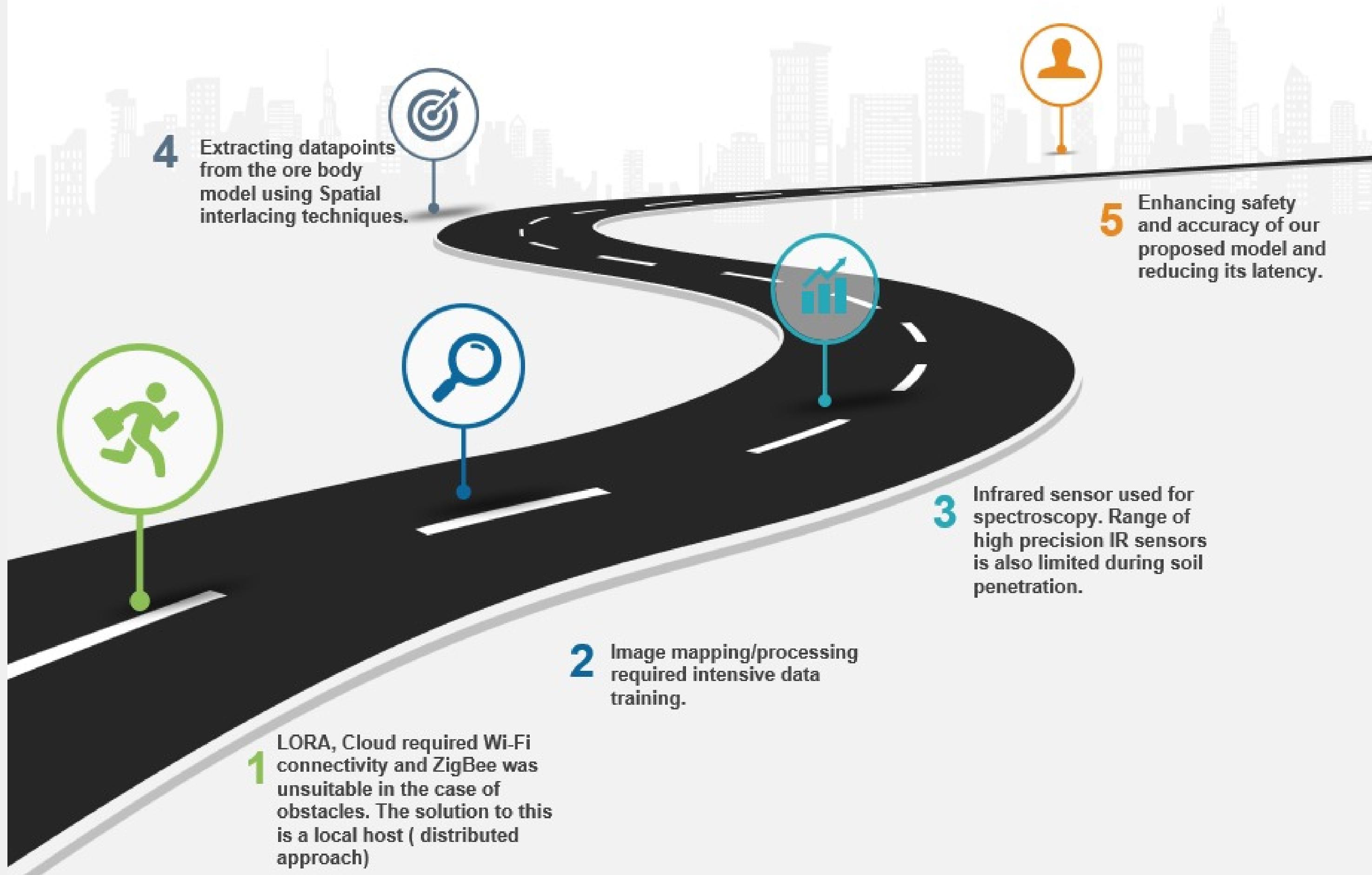
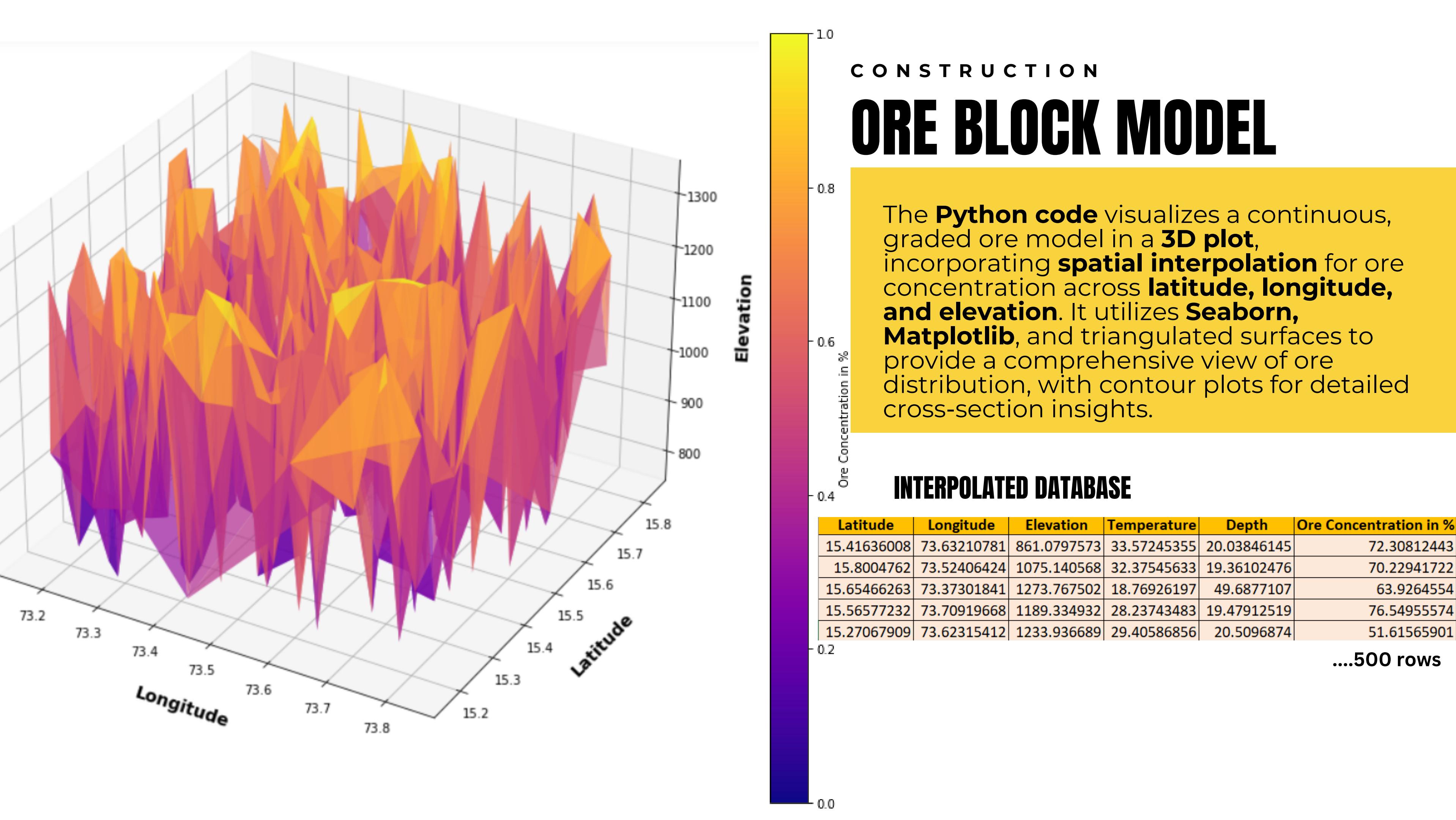
A large yellow dump truck is shown from a side-on perspective, driving along a grey asphalt road that cuts through a massive open-pit copper mine. The mine walls are steep and layered with various shades of brown, orange, and grey rock. The truck is carrying a load of reddish-brown ore. The sky is clear and blue.

