JIDOKA

Human-In-The-Loop Designed Algorithms

A balanced approach to Vision AI in manufacturing

INTRODUCTION

At JIDOKA Technologies, we understand how complex it is to maintain high quality standards while production environments increasingly automate using AI. Completely replacing humans with technology is not the solution — nor is relying solely on human inspection.

The key lies in balance.

That's why JIDOKA developed **HILDA – Human-In-The-Loop Designed Algorithms**: an approach where AI and human expertise work together to structurally improve quality, speed, and reliability.

WHAT IS HILDA?

HILDA represents a hybrid automation model in which:

- AI performs repetitive tasks with unprecedented speed and consistency
- Human operators make decisions in complex or critical situations
- Real-time feedback continuously improves the system

This way, automation enhances human capability instead of replacing it.

CASE STUDY – ENGINE INSPECTION AT A LEADING AUTOMOTIVE MANUFACTURER

The challenge

Each engine contains:

- Approximately 10 critical visual features inside the cylinder bore
- Around 25 inspection points on the external surface

A defect in just **1 out of 10,000** engines can result in enormous downstream costs and reputational damage.

The existing manual inspection was:

- Time-consuming
- Inconsistent
- Responsible for over **1,000 labor hours per month**

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THE HILDA APPROACH IN PRACTICE

1. AI automation for repetitive tasks

- Per engine: 1,056 images in 70 seconds
- Analysis of 8 inspection areas
- Detection of defects such as:
  a. Damage
  b. Dents
  c. Contamination
  d. Chatter marks

Result: unmatched speed and consistent quality.

3. Real-time dashboards & continuous optimization

Operators receive real-time insights into:
- Quality statistics
- Rejection patterns
- Process performance

Continuous feedback loops make the system increasingly accurate.

2. AI + human expertise for complex decisions

- AI flags deviations
- Operators assess, validate, and train the system
- Human intervention decreases as confidence grows
- Better decisions in less time

4. Minimizing bias & increasing reliability

Human feedback:
- Corrects training data
- Detects bias
- Improves reproducibility and reliability

This keeps AI fair, robust, and consistent — even under varying production conditions.

RESULTS

- Over 1,000 labor hours saved per month
- Higher inspection accuracy
- Structurally higher quality standards
- A new benchmark in automotive quality inspection

THE FUTURE OF VISION AI IN MANUFACTURING

This case demonstrates that humans and AI together deliver better results than either alone. HILDA turns quality control into a strategic advantage, not just a cost.

A NEW FORM OF COLLABORATIONFF

HILDA proves that AI is not a replacement, but an enhancer of human craftsmanship.

By:
- Automating repetitive tasks
- Keeping complex decision-making human-centered
- Leveraging real-time insights

a production environment emerges that is smarter, more reliable, and scalable.

CONCLUSION

With HILDA, JIDOKA sets a new standard in industrial Vision AI: **technology that strengthens people, optimizes processes, and enables continuous improvement.**

Discover how Jidoka Kompass, powered by HILDA, can transform your quality control. Request a demo today and experience how humans and AI make the difference together.