Blind’s Eye : IoT based real-time surrounding identification and object detection

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CONTENTS

PROBLEM

Fig. 1. A visually impaired person crossing street. [1]

- There are 285 million people in the world who are visually impaired of whom 39 million are blind [2].
- They can not do most useful jobs in human life like walking, crossing roads, roaming around their own house, etc. without the help of someone else.

INTRODUCTION

- If the user gets necessary information in real time, he can take immediate necessary steps like other normal human beings.

- For example, if the user is crossing a road and he gets the information that a car is approaching to him with 40 miles/hr, he can either move left or right to save himself.

Fig. 2. A man with a futuristic look with glasses augmented reality in holography. (3)

APPROACH

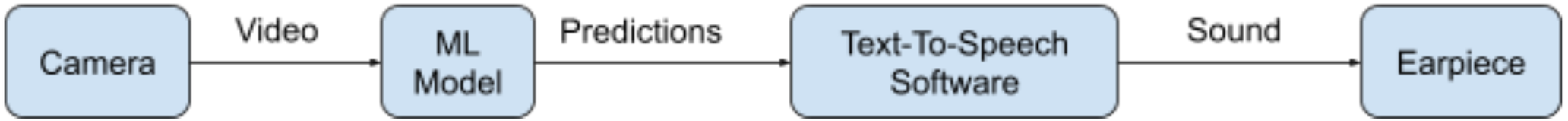

Fig. 3. A block diagram showing the process for providing surrounding information to the user.

