VEHICLE DASHBOARD USING CAN AND IOT

TEAM MEMBERS

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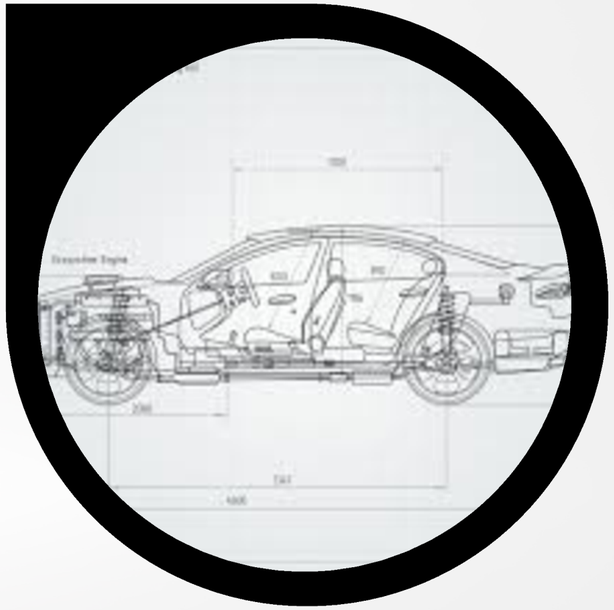
PROBLEM STATEMENT

- Traditional dashboards lack smart connectivity
- Limited visualization and no remote monitoring
- No integration of environmental awareness (AQI, humidity)
- Demand for real-time data access and cloud integration in vehicles



PROJECT OBJECTIVE

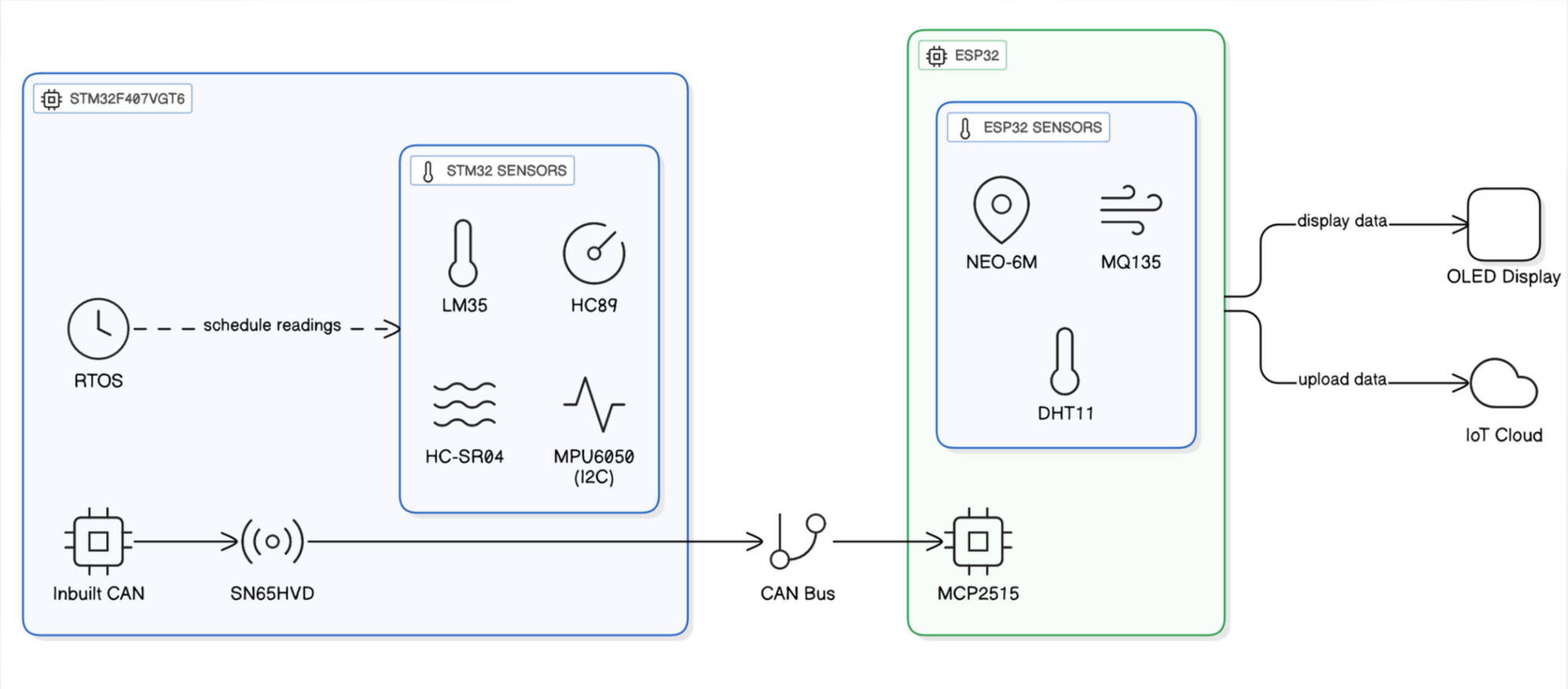
STM32, ESP32 with FreeRTOS powers modular, real-time acquisition of vehicle and environmental sensor data.

