

# SENSOR REPLY: EMBEDDED AI FOR VISION

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# SENSOR REPLY

## EMBEDDED AI

Specialized in **Industrial Intelligent Solution** driven by **Edge and Embedded AI** to support autonomous and real-time decision making.

Supercar & MotorSport

Manufacturing Process

Energy Services

## SERVICES

### Smart Manufacturing Assistant



Real-time edge assistant for machine and process, based on actual production data



### Smart Mobility Assistant

Adaptive driver/fleet assistant, aimed at enhancing vehicle mission targets (energy, performance, etc.)



### Intelligent Sensing & Perception

Real-time data processing for virtual sensing, inspection, recognition and contextualization



# ASSEMBLY OPERATOR ASSISTANCE

## REAL-TIME AI SUPPORT FOR MANUAL ASSEMBLY TASKS

### CHALLENGES

- **Assist operators** during complex, multi-step assembly processes
- **Improve task accuracy, reduce errors** and training time.

### SOLUTION

- **Embedded AI pipeline** combining multiple AI models.
- **Real-time visual guidance** and **step-by-step feedback**
- **Error detection** (wrong component, missing part, incorrect order)

### APPLICATIONS

- **Manual Assembly Lines:** Assistance for manual operations
- **Training:** Real-time guidance for new or rotating staff
- **Quality Assurance:** Automated validation of each assembly step to prevent non-conformities at the source

Operator Assembly Station

UTENTE 1 UTENTE 2 UTENTE 3 STOP DATA RESET

GARDEN PUMP

Assembly Progress

1 Main Body Step 1 2 Filter Cap Step 2 3 Top Cover Step 3 4 Quick Connector Step 4 5 Adapter Step 5 6 Connector Step 6

Component Detection

Assembly Phase Classification

KPI

Assembly time: 00:00 Errors: 0 Selected object: Garden pump

AI Assembly Guidance

Ready to Begin Assembly

Next Action: Pick up the Main Body and position it at the center of the workspace



HOST: ASTRIAL (Hailo H-8)

HAILO



# GEN AI ON EDGE

## GENERATIVE IMAGE-TO-TEXT FOR CONTEXT AWARENESS

### CHALLENGES

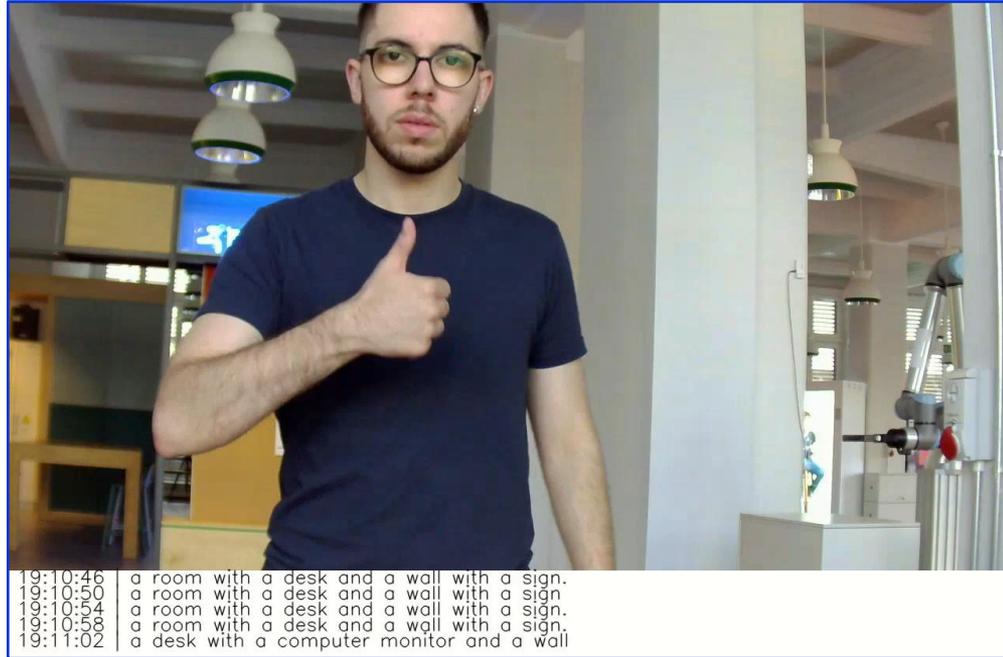
- Bring **generative AI capabilities to the edge**
- **Deploy computationally intensive models on embedded platforms**
- Ensure **low power consumption and low hardware cost**