ML MODEL

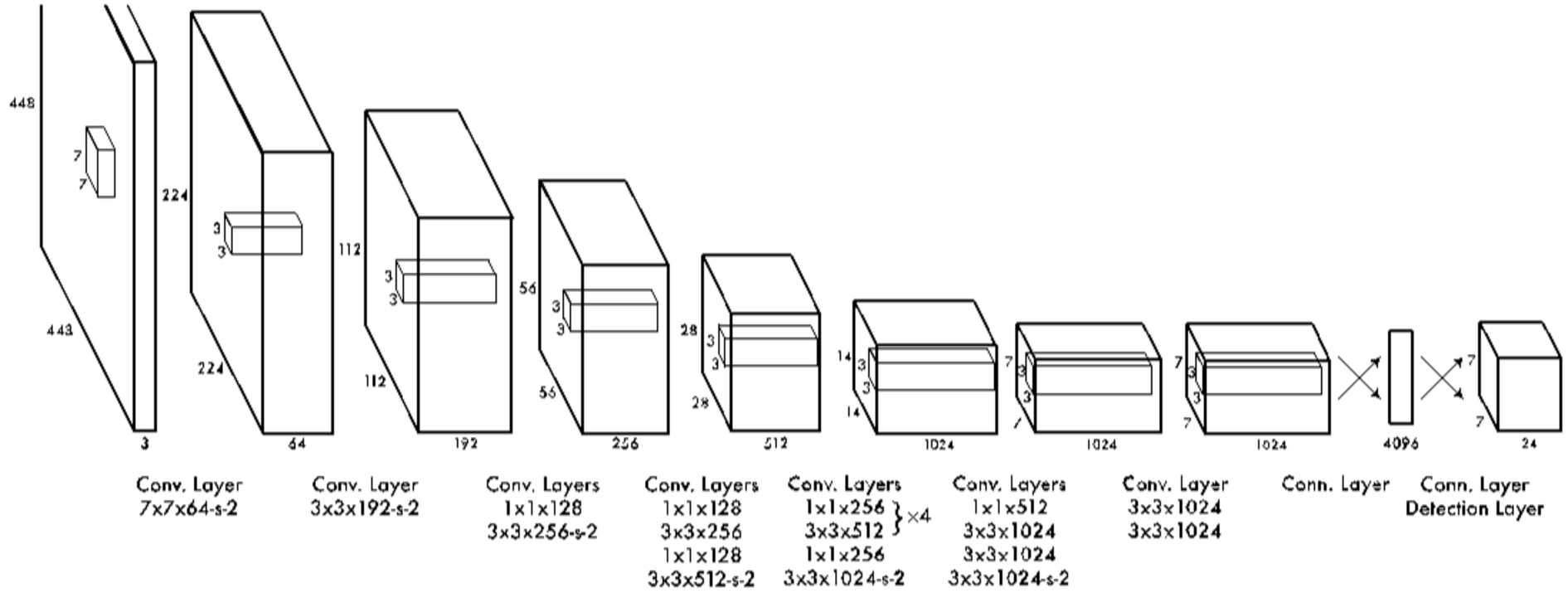

Fig. 4. Diagram shows the layers of the network (4)

The architecture of the network is a series of convolutional layers followed by fully connected layers.

CODE SNIPPET

```
#Extracting features to detect objects

blob=cv2.dnn.blobFromImage(img,0.00392,(416,416),
(0,0,0),True,crop=False)
                                                    #Inverting
blue with red
                                                    #bgr->rgb

#We need to pass the img_blob to the algorithm

net.setInput(blob)
outs=net.forward(output_layers)

#print(outs)
```