All telemetry is published to Blynk for seamless remote monitoring and control.

Data is synchronized via CAN bus and visualized on a dynamic OLED dashboard with alerts.

COMPONENTS USED

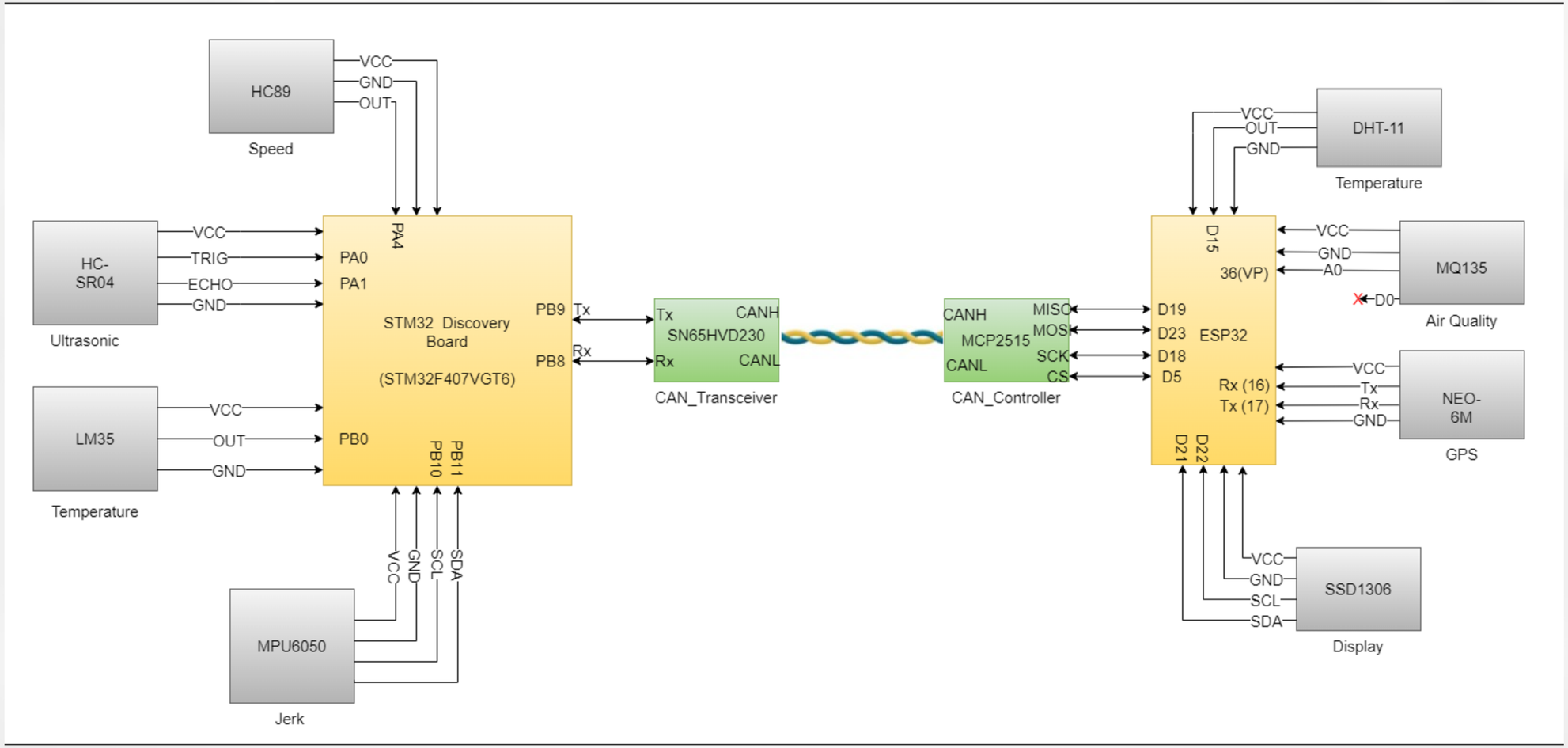
SYSTEM OVERVIEW DIAGRAM



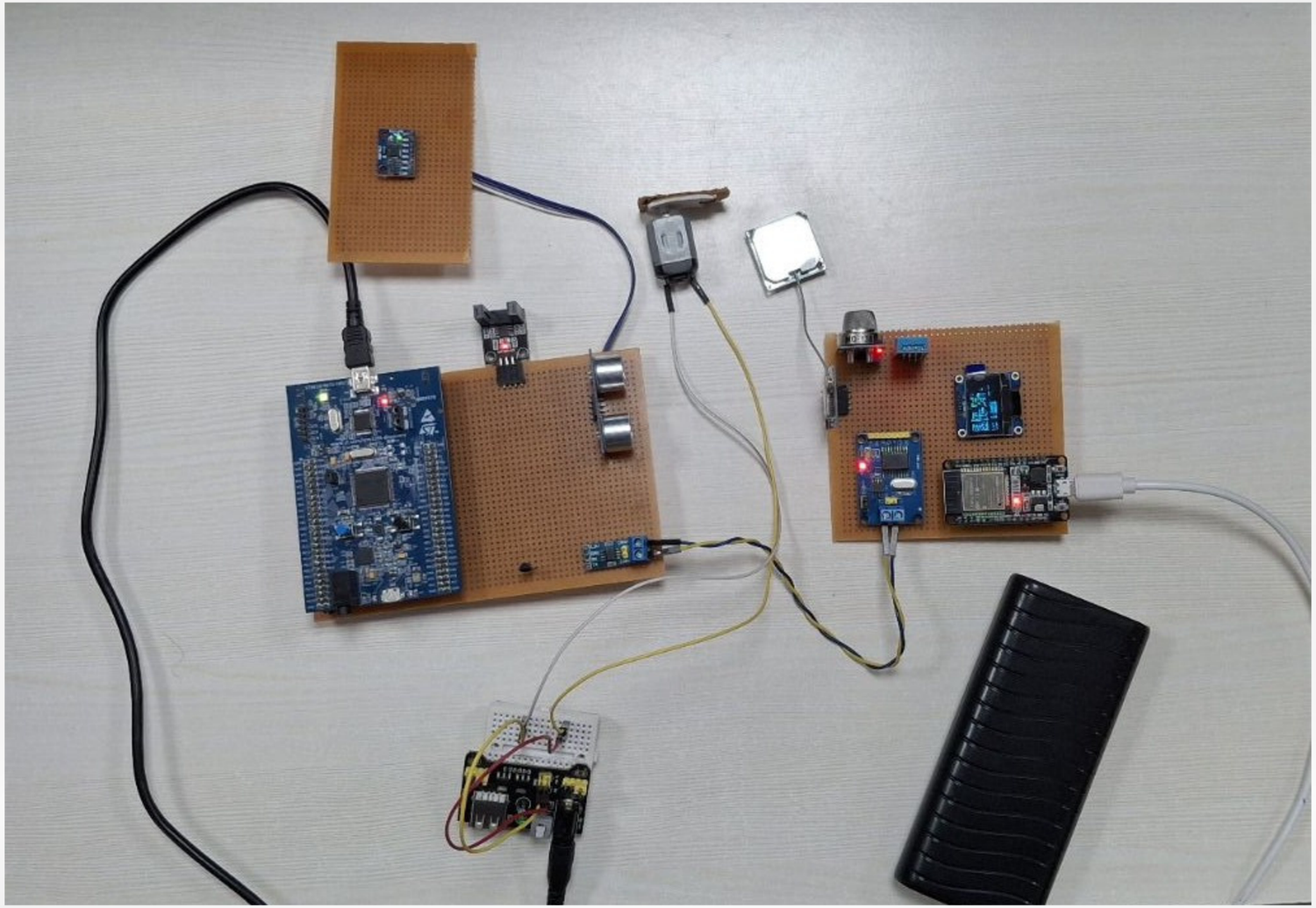
WORKING FLOW

1. Acquire Data for Engine Parameters using STM32
2. Send Data to ESP32 Using CAN
3. ESP32 Acquire Data from STM32 and using CAN simultaneously acquire data from Car Parameters
4. Display all Data on the OLED Display
5. Send All data onto cloud using WiFi

