Real-Time Sign Language Detection

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Application of Machine Learning in Mechatronic Systems

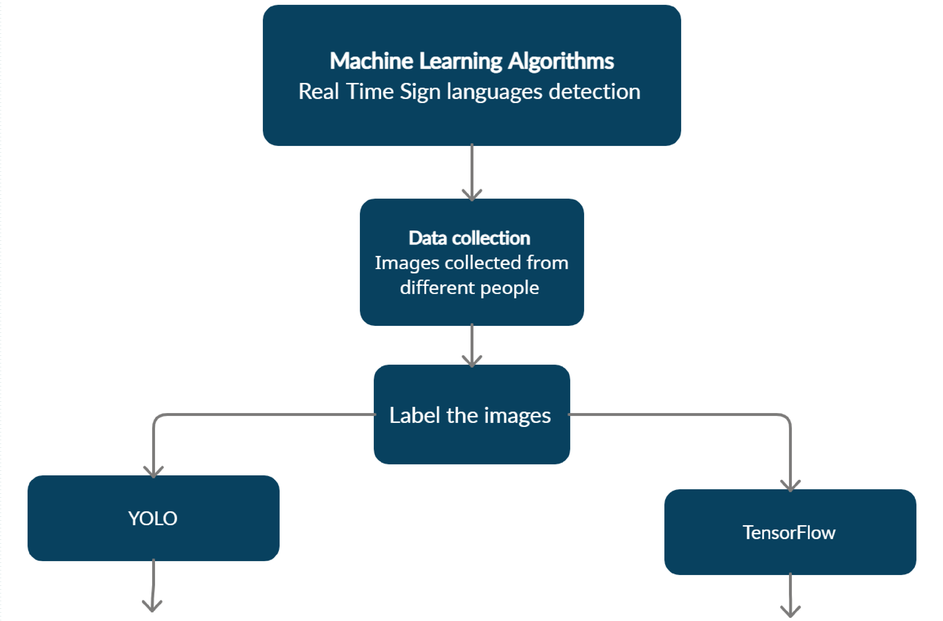
Introduction

Modern day applications of machine learning are vast in the field of audio classification however the same cannot be said for sign language recognition. Today, computers and cellphones make the possibility of employing real time hand sign recognition a reality. Our aim is to rollout a sign language recognition model with a singular database that can be used in various applications.

Materials and methods

- We collected our own data by taking multiple pictures from four people that amounted to 500 images.
- Each API was allocated a random collection of samples.
- Used two API: TensorFlow (group of CNNs) and YOLO (Single CNN) which were used to train two different models.
- Yolo model was compiled and then deployed on a Raspberry Pi 4 using the Pi Camera where real time sign language input was sampled and then processed into the yolo weights.

Results



Conclusions

The demonstration of real time object detection on a Raspberry Pi 4 indicates that localized hardware can be used to support this computationally expensive process. This can open up the industry to applications such as a Google Home for handicapped people that recognizes sign language in a quasi manner to speech recognition.

References

[1]J. Redmon, *YOLO: Real-Time Object Detection.*

[2]jakkcoder/training_yolo_custom_object_detection_files", *GitHub*,

[3]nicknochnack/TFODCourse", *GitHub*,

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Further Information

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