iOmniscient

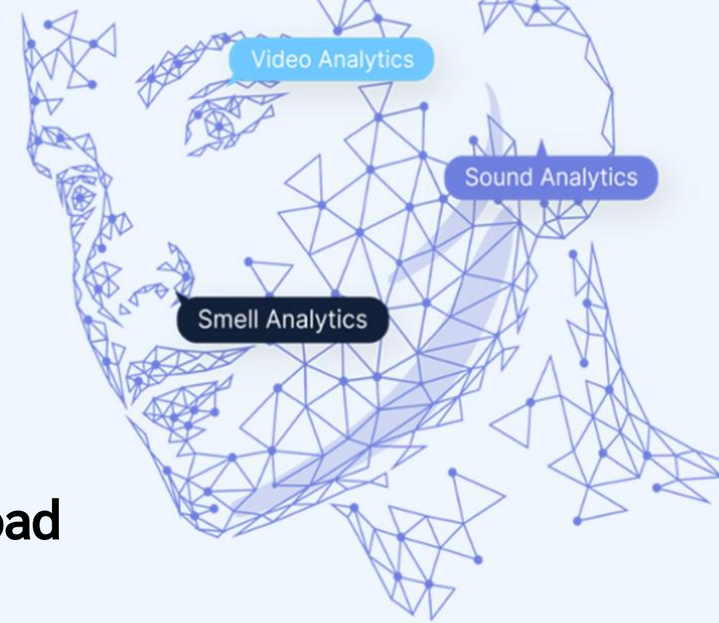
SMART MINING

Multi-sensory AI that keeps mines safe, improves efficiency, and extends the same outcomes to the rail, port and road infrastructure around them.



iOmniscient

Table Of Contents



1 Why Smart Mining

2 System & Multi-Sensory AI

3 Safety

4 Operational Efficiency

5 Environment & Security

6 Port, Rail & Road

7 Cost Effective

8 Autonomous Response

9 About iOmniscient

Click a number and go to the page

iOmniscient

Why Smart Mining

Mining is a major industry for many countries — but large, remote sites make risks difficult to monitor manually.

The Challenge

Chemical, physical, security and environmental hazards all need constant monitoring across sites that are large, remote and hard to staff.

The Smart Mining Answer

Use existing cameras and sensors to detect events early, understand where they happen, and guide the right response.

The Solution

1. Detect hazards
2. Alert the correct person
3. Show location and action
4. Reduce risk, downtime and cost



KEY IDEA

The goal is not only “seeing” the mine — it is turning events into faster decisions.

iOmniscient

System & Multi-Sensory AI

A simple way to understand the system: different signals come in, AI analyzes them, then the system pushes an action.