SECURITY

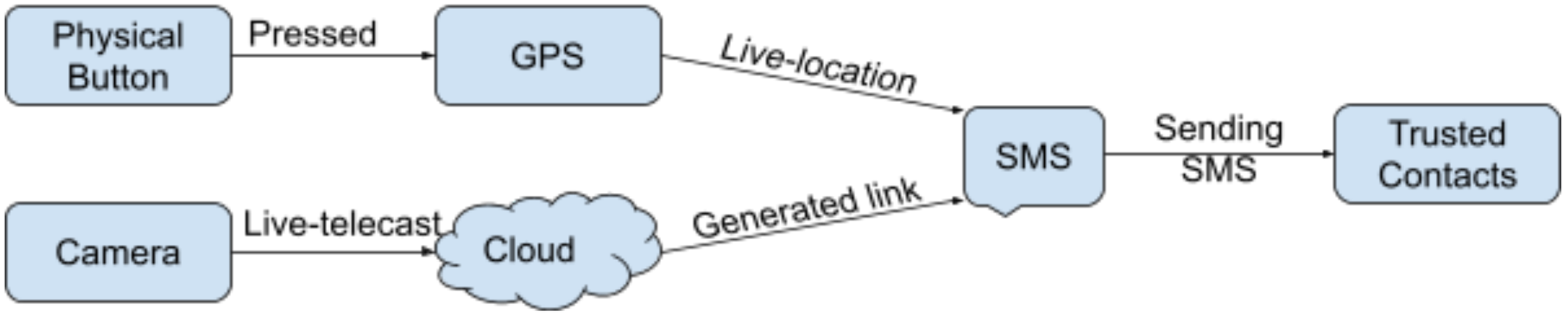

Fig. 5. A block diagram depicting security aspect imbedded in the device

OUTPUT

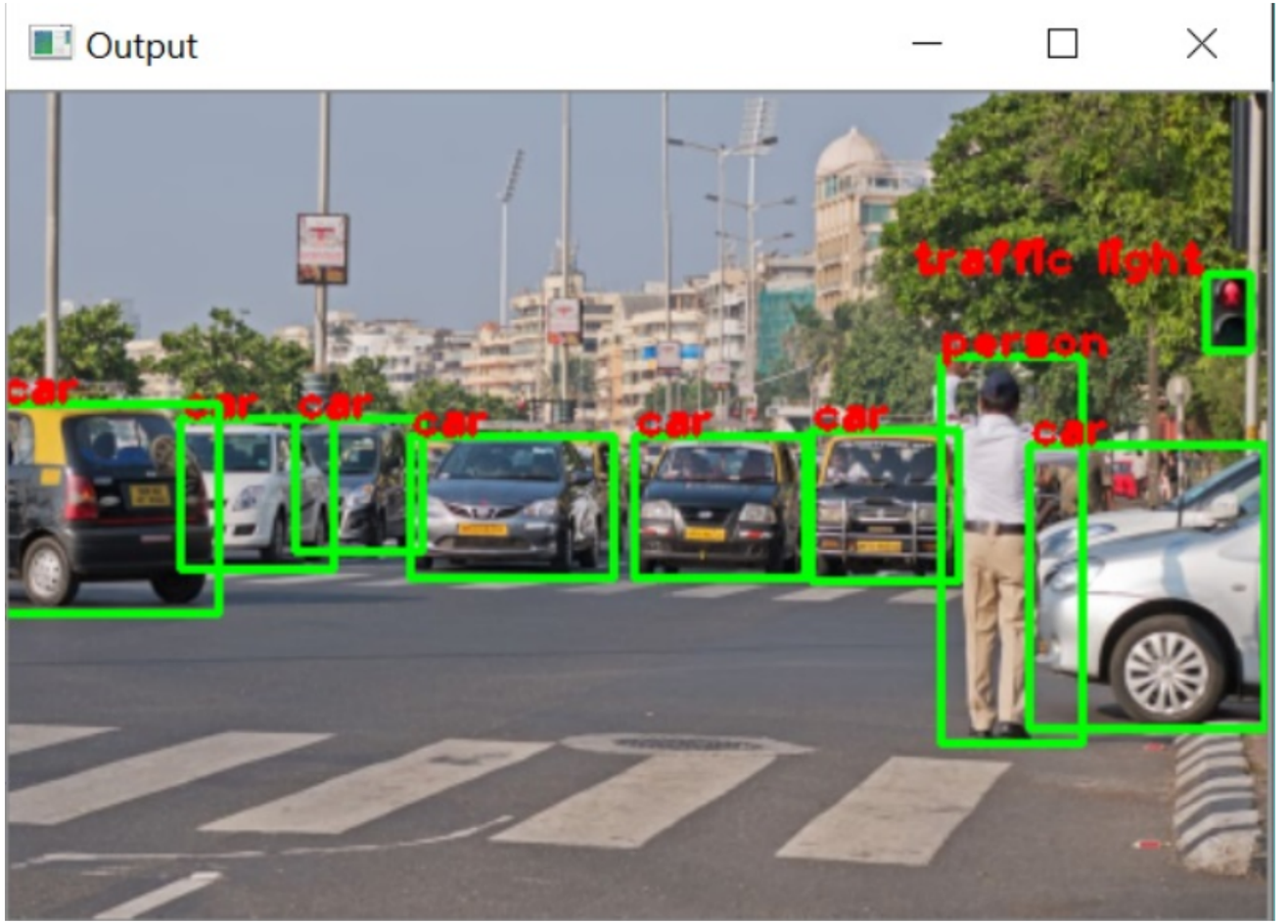

Fig. 6. Intermediary output of the model

STATUS

1. Need to implement hardware for making system portable.
   Plan of Action : Raspberry Pi 3 with Raspbian or Noobs.

2. Need to implement for a varied dataset
   Plan of Action : Gather More dataset.

3. Use of CNN with more neurons instead of Open CV
   Plan of Action : Modify existing Algorithm

REFERENCES

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(2) Pascolini D, Mariotti SPM. Global estimates of visual impairment: 2010. British Journal Ophthalmology Online First published December 1, 2011 as 10.1136/ bjophthalmol-2011-300539.

(3) HQUALITY. A man with a futuristic look with glasses augmented reality in holography. Adobe Stock. (n.d.). FILE #: 145565083. https://stock.adobe.com/in/search?k=futuristic+glasses. [Last accessed on: Jun. 5, 2021]

(4) Redmon, Joseph, et al. "You only look once: Unified, real-time object detection." *Proceedings of the IEEE conference on computer vision and pattern recognition*. 2016. [Last accessed on: Jun. 6, 2021]

THANK YOU !