

Solution Brief

Logistics and Tracking
Artificial Intelligence

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Unlocking a New World of Possibility for Manufacturing and Warehouse Hardware Providers with Irida Labs' Edge Vision AI Solution

The Irida Labs solution, powered by Intel® Processors and optimized with the Intel® Distribution of OpenVINO™ toolkit, empowers hardware providers to integrate advanced vision AI into their products and deliver greater value to their end customers.



IRIDA LABS

About Irida Labs

Irida Labs is powering Computer Vision based AIoT sensors and solutions, helping companies around the world develop scalable vision-based solutions. They provide AIoT-optimized embedded vision software using computer vision and deep learning, transforming bounding boxes into real world vision applications.

Leveraging more than 10 years of cross-field engineering expertise in embedded computer vision hardware and software, AI and machine learning, vision systems design and optics, Irida Labs provides support throughout the Vision-AI product lifecycle, from system design up to ready-to-use on-device Vision AI.

Complex Operations Cause Significant Pain Points for Warehouses and Manufacturers

The management of warehouse and factory floors require numerous difficult and complicated processes that involve heavy operational workloads in dynamic environments. Companies consistently struggle to keep track of products as they move through the production process, monitor product quality, maintain safety protocols, and optimize facility operations that enhance ROI.

Warehouse administrators often rely on staff to manually perform on-the-ground processes, such as inventory management, an extremely difficult task requiring tracking thousands of different packages, parcels, and pallets in large warehouse environments across varied product categories. And this is just one facet of warehouse and factory operations. Manually performing and analyzing such complex processes is a daunting task and, unsurprisingly, this approach results in exorbitant labor costs, inaccurate and error-filled tracking, subpar quality control, and a lack of insight on how to optimize facility efficiency while also keeping workers safe. Floor managers and administrators need solutions that can help overcome these challenges, and they are turning to their hardware providers to deliver them.

AI Offers Hardware Providers the Opportunity to Simplify and Improve their Customers' Operations

With advancements in artificial intelligence (AI) customers now have the opportunity to realize Vision AI in real-world scenarios to address and overcome common pain points. Through automation and augmentation of existing hardware, customers can improve inventory tracking, improve quality control, optimize existing processes, reduce reliance on manual monitoring, and use insights for data-driven decision making to improve outcomes.

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Despite the opportunity offered by AI, according to the [MHI Annual Industry Report 2022](#), only 12% of respondents are currently using AI technology.¹ However, more than half of the respondents believe that AI has the power to disrupt the industry and create a competitive advantage for their business.¹ In addition, the 2021 report found that due to recent supply chain disruptions, over 49% of supply chain leaders have accelerated spending in digital technologies to make their operations more responsive and forward-looking.²

All these factors combined means that the opportunity is ripe for AI-based offerings in the warehouse and manufacturing markets. To capitalize on this, hardware providers are searching for ways to integrate intelligent capabilities into their products to create smarter and more effective solutions for their end customers that enable them to improve their competitive edge, enhance the efficacy and usefulness of products, and ultimately enable better outcomes for their customers. Irida Labs can help hardware providers do just that.

Irida Labs Helps Hardware Providers Integrate Intelligent Capabilities into Existing Solutions with Edge Vision AI

Irida Labs' Edge Vision AI solution is powered by PerCV.ai, their end-to-end platform for deploying Vision AI at scale, and unlocks a new world of possibilities for a diverse array of hardware manufacturers by allowing them to integrate visual perception into their products.

The solution allows visual recognition, identification, tracking and 3D pose estimation of objects (products, parcels, pallets etc), vehicles (cars, trucks, forklifts, AGVs etc) and people with state-of-the-art accuracy, based on Computer Vision and AI/ML, enabling the development of a plethora of purpose-specific applications. Some common examples of the enabled applications include tracking of products (e.g. pallets, parcels, packaged goods), non-disruptive vision-based scanning (e.g. contextual QA, QR barcode scanning), and visual inspection of specialized processes (e.g. welding, material flow), usually in challenging environments with poor lighting or rugged conditions. Irida Labs' Solution offers hardware manufacturers the flexibility to develop customized applications to fit their end customers' most unique needs; sky is the limit when it comes to the processes that can be transformed using Vision AI.

Taking the example of warehouse production management, PerCV.ai-powered sensors allow hardware manufacturers to add new layers of automation and enable their end customers to reap unprecedented operational business excellence. The Edge Vision AI Sensor, powered by PerCV.ai and built-in collaboration with Intel, provides the backbone for fully automated inventory management, effectively eliminating planning errors and improving the accuracy of stock monitoring that results in the mitigation of shortages, delays, and other issues.

Smart Vision AI-based product recognition and tracking allows 24/7, unsupervised monitoring of product inventory with state-of-the-art accuracy, low deployment cost, small dimensions, low power consumption, and fast proof of concept (POC) and time-to-market.

Typical Manufacturing and Warehouse Applications



Inventory monitoring



Product tracking and localization



AGV coordination



Real-time stock monitoring



Replenishment planning



Fraud prevention



Warehouse monitoring



QR & Barcode Scanning



24/7 real-time analytics

Without the need for cloud processing, the data are processed at the edge and are fully protected, while the SW AI sensors adapt to each business's installation environment and unique needs, from quality assurance and QR code scanning to 24/7 product localization, tracking, and personal protective equipment (PPE) monitoring.

