



VisionAI Inspect

Inline Image-Based Defect Detection
Systems for Automotive Production Lines



smart

advanced manufacturing

ORGANISATION PROFILE

Company Name: robolaunch

Location: METU Technopolis (Ankara/Turkey) - a leading R&D and technology hub

Team: +10 engineers across computer engineering, electrical & electronics, mechanical engineering, and industrial engineering, with hands-on experience in industrial AI systems

Core Expertise:

- **Cloud/Edge Computing** or industrial AI workloads
- **Computer Vision & Artificial Intelligence** for real-time inspection and analytics
- **Digital Twin & Simulation** for data generation, system validation, and optimization
- **Robotics & Cobots** for automated and robotic inspection scenarios

Key Products:

- robolaunch **Vision AI Engine**: An integrated **hardware + software inspection system** for real-time detection of cosmetic surface anomalies and product variations in automotive manufacturing environments
- robolaunch **AI Infrastructure**: An end-to-end AI platform enabling development, simulation, and deployment of intelligent applications, with GPU orchestration and flexible on-prem/cloud operation.

R&D Project Expertise:

- **3 nationally funded R&D projects** in artificial intelligence, robotics, and industrial cloud technologies
- **Coordinator role** in one collaborative project involving 4 partners, including 1 international partner
- Proven experience in consortium coordination, cross-organizational collaboration, and applied R&D execution

Ecosystem Engagement:

- Based in **METU Technopolis**, with close collaboration with universities, research groups, and technology organizations
- **Venture-backed startup** with a strong focus on industrial commercialization
- **Active collaboration with Turkish automotive OEMs**, including field deployments of Vision AI inspection systems in real production environments

PROPOSAL INTRODUCTION (I)

Vision: main project goal

The vision of this project is to **advance real-time Vision AI-based inspection systems for automotive manufacturing**, enabling reliable detection of product variations and cosmetic surface defects directly on production lines. The project aims to adapt, validate, and demonstrate these systems in real OEM environments, supporting earlier defect detection, higher quality consistency, and scalable deployment across manufacturing sites.

Motivation: why the project is necessary

In automotive manufacturing, many critical surface defects and product variations emerge **early in the production process**, particularly in press and body shop stages. However, existing inspection approaches often struggle with real-time operation under production constraints such as variable lighting, reflective surfaces, high throughput, and limited availability of defect data.

Manual inspections and conventional image-processing systems are insufficient to consistently detect subtle cosmetic anomalies and rare defect patterns. There is a clear need for **robust, AI-driven inspection systems** that can operate inline, adapt to changing conditions, and be validated directly within OEM production environments. The SMART programme provides an ideal framework to address these challenges through applied, industry-driven R&D.

PROPOSAL INTRODUCTION (II)

Expected outcome: descriptions of the results to be obtained in the project

- A **validated Vision AI-based inline inspection system** for **pre-paint automotive manufacturing**, where reliable automated solutions are currently limited
- An integrated **hardware + software inspection setup** for real-time detection of surface defects and product variations on unpainted metal surfaces
- A **digital twin and simulation-supported Vision AI pipeline** enabling realistic defect modeling and synthetic data generation
- **OEM-level validation** demonstrating reliable operation under real production conditions

Impacts: what will be the expected market impact of the project

- Enables **automated inspection before paint**, addressing a long-standing challenge in automotive manufacturing
- Supports **earlier defect detection**, reducing downstream rework, scrap, and quality costs
- Accelerates adoption of **simulation-supported Vision AI** for complex manufacturing environments
- Opens new **scalable application opportunities** across automotive production lines

Schedule:

Project duration: 24 months. (Timeline can be adjusted based on SMART call requirements and consortium alignment.)

PARTNERS

Partner search: type of partner searched and countries of origin (if necessary).

- **Primary target partners:**
 - Automotive OEMs or OEM-affiliated manufacturing organizations
- **Additional partner profiles (if relevant):**
 - Organizations contributing to Vision AI algorithms, inspection hardware, or system integration at the hardware–software level
- **Expected partner roles:**
 - Provide real production environments for system adaptation and validation
 - Contribute to co-development of Vision AI pipelines and inspection system components
 - Support integration, testing, and demonstration under real manufacturing conditions
- **Target countries:**
 - SMART participating countries, with strong automotive manufacturing presence



CONTACT INFO

Contact info: of the person coordinating the project proposal

Özgecan SARI

Product Manager @robolaunch

ozgecan@robolaunch.io

+90 (536) 999 5683



