



eltic-Plus⁺

Smart Connected World



WINS@HI

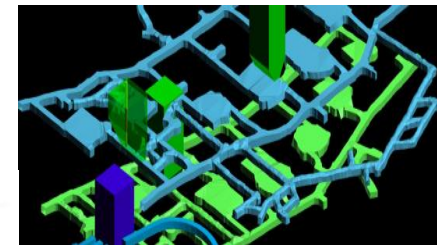
Wearable IoT Network Solution for Work Safety in
Hazardous Industrial Environments

Project Coordinator - NETAS



- **Main Goal:**

- Assessment of Risks and Preventing Accidents
- Improving Work Safety of Underground Workers
- In Case of Occupational Injuries and Hazards:
 - Tracking Location of Workers
 - Remote Health Monitoring
 - Guiding Emergency and Rescue Units



- **Description:**

- Wearable Sensor Networks
- Wireless Underground/Indoor Communication
- Data Analytics
- Network Anomaly Detection and Monitoring Algorithms
- Disaster/Emergency Management



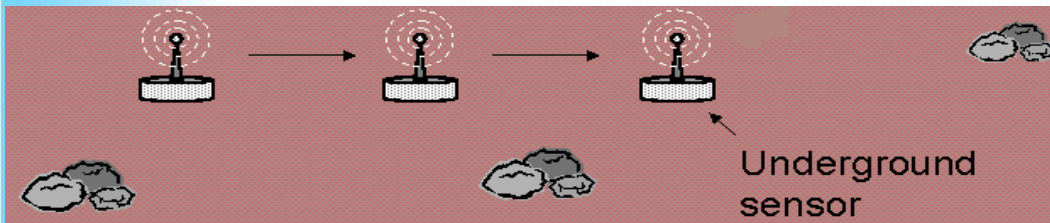
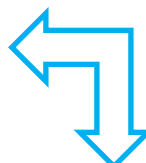
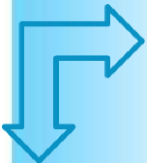
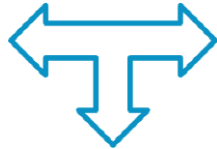
- **Status**

- Project is **labeled** and about to start-up





System Architecture



- Guide Search/Rescue Units
- Mobile and Web Applications
- Network Management/Monitoring
- Anomaly Detection Algorithms
- Alarm Management
- Location Tracking
- Health Monitoring
- Feature Extraction
- Adaptive/Machine Learning
- Dynamic 3-D Modeling of Mine
- Wearable Sensors
- Energy Efficient Design
- Underground Wireless Comm.
- Scalable and Robust

- **Pre-Accident Use Cases:**

- Health Monitoring
- Remote Sensing of Threats
 - E.g., Methane, Dust Explosions, Flooding
- Early Warning Alarms to Prevent Mine Disasters
- Robust Underground Communication
- Dynamic 3-D Mapping of Mines
- Location Tracking

- **Post-Accident Use Cases:**

- Uninterrupted Service After Explosions or Mine Falls
 - Communication with Miners
 - Precise Location Detection
- Guiding Search and Rescue Teams in Case of Emergency

Possible Use Cases for Tunnels and Subways

- **Pre-Accident Use Cases (condition monitoring):**
 - Prediction of Accidents
 - Remote sensing of heat, humidity or gases
 - Dynamic 3-D Mapping of Tunnels
 - Robust Underground Communication
 - Location Tracking
- **Post-Accident Use Cases:**
 - Uninterrupted Service After Accidents
 - Precise Location Detection of Accidents
 - Management of Emergency Situation
 - Directing Search and Rescue Teams in case of Emergency
 - Communication with First Aid Forces

WP1: Management

- Project Coordination and Administration
- Technical Management

WP2: Requirement of the Project

- Business Model
- Systems Requirements and Specifications
- Design and Architecture
- Definition validation use cases
- Standardization issues

WP3: Wearable Sensor Networks

- Wearable Sensor Hardware Design
- Sensor mesh network
- Sensing of Mine Environment
- Location Tracking
- Sensing of Health Status of Miners

WP4: Wireless Underground Communication

- Utilizing frequency bands
- Antenna Design
- Communication Protocols
- Interoperability with rescue unit systems

WP5: Data Analytics and Monitoring System

- IoT Gateway Design
- Platform Development
- Data Analytics, Network Anomaly Detection
- 3-D Mapping of Mine / Tunnel / Metro Station
- Software Applications

WP 6: Testing and Integration

- Testbed
- System Integration and Testing
- System Performance Testing

WP 7: Disseminations and Exploitations

- Disseminations
 - Standardizations
 - Training and Public Awareness
 - Publications
- Exploitations
 - Business Model
 - New Markets ...

Are you interested in joining?



Please let us know about the WPs that you would like to be involved!

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