**REAL TIME KNOWLEDGE OF  
ORE BEING MINED OUT**

**TEAM BYTEBENDERS**

# Roadmap





# Technology Stack

NEO 6M GPS MODULE

BMP280 BAROMETRIC PRESSURE SENSOR

RASPBERRY PI

LiDAR TF MINI

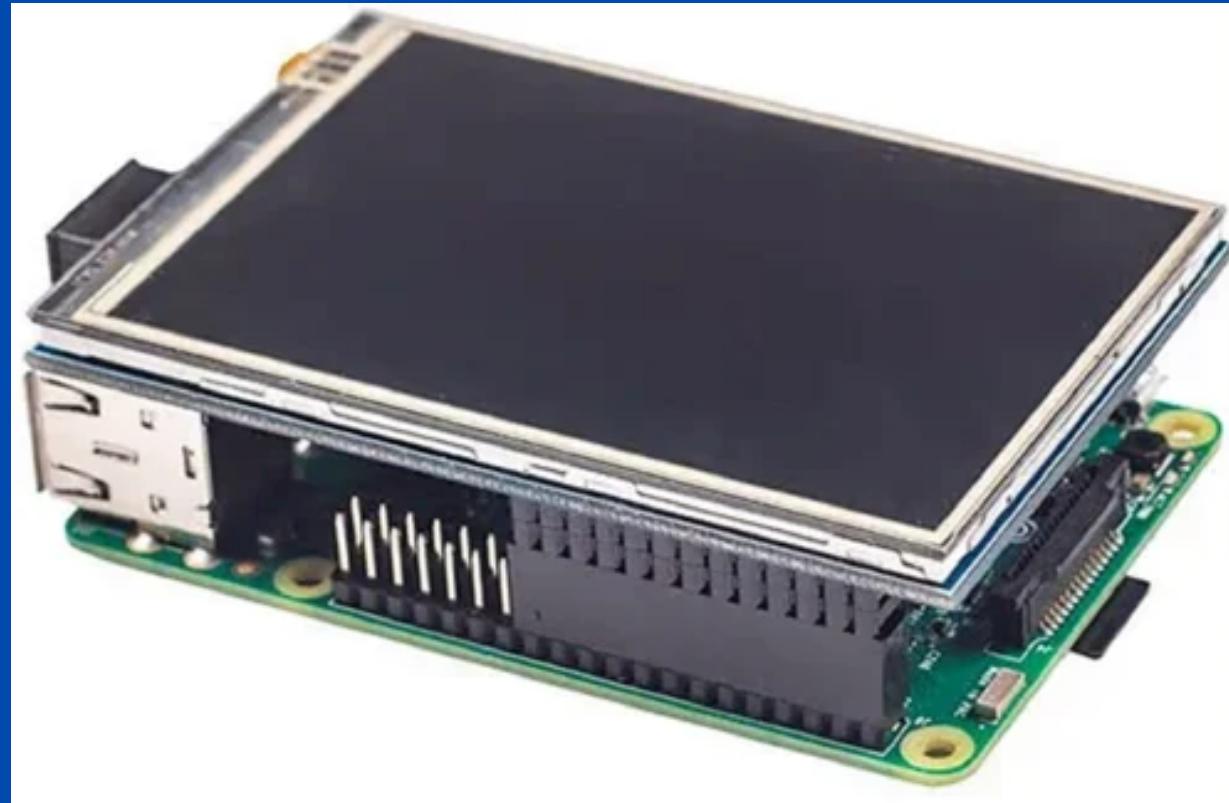
SIM 800L GSM GPRS MODULE



# METHODOLOGY

1. We have adopted a **distributed system via local host** to overcome the challenges posed by the wireless communication
2. We have pre-processed the data using **Slicing/indexing** and employing the **Apriori algorithm** to reduce the computational size and latency.
3. **Gyro** has been used to continue tracking the miner in case the **GPS stop tracking** the location of the user when he enters regions lacking proper connectivity.
4. **LiDAR** has been employed for estimation of depth and obstacle detection.

# SAFETY



- **Temperature and Pressure sensor** values can be used to send alert messages to the miner.
- Alert messages in case of loss of GPS signal can be sent via the **SIM800L GSM GPRS Module**.

