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Introducing:

METAL VISION AI

Technical Documentation

Real-time computer vision platform that automatically counts and inspects metal bars from images or live camera feeds with 95.8% accuracy in 1.2 seconds.

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Overview

About the Solution

Metal Vision AI is a production-grade computer vision platform designed to eliminate manual metal bar counting across manufacturing, warehousing, and logistics operations.

Built on YOLOv8s and YOLOv10n with PyTorch CUDA acceleration and OpenCV, the platform automatically detects, counts, and localizes aluminum bars in manufacturing environments — processing images in 1.2 seconds with 95.8% mAP accuracy and non-max suppression for zero duplicate counts.

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Business Problem / Challenges

Manual counting of metal bars is time-consuming, labor-intensive, and prone to errors, leading to inventory mismatches and financial discrepancies:

- Manual counting of metal bars is slow, taking hours per audit and delaying production cycles
- Human counting errors create financial discrepancies and supply chain inaccuracies
- Labor-intensive counting processes require dedicated staff, inflating operational costs significantly
- Manual verification lacks traceability records, making audits and compliance checks difficult

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Solution Overview

Metal Vision AI leverages YOLOv8s computer vision and CUDA GPU acceleration to automatically detect, count, and verify metal bars from images or live camera feeds in real time.

By applying deep learning inference and non-max suppression, the system provides:

- YOLOv8s processes images in 1.2 seconds with GPU acceleration
- Non-max suppression eliminates duplicates for 100% accurate counts
- Pixel-precise coordinates with center points for each detection
- Color-coded bounding boxes with sequential numbering for verification

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Key Capabilities

YOLOv8s processes 800x600 images in 1.2s with NVIDIA GPU acceleration.

Non-max suppression eliminates duplicates for accurate inventory counts

Pixel-precise coordinates with center points for each detected bar

0.15 threshold filters low-confidence detections with adjustable sensitivity

Color-coded bounding boxes with sequential numbering for verification

Roboflow integration for custom datasets and continuous improvement

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Value Proposition

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01

Accuracy: 95%+ detection accuracy with standard input quality.

02

Loss Prevention: Minimize untraceable inventory discrepancies.

03

Efficiency: Reduce manual counting efforts by 80–90%.

04

Scalability: Deployable across multiple sites with standardized setup.

05

Transparency: Visual audit trail enhances accountability and trust.

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Primary Tools & Technologies

01

AI Models

YOLOv8s and YOLOv10n with PyTorch 2.4 and NVIDIA CUDA 12.4 for GPU-accelerated inference.

02

Backend APIs

Django 5.1 and FastAPI with OpenCV 4.10 and Pillow for image processing and REST endpoints.

03

Deployment

Docker and Kubernetes with Roboflow Universe for dataset management and model retraining.

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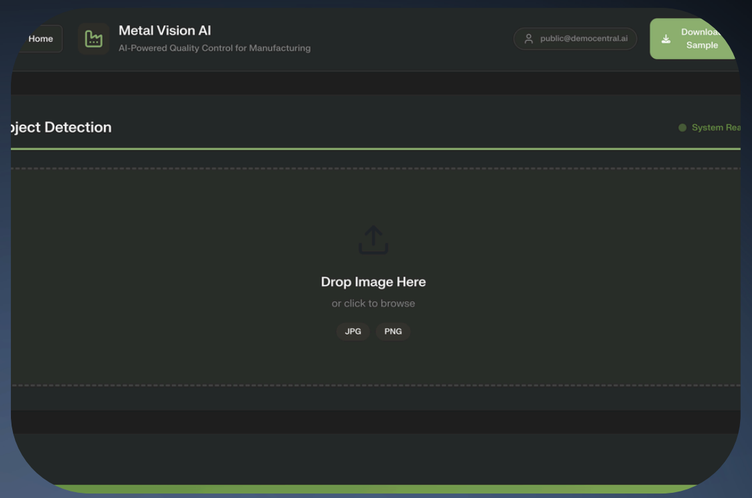
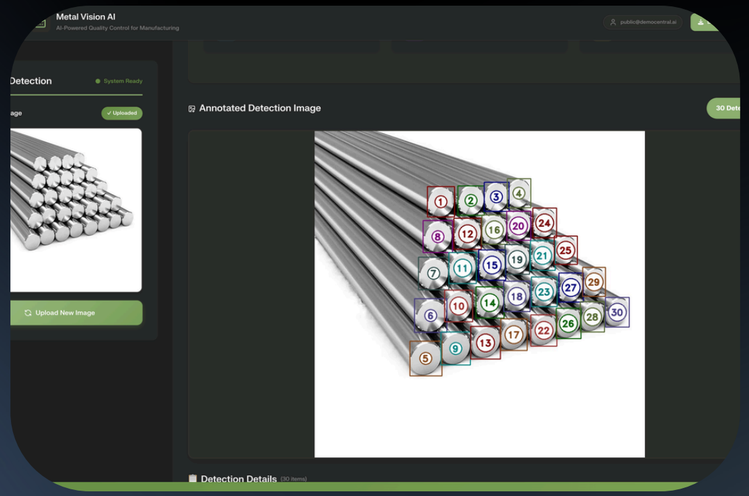
Solution Glimpses

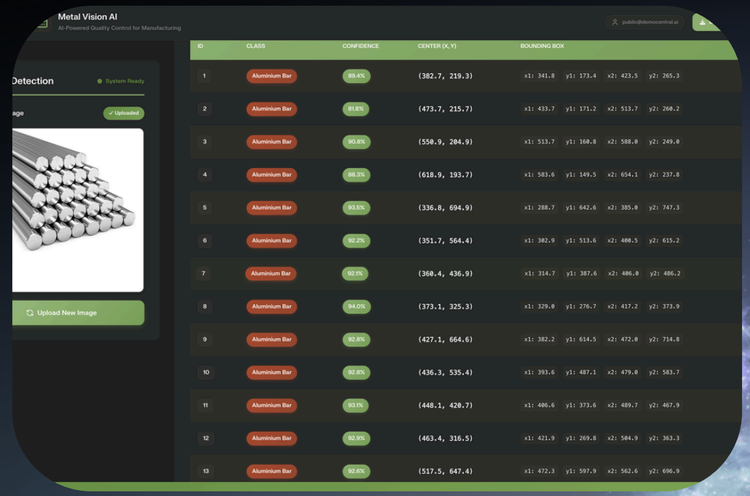
Image Upload



Annotated Detections



Results



Watch the full video on Vimeo.com or scan here to watch:

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Request a Demo

If you find this solution relevant to your use case, please feel free to try this prototype or request a custom demo.

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Custom Demo

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