CIRCUIT DIAGRAM



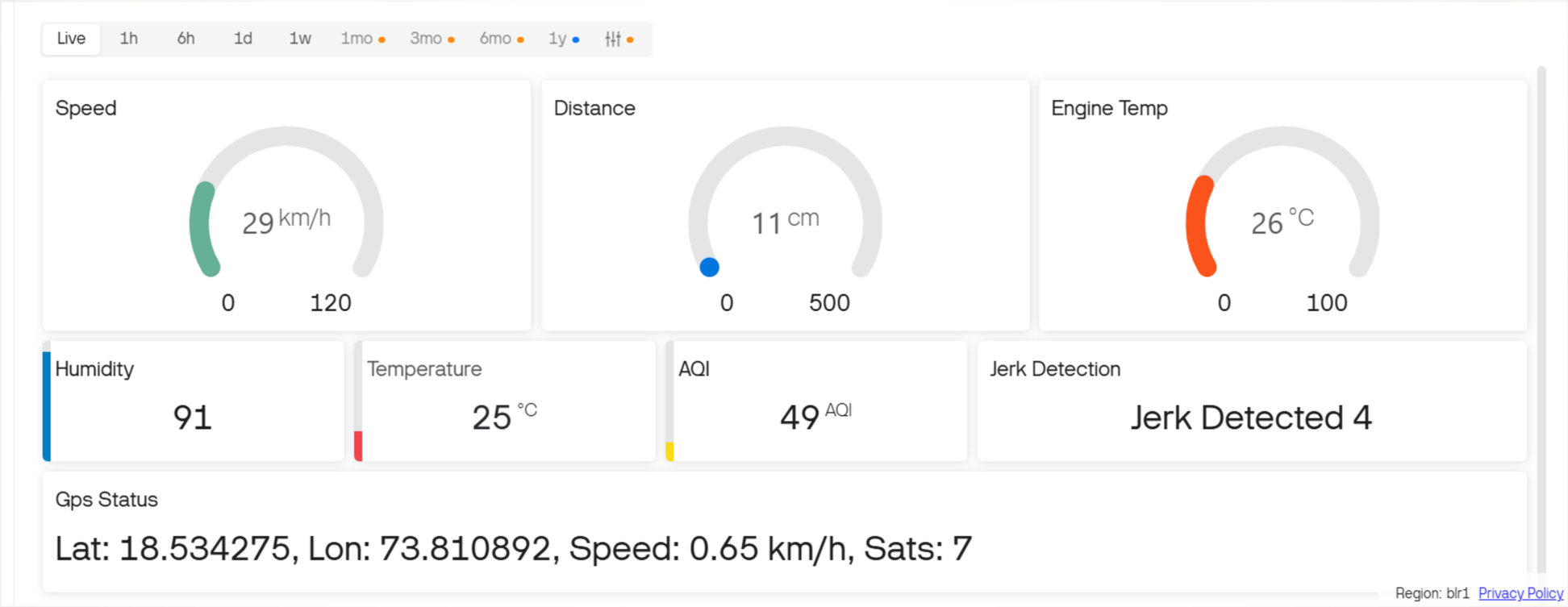
WORKING MODEL



TESTING & VALIDATION

```
23:31:26.721 -> CAN >> ID: 0x103 | Data: 0 0 0 0  | Speed: 0 KMH
23:31:26.788 -> CAN >> ID: 0x101 | Data: 23 0 0 0  | Dist: 35 cm
23:31:26.953 -> DHT11 >> Temp: 25.30 °C | Humidity: 57.80 %
23:31:27.583 -> CAN >> ID: 0x103 | Data: 0 0 0 0  | Speed: 0 KMH
23:31:27.782 -> CAN >> ID: 0x100 | Data: 1B 0 0 0  | Temp: 27 C
23:31:28.313 -> PM2.5 >> Raw ADC: 265 | Voltage: 0.214 V | PM2.5: 0.00 ug/m³
23:31:28.379 -> CAN >> ID: 0x101 | Data: 28 3 0 0  | Dist: 808 cm
23:31:28.446 -> CAN >> ID: 0x103 | Data: 0 0 0 0  | Speed: 0 KMH
23:31:28.910 -> Sent CAN data to Blynk
23:31:29.043 -> DHT11 >> Sensor read failed!
23:31:29.275 -> CAN >> ID: 0x103 | Data: 0 0 0 0  | Speed: 0 KMH
23:31:29.971 -> CAN >> ID: 0x101 | Data: 24 0 0 0  | Dist: 36 cm
23:31:30.137 -> CAN >> ID: 0x103 | Data: 0 0 0 0  | Speed: 0 KMH
23:31:30.303 -> PM2.5 >> Raw ADC: 231 | Voltage: 0.186 V | PM2.5: 0.00 ug/m³
23:31:30.999 -> CAN >> ID: 0x103 | Data: 0 0 0 0  | Speed: 0 KMH
23:31:31.066 -> DHT11 >> Temp: 25.40 °C | Humidity: 57.80 %
23:31:31.364 -> Sent CAN data to Blynk
23:31:31.597 -> CAN >> ID: 0x101 | Data: 25 0 0 0  | Dist: 37 cm
23:31:31.829 -> CAN >> ID: 0x103 | Data: 0 0 0 0  | Speed: 0 KMH
