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Lenovo

# iQ-Preventive Maintenance

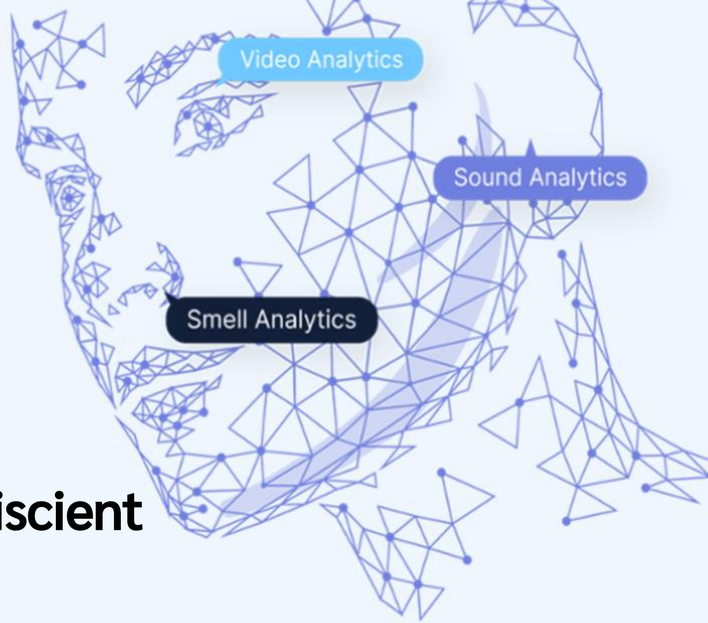
## Small-data predictive models and multi-sensory anomaly detection

Equipment analytics



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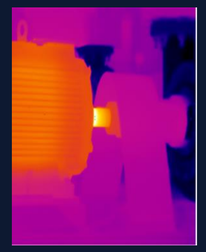

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# The Maintenance Challenge

High Mean Time Between Failures (MTBF) makes deterioration data hard to collect

**PREDICTIVE MAINTENANCE**



**HIGH MTBF**

## Years between failures

Modern machinery can run for years before parts wear out or fail.

### Sparse examples

Sufficient datasets of deteriorating equipment are virtually impossible to collect.

### Small-data models

iOmniscient needs very small datasets to estimate when maintenance is required.

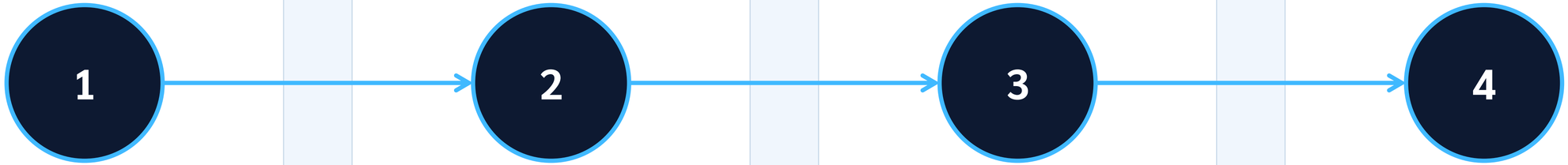
### Anomaly signals

Changes in look, sound and smell can indicate potential performance deterioration.

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# How the System Works

Multi-sensory analytics can respond much as a human would




## Learn

Build predictive models from very small datasets of deteriorating equipment.

## Monitor

Analyze the look, sound and smell of equipment during operation.

## Detect

Find anomalies that may signal deterioration or an equipment problem.

## Respond

Find the responsible person and tell them where to go and what to do.

VERY SMALL TRAINING SETS

ACTION BEFORE FAILURE

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# Applications

MULTI-SENSORY ANALYTICS

## Detect anomalies before failure

Detect overheating, unusual conveyor sounds and metal objects such as coins or bolts on escalator steps.

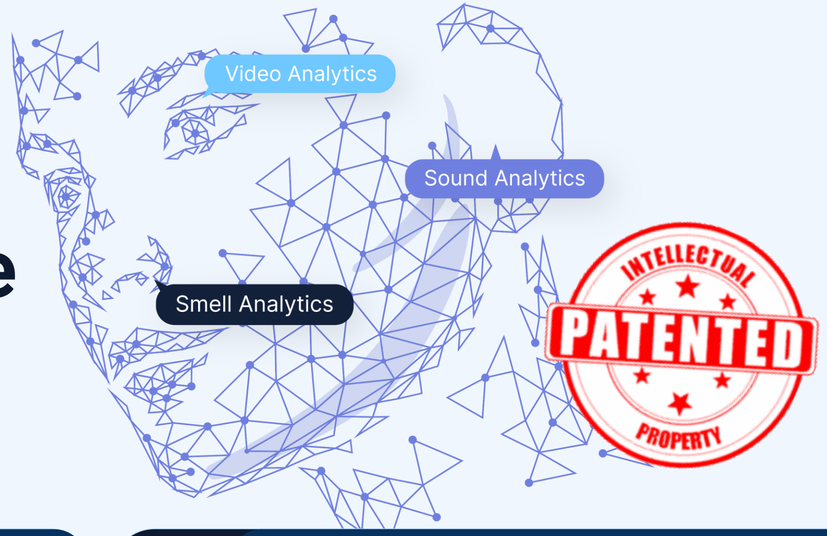
Abnormal food-product smells can also reveal a problem before catastrophic failure.

Rapid deployment across diverse equipment.

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# Efficient & Responsible Infrastructure

Advanced Multi-Sensory Analytics – Video, Sound, Smell




## 01 COST EFFECTIVE

**Uses existing**
CCTV infrastructure

**No GPUs**
16×↓ carbon footprint

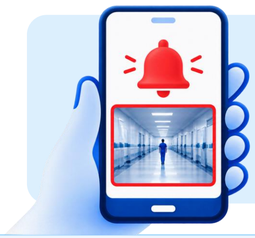
**Fewer cameras**
Lower-resolution cameras

**90% less**
Storage and network bandwidth

## 02 AUTONOMOUS RESPONSE

**Detect** › **Find** › **Respond**

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



They do not require a large control room environment – **a smart phone becomes the control room.**

## 03 PRIVACY PROTECTION

**All systems are privacy protected.**
Privacy is never compromised even though the system is aware and can raise alerts for all issues related to safety and care.

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# About iOmniscient

## Partnership

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.

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# 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 specially 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.







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