### SOLUTION

- **Lightweight model architecture:** ViT-Base (CLIP) + Transformer-based LM (~150M+ parameters)
- **Real-time image description on NPU < 5W**

### APPLICATIONS

- **Video surveillance:** Real-time scene understanding and contextual summarization
- **Assistive Technology:** Assistance to visually impaired persons
- **Industrial Safety:** Continuous monitoring and narrative reporting of operator activity



HOST: ASTRIAL  
(Hailo H-8)

HAILO



# SMART CAMERA FOR INDUSTRIAL SAFETY

## HUMAN PRESENCE DETECTION IN HAZARDOUS PRODUCTION AREAS

### CHALLENGES

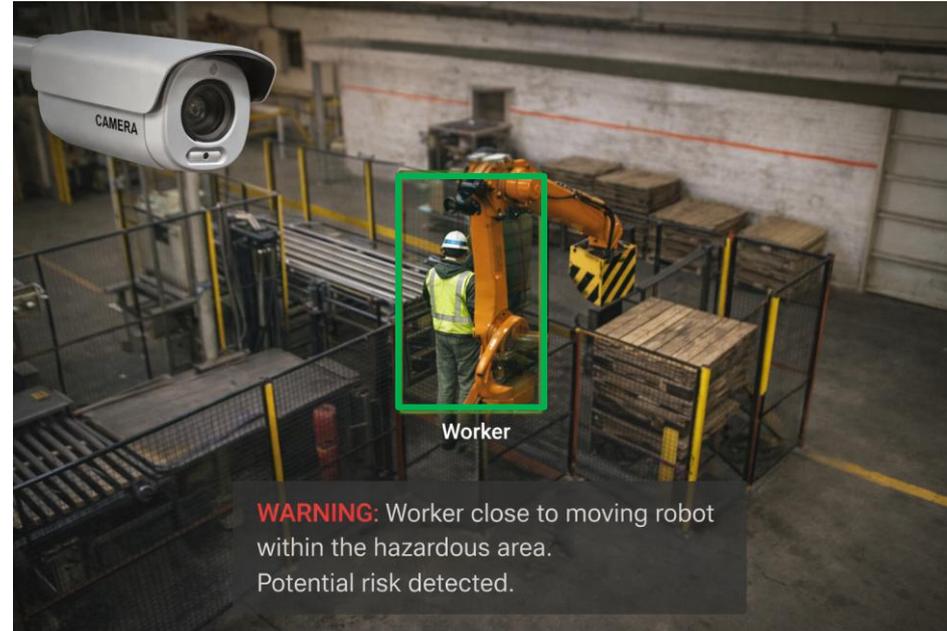
- Prevent workplace accidents by **detecting human presence inside restricted or dangerous machine zones**
- **Smart Cameras** usage to avoid network latency or connectivity loss
- **Ensure data privacy** and compliance (on-device processing, face anonymization)

### SOLUTION

- **Edge AI vision models** fine-tuned for worker detection and zone recognition.
- **Privacy-by-design** thanks to automatic face anonymization.
- Usage of low-cost network of smart cameras

### APPLICATIONS

- **Operator Safety:** Automatic detection of unauthorized presence near active machinery
- **PPE Monitoring:** Real-time detection of workers missing PPE (helmet, safety vest, gloves)



**HOST:** QB-Camera  
(Hailo H-8)

**HAILO**

**EBV**Elektronik  
I An Avnet Company I

**REPLY**  
SENSOR

**THANK YOU**