Basic Details of the Team and Problem Statement

Ministry/Organization Name/Student Innovation: Ministry of Mines

PS Code: SIH1511

Problem Statement Title: Real time Knowledge of ore body being mined out

Team Name: ByteBenders

Team Leader Name: Shubham Nayak

Institute Code (AISHE): C-33641

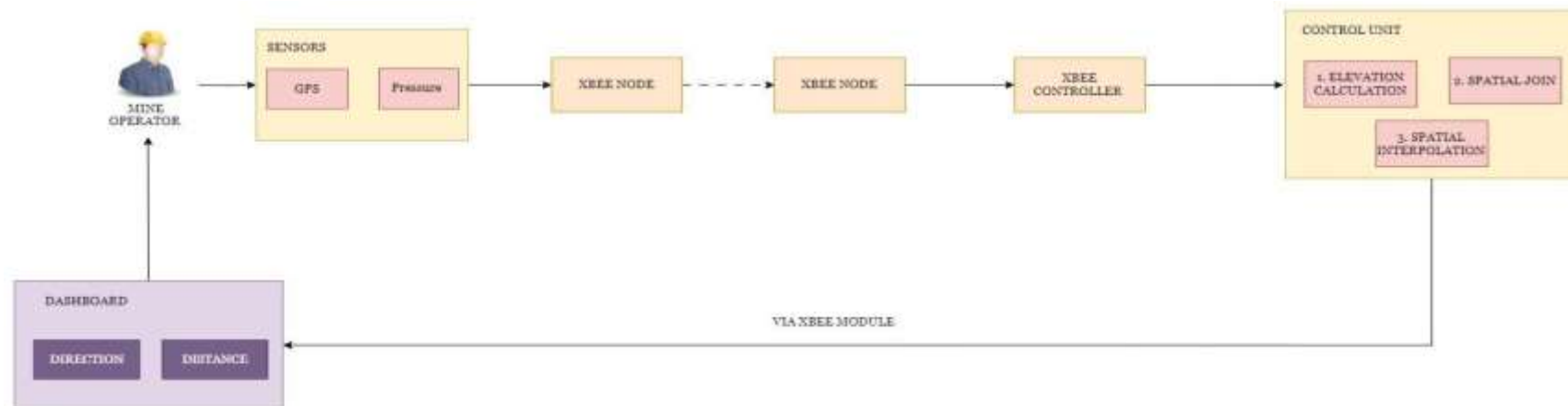Institute Name: Veermata Jijabai Technological Institute

Theme Name: Mining of Ores

Idea/Approach Details

➢ Implement a real-time guidance system using high-precision GPS sensors and elevation data for mining equipment.

➢ Compare the operator's location with ore block model data and provide real-time suggestions for quality control during excavation.

➢ Install BMP180 Barometric Pressure sensor (to calculate elevation level) and NEO-6M GPS Module on mining equipment to collect data.

➢ Use XBee modules for wireless data transmission to a control unit, with repeaters for extended range.

➢ Utilize spatial join and interpolation methods to determine distance and direction to optimal ore quality.

➢ Real-time guidance regarding distance and direction suggestions on a dashboard for the operator.

TECHNOLOGY STACK:

- NEO-6M GPS Module

- BMP180 Barometric Pressure sensor

- Arduino microcontroller

- XBee modules

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Idea/Approach Details

Use Cases:

➢ Mining Operations

➢ Establishing topographic maps

➢ Optimized Navigation

➢ Urban Planning

➢ Agricultural Productivity

➢ Disaster Management

➢ Estimate vegetation structural metrics

➢ Exploration and Expansion

Show stoppers:

➢ User-friendly interface to predict the most efficient movement of operator for maximum resource utilization

➢ Can be scaled to accommodate the exploration and expansion of new mining areas, ensuring that operators receive guidance in unfamiliar terrains

➢ Supports more sustainable mining practices by minimizing unnecessary excavation

➢ Enhances safety by guiding operators away from potentially hazardous or unstable areas

➢ Allowing for immediate adjustments in mining operations with Real- time data driven guidance

Team Member Details

Team Leader Name: Shubham Nayak

Branch (Btech-EXTC)   Stream (ECE)   Year (IV)

Team Member 1 Name: Kartika Sharma

Branch (Btech-Electrical)   Stream (EEE)   Year (IV)

Team Member 2 Name: Parth Pawar

Branch (Btech-EXTC)   Stream (ECE)   Year (IV)

Team Member 3 Name: Ojas Taskar

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Team Member 4 Name: Kimaya Mutha

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Team Member 5 Name: Saniya Deshmukh

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