

# Transportation enters the sensory era.



**Transform your transportation assets into intelligent sensory systems.**

Ellona transforms vehicles and mobility infrastructures into systems capable of detecting, analyzing, and understanding their environment in order to enhance safety, maintenance, and passenger experience.

**More than connected.  
Aware. Adaptive. Intelligent.**





# The next generation of transportation systems

Thanks to Human Sensory Digitization™, vehicles and infrastructures can:

- **Monitor** indoor air quality
- **Detect** gases, odors, particles, and pollutants
- **Identify** mechanical and acoustic signatures
- **Analyze** environmental and behavioral signals
- **Anticipate** technical failures

- > **Safer mobility.**
- > **Predictive maintenance.**
- > **An optimized passenger experience.**



Human perception as the reference



Human Sensory Digitization (HSD)

## Biomimicry applied to transportation

Ellona digitizes human senses and embeds them into mobility systems.

### Our technology combines:

- Miniaturized multi-sensor modules
- Advanced multisensory data fusion
- Self-adaptive artificial intelligence
- Environmental signature databases linked to human perception

**We don't just measure parameters.  
We decode complex sensory signatures.**

# High-value applications

1

## Safety and risk prevention

- Detection of toxic gases, odors, and pollutants
- Prevention of driver drowsiness
- Detection of fuel leaks and smoldering fires
- Detection of illicit substances in vehicles and containers
- Monitoring of anomalies and unusual noises



2

## Predictive maintenance

- Detection of engine faults and anomalies
- Monitoring of tanks and leak detection
- Analysis of mechanical and acoustic signatures
- Optimization of fleet management and operations
- Monitoring of transport conditions (temperature, humidity, etc.)



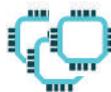
3

## Passenger and user experience

- Monitoring of indoor air quality
- Detection and management of odors
- Control of cleaning processes
- Improved comfort in cabins, carriages, and vehicles
- Well-being of passengers and transported animals



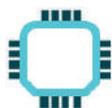
# Multisensory data fusion technology



## Intelligent sensor selection

Ellona selects and configures the most appropriate sensors for each operating environment. The architecture optimizes both electronic performance (signal-to-noise ratio) and fluidic design to enhance measurement quality and stability.

Exemples : MOS (odeurs), PID (COV), électrochimiques (gaz spécifiques).



## Advanced multisensory data fusion

Various miniaturized sensor technologies are combined to capture and correlate complex environmental signatures.

Examples: MOS, PID, electrochemical, optical, acoustic, NIR and IR sensors — orchestrated within a coherent and optimized architecture.



## Virtual sensors and data enrichment

Data modulation and fusion algorithms enable the generation of virtual sensors from a limited number of physical sensors.

Example: multi-sensor signatures enabling the identification and differentiation of multiple odor or gas sources.



## Adaptive intelligence and environmental signatures

Data is analyzed in real time to identify sensory signatures and build continuously evolving databases.

Examples: dynamic calibration, drift compensation, and inflection point detection in sensory signals.

# Transforming human perception into technological intelligence

## 1 Signal recognition



### Olfaction

- Gas
- Odours
- Pollutants

### Vision

- Visual analysis
- Anomaly detection
- Monitoring

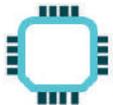
### Touch

- Temperature
- Vibration
- Pressure

### Audition

- Acoustic signatures
- Mechanical noise
- Acoustic anomalies

## 2 Human Sensory Digitization (HSD)



### Miniaturized sensors

Environmental sensing



### IoT infrastructure

Data transmission and connectivity



### Artificial Intelligence

Sensory signature analysis



### Databases

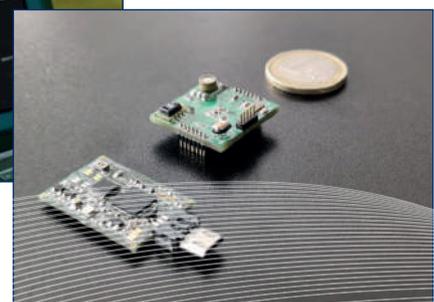
Learning and recognition of sensory signatures

## 3 Industrial integration into your devices

Ellona's sensory perception technologies are directly integrated into vehicles and transport infrastructures to enable them to:

- **Detect** their environment
- **Analyze** complex signatures
- **Understand** situations
- **Trigger** appropriate actions

**Appliances capable of sensing, understanding and acting.**



# OEM

## From prototype to industrialization



01

### **Definition of business needs:**

We work closely with you to define the requirements and objectives of your OEM project, taking into account your specific challenges and market opportunities.



02

### **Tailored solution proposal:**

By integrating our advanced technologies, we design a customized solution that meets your specific environmental monitoring and risk management needs.



03

### **Proof-of-concept validation:**

We rigorously assess the technical and operational feasibility of the proposed solution by simulating real-world conditions to ensure its effectiveness and reliability.



04

### **Demonstration of added value:**

We analyze the results to highlight the tangible benefits of our solution, including improved performance, reduced costs, and compliance with regulatory standards.



05

### **Seamless industrial integration:**

We ensure smooth integration of the validated solution into your existing production environment, minimizing disruptions while maximizing operational efficiency.

## An end-to-end solution

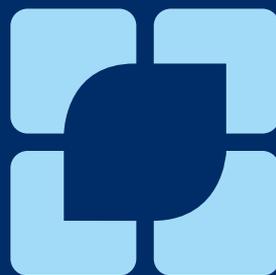
Ellona provides:

- Custom miniaturized hardware modules
- Embedded firmware
- Edge databases
- Cloud software suite
- IoT integration & mobile applications

**A complete, scalable and industrial-grade architecture.**

## A dedicated and experienced team

- Chemists, sensor experts, electronics engineers and data processing specialists: a multidisciplinary team dedicated to your projects.
- Extensive experience in OEM partnerships, from design to industrial deployment.



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