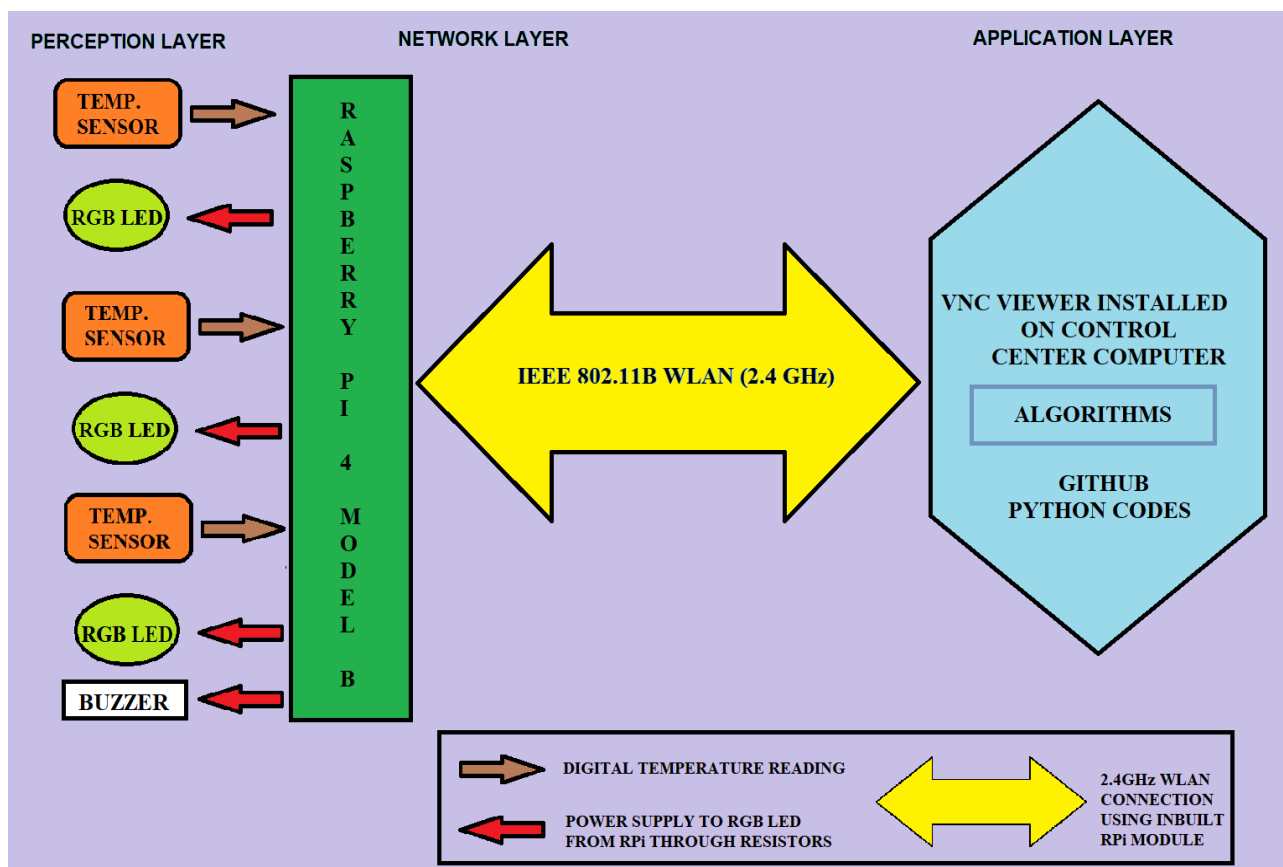# Assignment 1

IoT Based Fire Identification System For Trains

Three Layer IoT Architecture

- Perception Layer: Temperature sensors, RGB Light Emitting Diodes, Buzzer.

- Network Layer: Raspberry Pi 4 Model B with inbuilt 2.4GHz IEEE 802.11b WLAN.

- Application Layer: VNC Viewer installed on control center computer as user interface with required algorithms.

Block diagram: IoT based Fire Identification System for Trains

In the block diagram above, a three layer IoT architecture for Fire Identification System for Trains is proposed. The train is considered to have three bogies for the purpose of this demonstration. Each bogie will be fitted with a temperature sensor (DS18B20) and a common cathode RGB Light Emitting Diode (LED) which would serve as a visual warning system. The colour emitted would be corresponding to temperature bands recorded by the temperature sensor. A common buzzer is provided for audio warning.

All three of the above systems are connected to the Raspberry Pi microprocessor board. The Pi would be programmed with algorithms intended to cover all operating scenarios. A conceptual example is provided below:

if Tempinput> Tx1, do LED colour Y

if Tempinput>Tx2, do LED colour R, do buzzer

The Raspberry Pi 4 Model B has an inbuilt WLAN module capable of supporting IEEE 802.11b among other bands. This would be used to connect to a control computer. The user interface will be provided by VNC Viewer along with GitHub hosting the Python codes. This allows for easy access and edits to operational parameters. Sensor data can be stored within Raspberry Pi and transferred to the control centre computer whenever necessary. The system is reconfigurable with low power consumption and potential for greater scale in implementation.