1. Mine Site Signals

CCTV cameras
Microphones
Smell / gas sensors

→

2. AI Analysis

Video analytics
Sound analytics
Smell analytics

→

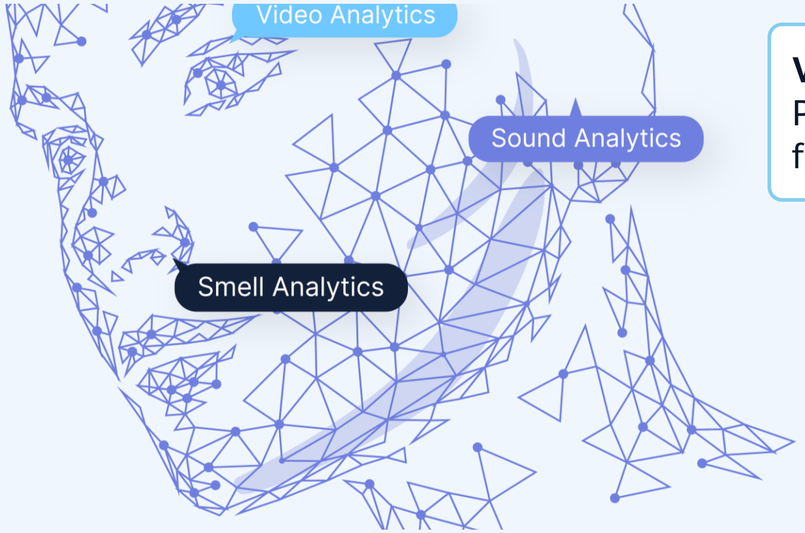
3. Event Detection

PPE violation
Gas / fire / dust
Fall / intrusion

→

4. Smart Response

Find responder
Send location
Give action steps



Video
People, vehicles, PPE, falls, fire/smoke

Sound
Unusual machine noise, alarms, compressors

Smell
Gas leaks, chemical hazards, early warning

Multi-Sensory Monitoring
It works like an extra safety team that can watch, listen and smell at the same time — then report the right problem to the right person.

iOmniscient

Safety

Prevention

- PPE detection: helmets, fluorescent jackets
- Driver match
- Small vehicle stopped
- In autonomous-truck path

Hazard Detection

- Gas leak detection
- Smoke and fire detection
- Smell detection for chemical hazards
- Noise control from grinders and compressors

Physical Safety

- Slips and falls
- Falls from a height
- Geo-hazards and rock falls
- Evacuation management



Early Warning
The safety value is early warning: detect dangerous behavior or hazardous conditions before they become a serious incident.

iOmniscient

Operational Efficiency

Smart Mining is not only about safety. It also helps reduce downtime and understand how the site is actually operating.



What it monitors

- Time spent in locations
- Car park management
- Conveyor belt stalling

What it improves

- Preventive maintenance
- Faster decisions
- Less manual checking

iOmniscient

Environment & Security

Environmental protection and security can use the same platform, so sites do not need separate systems for every problem.



Environmental Monitoring

- Dust plume detection
- Gas leak detection
- Noise control
- Sustainable monitoring

Security Monitoring

- Databaseless access management
- Intrusion detection
- Intruder ID support

Why this matters

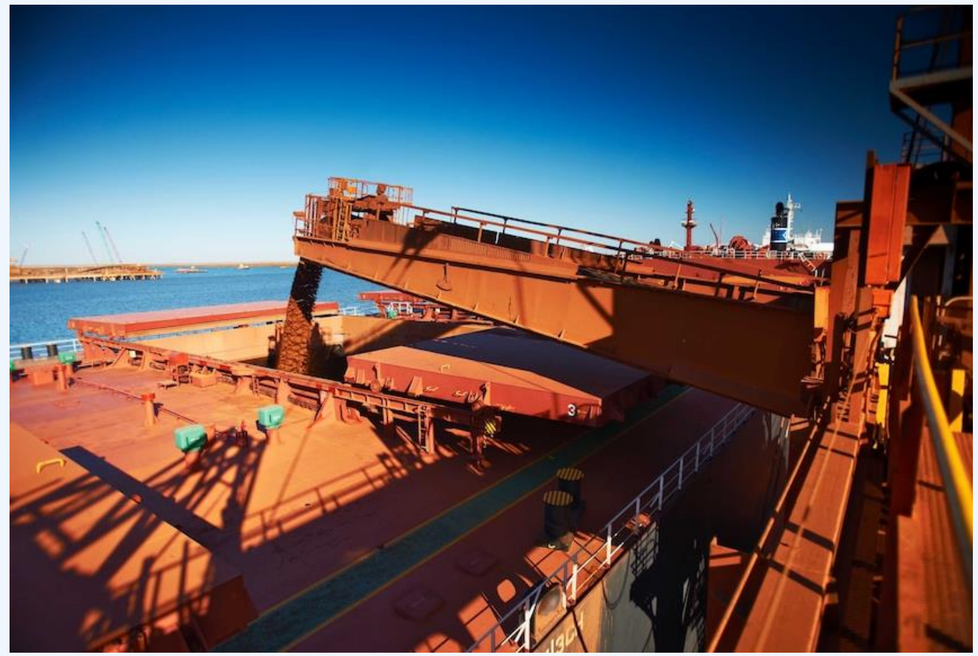
Dust, gas and noise affect worker health and environmental compliance. Intrusion and access issues affect site safety and asset protection.

