AERIAL TRAFFIC MONITORING USING UAVS

TECHNOLOGY BUCKET: **Robotics & Drones**

CATEGORY: **Software**

COMPANY NAME: **MathWorks India Pvt Ltd**

PROBLEM CODE: **AG1**

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IDEA/SOLUTION/PROTOTYPE

Video from drone is fed as input to pre-trained model designed using OpenCV, CNN and KNN for clustering and counting objects. Object count(vehicles, pot holes) is mapped to GPS co-ordinates. A density map is created using this object count depending on GPS co-ordinates of drone at that time for pot holes, vehicles etc. Data from sensors like pollution sensor(MQ 135), humidity and temperature sensor(DHT 22), GPS module is sent using IoT(MQTT) to computer and visual graphs and charts are provided using Mat Lab. All the data is logged in a NoSQL database for feasibility and future use.

TECHNOLOGY STACK

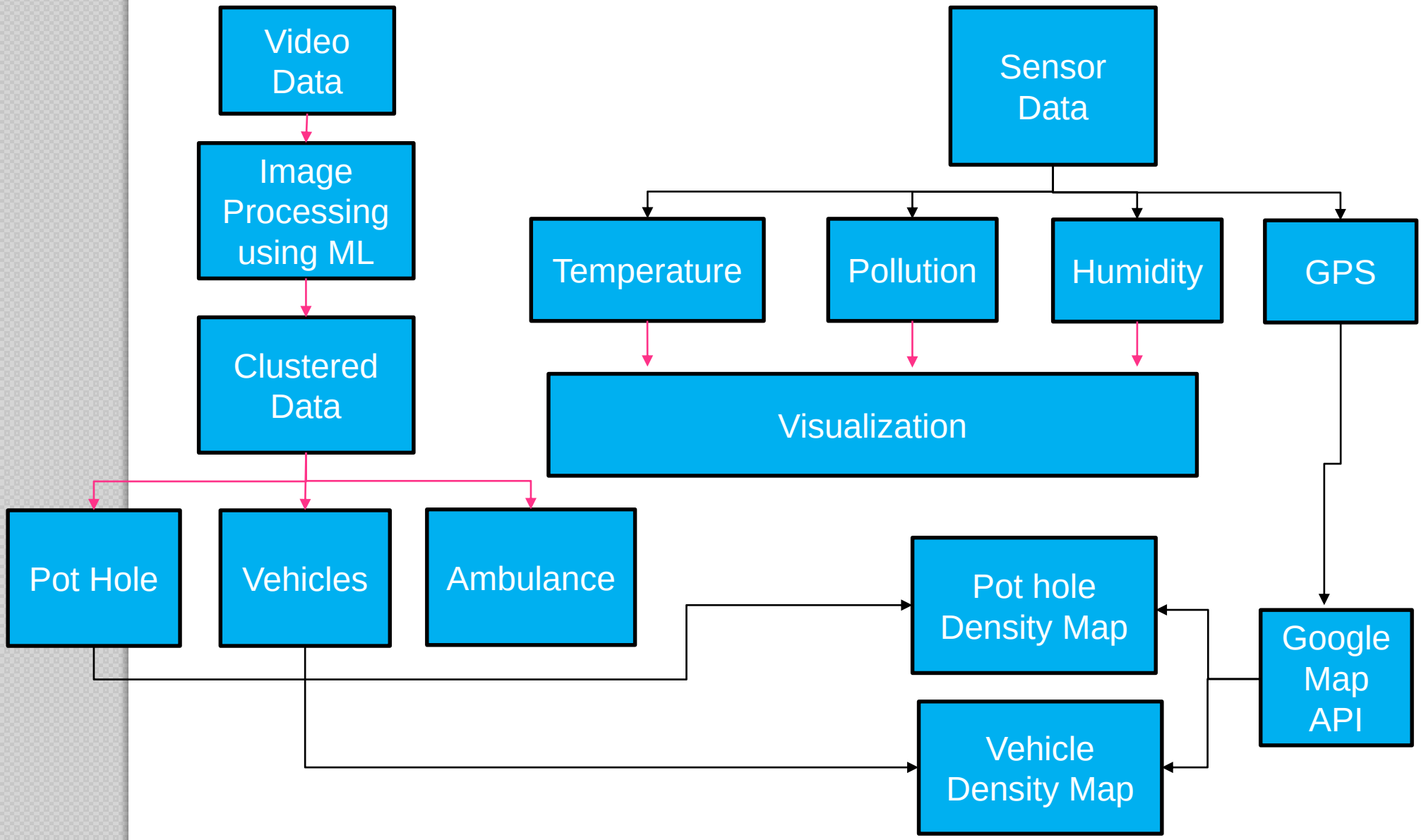
HARDWARE

- Dht22-Moisture and Humidity Sensor
- MQ-135-Air Quality Sensor
- GPS module
- RTC (Real Time Clock) Unit
- Quad band GSM/GPRS Module
- Microcontroller Unit(MCU)

SOFTWARE

- Mat lab
- Tensor flow API for Mat lab
- OpenCV
- Matplotlib Library
- NoSQL Database
- Google Map API

BLOCK DIAGRAM



- **All Data is logged in NoSQL Database for future use.**

USE CASES

- The processed data is used to predict the traffic density in a region and this information can be used for controlling the traffic flow at a junction by managing traffic lights based on the density. Further this data can even be used by ML and AI system for preventing various traffic problems.
- The sensor data collected can be used in taking necessary measures based on the Pollution levels in a region.
- If any emergency service vehicle is stuck in the traffic based on predictions of ML, it'll be forwarded to concerned authorities for taking appropriate actions.

Show Stopper/Dependencies

- Requires high quality surveillance video from drone for accurate processing of data.
- Internet connection is required for collecting IoT data from the sensors.