NANYANG TECHNOLOGICAL UNIVERSITY

URECA
Undergraduate Research Experience on CAmpus

Category: 04
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Project ID: U15033

OBJECT DETECTION ON ANDROID SMARTPHONES

INTRODUCTION

BMW@NTU is an innovative research cooperation. The new BMW electric vehicles i3 and i8 are used to collect and analyze vehicle and traffic related data. The vehicles are equipped with a smartphone to acquire images of the area in front of the vehicle. These images will be used to detect objects, like pedestrians in the driveway of the vehicle. The objective of this project is to build an application that can process images and detect and classify pedestrians in real driving situations.

METHODOLOGY

The tasks include:

IMPLEMENTATION OF HISTOGRAM OF ORIENTED GRADIENTS (HOG) ALGORITHM → TRAINING OF SUPPORT VECTOR MACHINE (SVM) → BUILD UI AND INTEGRATE PROGRAM INTO ANDROID DEVICE → EVALUATION IN TERMS OF PERFORMANCE AND RUNTIME

USED TO DERIVE A DESCRIPTION OF THE IMAGE

USED TO TRAIN FROM EXISTING DATA AND CLASSIFY NEW IMAGES

TESTING OF THE ALGORITHM BY SELF-TAKEN IMAGES BY THE SMARTPHONE REAR CAMERA

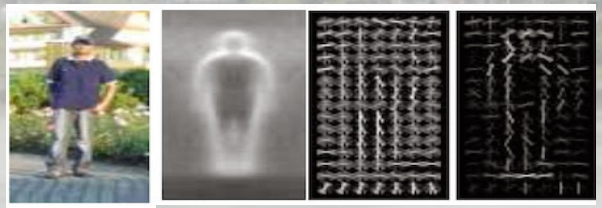

Figure : HOG detectors cue mainly on silhouette contours (especially the head, shoulders and feet).

FUTURE WORK

The software can be used to support the driver to enhance the traffic safety in Singapore and elaborate other security software aspects.

Project Title: Object Detection on Android Smart Phones
Supervisor: Vg Assoc Prof Felix Klanner
Co-Supervisor*/Collaborator*: Alexander Hanel