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Object Recognition based on Deep Learning Algorithms using Embedded IoT with Interactive Interface

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Abstract:
Object detection is one of the most popular applications of machine learning in the modern era. With the growth of IOT in recent times, dedicated devices offering real-time object detection have seen overwhelming demand and applications in many sectors e.g. security, healthcare, workplace etc. Different algorithms and approaches have been implemented and studied in terms of object detection. To refer to a few the YOLO family, RCNN family, SSD etc. This research study compares the performance of YOLO and Faster RCNN based on a custom dataset containing different objects and items. The IOU of each data point (image) is calculated and compared. YOLO performs better for a small margin. In this research study, a language learning interactive model is demonstrated based on object detection(YOLO), NLP, python, flask and IoT (Raspberry Pi.) The web application is running on is divided into two parts, learning and practice. The learning part has a raspberry pi device which has a camera module that captures real-time footage, recognizes the object and reads out its name in the language the user is learning. The practice has the same setup, with the application asking the user to show a particular object. Points are awarded for correct guesses, making the learning process more interactive and involving.

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