Environment & Security
Environment = protect people and nature. Security = control who enters and what happens on site.

iOmniscient

Port, Rail & Road

Mining requires transportation — safety and efficiency extend beyond the pit.



Port
- Safe loading
- Dust cloud detection
- Worker safety

Rail
- Rail-head safety
- Loading areas
- Human safety

Road
- Fallen debris
- Wrong-direction vehicles
- Accidents, speeding, jaywalking

Mine → Rail → Port → Road users

Connected Infrastructure
A mining project needs connected infrastructure.
Smart Mining can support safety and incident management not only inside the mine, but also around it.

iOmniscient

Cost Effective

The business value is that the system is designed to work on lighter infrastructure, not a heavy and expensive setup.

Conventional System	iOmniscient Smart Mining
Requires new camera infrastructure	Uses existing CCTV infrastructure
Requires high-resolution cameras	Works with low-resolution cameras
Requires more cameras	Requires fewer cameras
Requires GPU hardware	No third-party GPUs required
Requires a large control room	A smartphone becomes the control room
High storage and bandwidth requirements	90% less storage and bandwidth

90%
less storage & bandwidth

0
third-party GPUs

Fewer
cameras & personnel

Phone
as the control room

iOmniscient

Autonomous Response

When an event occurs, the system can find the appropriate responder and tell them where to go and what to do.

1. Detect

Multi-sensory AI — video, sound and smell — identifies the event.

2. Identify

The system finds the appropriate responder for the event.

3. Route

Location and required action are pushed to their smartphone.

4. Resolve

Status updates once the responder clears the event.

Privacy Protection
Operators cannot recognize individual people, but the system can still raise alerts for safety, security and operational issues.

Why this is important
This allows mines to improve awareness and response while reducing unnecessary exposure of personal identity.

©2025 iOmniscient Corporation

About iOmniscient

with intel

All iOmniscient Products run exclusively on Intel based computing hardware using OpenVINO™

- The use of Advanced AI technology that goes beyond Deep Learning enables iOmniscient to run its systems without the need for 3rd party GPUs.
- This reduces the power required by a factor of 16 – resulting in a 16-fold reduction in the carbon footprint.
- This is just one part of a multi-faceted program to help customers to implement Sustainable Systems.

www.iomni.ai

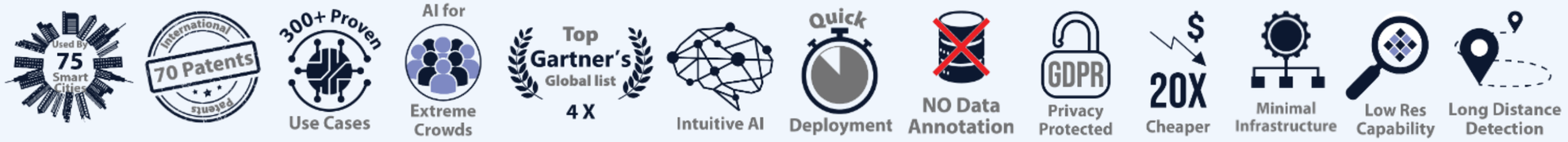
enquiries@iomni.ai

©2025 iOmniscient Corporation

About iOmniscient

- iOmniscient is an **Ethical AI** company.
- It offers **multi-sensory (video-sound-smell) Artificial Intelligence based analytics for Autonomous Systems.**
- It focuses on ensuring **Outcomes** for its customers.
- With **over 2 decades of experience,** iOmniscient systems have been demonstrated to be **robust,** operating with high accuracy and few false alarms especially in **complex and crowded** environments.
- By design, its systems **reduce the cost of infrastructure** required:
  - they can use existing cameras
  - they require fewer cameras with lower resolution
  - they require 90% less storage and network bandwidth
  - they are computing light and require no GPUs
  - they allow autonomous operations requiring fewer personnel to operate
- iOmniscient has implemented projects in **70 countries.**
- With over **70 international patents** many of its capabilities are unique and unavailable from any other source.





iOmniscient