23:31:32.294 -> PM2.5 >> Raw ADC: 275 | Voltage: 0.222 V | PM2.5: 0.00 ug/m³
23:31:32.692 -> CAN >> ID: 0x103 | Data: 0 0 0 0  | Speed: 0 KMH
23:31:32.891 -> CAN >> ID: 0x100 | Data: 1B 0 0 0  | Temp: 27 C
23:31:33.090 -> DHT11 >> Temp: 25.40 °C | Humidity: 57.80 %
```

OUTPUT


Live
1h
6h
1d
1w
1mo
3mo
6mo
1y
Speed
29 km/h
0
120
Distance
11 cm
0
500
Engine Temp
26 °C
0
100
Humidity
91
Temperature
25 °C
AQI
49 AQI
Jerk Detection
Jerk Detected 4
Gps Status
Lat: 18.534275, Lon: 73.810892, Speed: 0.65 km/h, Sats: 7
Region: blr1
Privacy Policy

ADVANTAGES

- Real-time monitoring
- Cloud access from anywhere
- Low-power, compact design
- Modular and scalable
- Embedded + IoT + communication integration

APPLICATIONS

- Smart vehicle dashboards
- Academic prototypes
- Fleet tracking systems
- Pollution monitoring in traffic
- Vehicle diagnostics

FUTURE SCOPE

- Voice alert for warnings (overheating, pollution)
- Battery health monitoring
- Touch UI dashboard
- AI-based fault prediction using cloud data
- Integration with real vehicle (OBD to CAN)

CONCLUSION

- Embedded and cloud systems combined for smart vehicle interface
- Real-time data collected, visualized, and uploaded
- Opens gateway for next-gen automotive solutions
- Project gave hands-on in CAN, MQTT, IoT platforms

THANK YOU

https://github.com/GeniusGit4