Real-time object recognition using Raspberry Pi with Neural Compute Stick 2

# **Introduction**

Real-time object recognition is the most popular application, It is tested and every hardware including Jetson, Coral, etc. Which differs on every hardware based on the Frame rate. Since it requires more computational power to classify every object from the video frame. This project works on Raspberry pi, but performance is accelerated using Intel Movidius Neural Compute Stick 2 with the help of OpenVino to run the deep learning application in Raspberry Pi with high frame rate.

# Abstract

This experiment has Raspberry Pi as the core, it doesn’t have enough computational power to process the frame in real-time and to recognize the object at fast. SO to accelerate the frame rate with high computational power, Intel’s Neural compute stick is used, which makes the application more efficient by processing every process from NCS instead of processing in Raspberry Pi. It leads to detect the Object from the real-time video.

# Existing system

In the existing system, Only Raspberry Pi is used, which classifies the object at a very slow rate.

# Proposed System

In this proposed system, this project uses Neural compute stick 2, which takes the whole computational process makes the application to be real-time with more efficient with the high frame rate.

# Connection Description

Raspberry Pi is the core of this project, USB camera is interfaced with the Raspberry Pi. Neural Compute Stick 2 is also USB Interfaceable. It also plugged in the Raspberry Pi USB port before running the program.

# Project Description

This project is capable of performing the real-time application, even there is multiple objects, this system is capable of classifying the object and forms the boundary boxes to represent that is object with its accuracy. Its frame rate is very high. It uses Neural Compute Stick 2, which has high performance than Movidius. NCS can be interfaced with windows 10 or Linux operating system, by running OpenVino as backend. In the Raspberry, Pi OpenVino is installed and runs at the background to interface and share the computational process in the name of MYRIAD device.

# **Hardware Required**

* Raspberry Pi
* Intel Movidius Neural Compute Stick 2
* USB Camera

# **Software Required**

* + Raspbian OS with libraries installed
  + OpenView library
  + SD Card Formatter
  + Etcher

# Result

Results are remarkable since its frame rate is more when running the same application in Raspberry Pi without Neural Compute Stick 2.