is characterized by high recognition accuracy, another is the right choice if solid recognition accuracy and a short time for object detection and object classification are desired. The influence of different performance devices on which object recognition and object classification were carried out on the recognition accuracy and the time required was also examined.

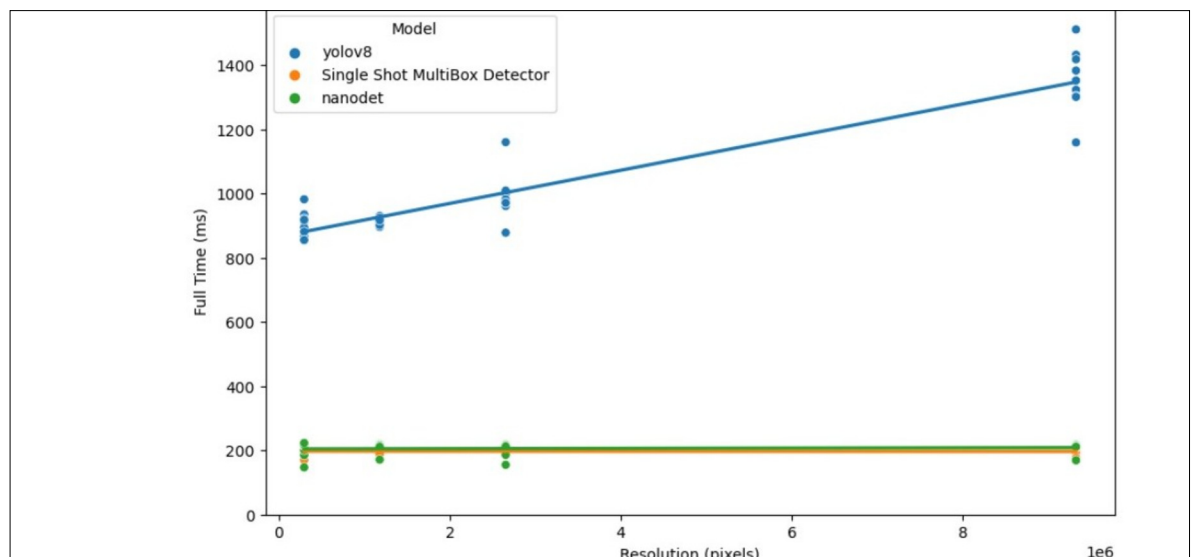
Nanodet Object Detection and Object Classification  
Own presentation



Recognition Accuracy Realme RMX1931  
Own presentation



Resolution - Full Time Ipad mini 2  
Own presentation



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