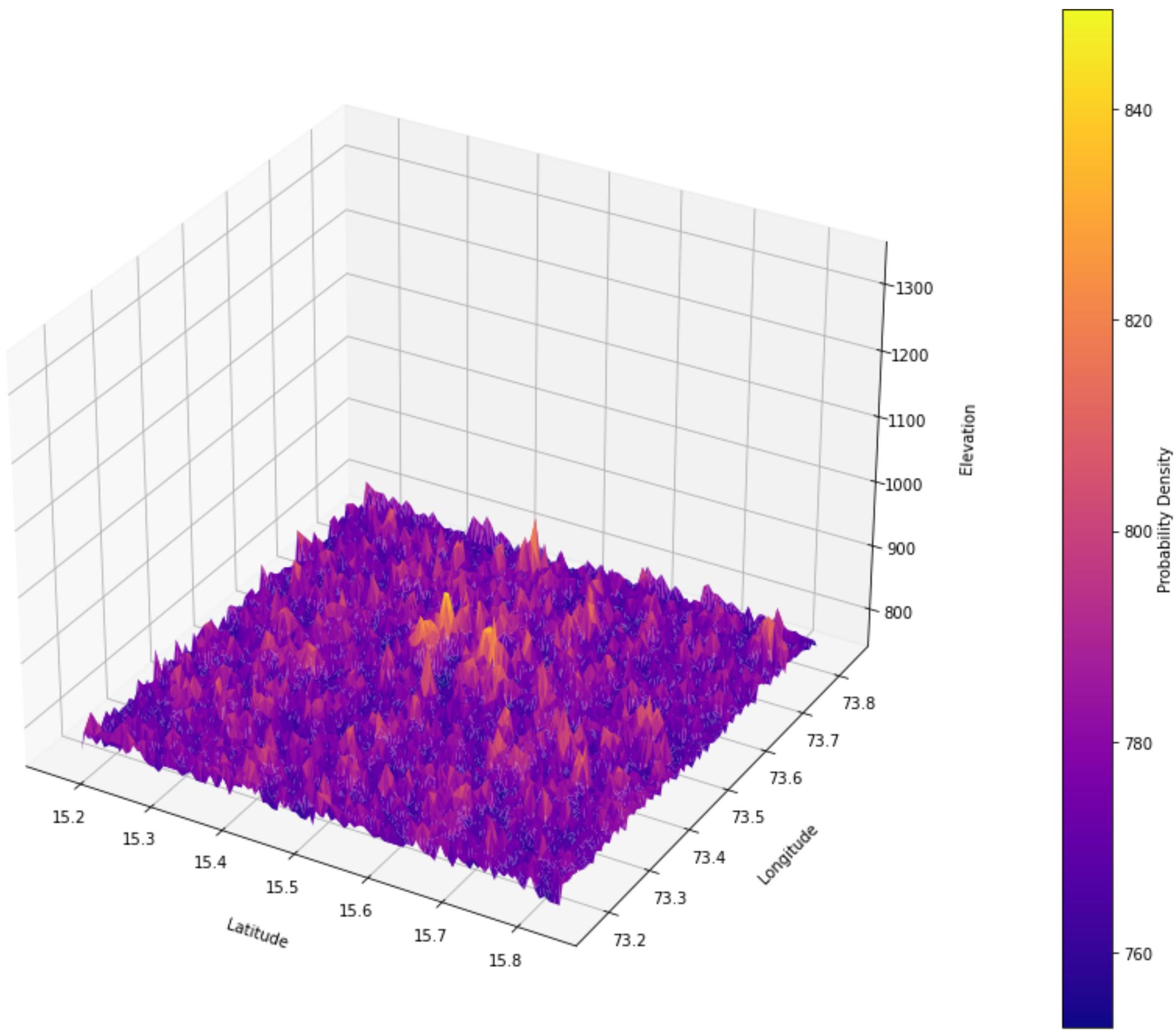
## INDUSTRIAL STANDARDS FOR EQUIPMENTS USED DURING MINING:

- **IP 65, IP66** (Casing for PROTECTION AGAINST DUST, WATER).
- **Resistive display** to prevent damage due to debris, pressure and temperature conditions.

# FUTURE SCOPE

1. A **local host** would be established somewhere outside the mine which has access to **Wi-Fi connectivity** so that the miner can update the Global database, for future reference, at the end of the mining process everyday.
2. We will make use of the **variations in concentration** observed in the ore body model to generate a **probabilistic ML model** which will tell us about the probability of a high ore concentration in a specific point on the map.
3. Scaled up **Infrared Sensors** for estimating concentration of ore at the site.
4. **Mesh Networks** for fast communication using routers without Internet Connectivity ( For underground mines)

# FUTURISTIC PROBABILITY MODEL FOR ORE CONCENTRATION





**THANK YOU FOR  
YOUR  
ATTENTION**