Facial Mask Presence Detection
ARTIFICIAL INTELLIGENCE

Due to the current pandemic scenario, it is mandatory to wear a facial mask in crowded places to reduce the spread of the COVID-19 virus. Tessolve's Facial Mask Presence Detection (hereafter referred to as FMPD) is a recommended choice in this scenario since it runs on the Edge platform has a very quick response and is a very low-cost application

Tessolve's FMPD is an AI-based use-case to classify whether a person is wearing a facial mask or not. Person image captured through an RGB sensor connected to Tessolve's demo kit shall be processed by a pre-trained AI model running on NPU and classifies whether a person is wearing a mask or not. The corresponding output shall be displayed along with inference time & FPS on the LCD screen connected to the demo kit.

Tessolve's FMPD application shall be used in the following application use cases such as,

▢⇨ Detecting facial masks inside hospitals, schools, public places, etc.,

▢⇨ This shall be extended to detect the temperature and facial recognition. If the temperature is abnormal, restrict the person entering premises to prevent Covid spread, etc.

FMPD demo kit details:

▢⇨ FMPD demo kit is equipped with an ARM Cortex-M4 microcontroller (STM32H747XIH6).

▢⇨ FMPD demo kit is equipped with various IO interfaces that allow the user to build and test their end application solutions before productizing the concept

▢⇨ Ready-to-go software package Linux Optimized BSP. Custom applications and software packages can be offered on request.

The demo kit takes the leverage of Tessolve's outstanding expertise in multimedia and embedded control technologies. This expertise enables a market-leading system performance One key value of Tessolve's system solutions is the ready-to-go software package described above.

FMPD demo kit Operation

▢⇨ A custom AI model is trained using the custom dataset to predict the following scenes,

- ■ **Facial mask presence**   ■ **Facial mask absence**

▢⇨ The model then shall be flashed onto the demo kit

▢⇨ Once the demo kit is powered on through a 5V standard power supply, the model has been flashed successfully. A welcome screen will pop up on the LCD and camera view shall be visible

▢⇨ The user needs to stand in front of the camera and put the face mask ON/OFF. The model predicts the action and displays it on the LCD screen with confidence and inference time

FMPD Demo Screenshots

For demo kit, Linux is the standard offering but versions for RTOS are available on request

Technical Information	Demo kit
Video Output	x1 LCD Out (24bits RGB)
Ethernet	x1 10/100/1000 Mbps RJ45 Ethernet Connectors
USB Host	x1 10/100/1000 Mbps Type A connector
Analog Audio	Microphone ON Headphone OUT Line OUT
Serial	x1 RS232 x1 UART
SDIO	Micro SD card support (SDXC)
Power Input	Standard 5V Adaptor Input
Temperature Range	Commercial
RoHS	The hardware is RoHS complaint

FMPD demo kit Architecture diagram
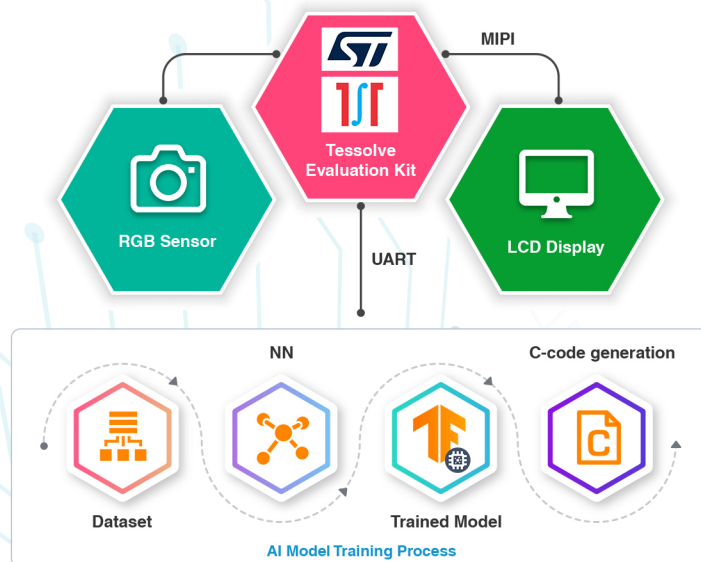
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