In contrast to typical solutions that mainly offer providers the tools for AI, specific hardware or only AI and machine learning models, Irida Labs' end-to-end approach provides not only the infrastructure but also the operational framework. They support hardware providers throughout the entire Vision AI product development lifecycle, from problem formulation to end-product deployment. This greatly minimizes resource requirements and time-to-market while maximizing efficiency and scaling.

A Whole New Spectrum of Hardware Features

1 Empower Providers with New Capabilities

Enable hardware manufacturers to easily integrate a new layer of intelligence based on computer vision and AI into an array of new or existing products that can deliver new value to end customers by addressing a variety of unique needs

2 Streamline the Product Development Process

PerCV.ai handles the heavy lifting of orchestrating all the building blocks required to deploy a Vision AI solution; Vision Sensors & Edge Devices, Digital Vision Twin, Edge Hardware, Vision AI Software, Data Engine, APIs and AI Analytics are all integrated into the platform, streamlining development to support of both POC as well as full-scale production

3 Increase Revenue Opportunities

Capitalize on emerging opportunities at the forefront of digital transformation through the addition of new, innovative use cases to existing products, appeal to a new suite of customers that are searching for AI based solutions, and reduce resource requirements and time-to-market with the unique capabilities of the Edge Vision AI solution

How it Works

Irida Labs end-to-end approach typically starts with a collaborative conversation between Irida Labs and the hardware provider to determine the requirements for the Vision AI application and the Digital Vision Twin creation. This is followed by low-risk engagement on a small scale POV or prototype to ensure the deployment meets the standards for success set by the customer. This lasts 4-8 weeks on average, depending on the visual complexity of the customer environment. Irida Labs engineering team then works closely with the product team to provide support and prepare the Vision AI Solution for the product production phase or in-scale deployment.

On the ground, each camera sensor for the Edge Vision AI Solution is paired with an on-premises processing device that operates as near as possible to the sensor. The processing device is then connected to the PerCV.ai cloud platform, which enables the appropriate off-the-shelf vision AI functionality and the end-to-end infrastructure for the application, data, and device orchestration. Shortly after deployment, the off-the-shelf Vision AI functionality is tailored to the application needs through the PerCV.ai platform. At the end of the short development cycle, the camera is then transformed to a purpose-specific intelligent sensor, and the cloud connectivity is no longer required. All the vision AI processing takes place right at the edge by the on-premises device.

By utilizing with Intel Technology components such as the Intel® Distribution of OpenVINO™ Toolkit, Irida Labs was able to significantly reduce the required time for porting AI into Intel® Movidius™ VPUs, minimize proof of concept deployment efforts, and accelerate time to market and product deployment. Intel® Movidius™ VPUs enable intelligent cameras, edge servers and AI appliances with deep neural network and computer vision-based applications. They empower sensors with the computational resources required to run advanced AI Vision workloads, are easy to integrate, cost efficient, and deliver real-world AI performance to Irida Labs customers.

Customer Success Story: A Catering Equipment Provider Turns to Irida Labs to Facilitate Real Time Identification of Food Tray Contents

Challenge: A company in the catering industry was dealing with extremely large volumes of customers, serving hundreds of thousands of food trays each month. The company was struggling to maintain quality control and reduce food waste as manual inspection was too time consuming and labor intensive, and video monitoring resulted in the need for massive data storage and cloud resources. Vision-AI seemed like a viable solution to address the issue, although it would require enabling both new and legacy equipment with vision AI capabilities to be effective.

Solution: Irida Labs worked closely with a catering equipment provider to develop and deploy a Computer Vision and AI-based Food Tray Inspection Solution powered by Intel® Neural Compute Stick 2 with Intel® Movidius™ Myriad™ X VPUs. The solution enabled Vision AI-based food tray detection, inspection, and analytics, actionable insights based on manageable data, a whole new family of smart appliances, and next-gen remarketing capabilities.

Result: After implementing the Irida Labs Computer Vision & AI-based Food Tray Inspection Solution, the catering company was able to detect food tray content in real-time, standardize the quality inspection process, reduce food waste, and minimize data storage.

Leveraging the Capabilities of Intel® Technology

Intel® Atom® Processors: Find the right balance of performance and cost for your business with Intel Atom® processor C series and P series. These processors offer the power, durability, and scalability needed for modern network infrastructure, network security acceleration, and storage appliances – all in a small footprint.

Intel® Core™ Processors: Intel's highest-performance CPUs for laptops and desktops, Intel® Core™ Processors deliver advanced responsiveness, connectivity, and graphics performance.

“

With our devices processing thousands of food trays / month, human inspection was a struggle for us. Vision AI-based tray inspection not only allowed top quality assurance, but also opened an entire world of analytics used to improve our end-products.”

— Product Development Manager,
Professional Catering Appliances

Intel® Movidius™ VPUs: Enable demanding computer vision and edge AI workloads with efficiency. By coupling highly parallel programmable compute with workload-specific hardware acceleration in a unique architecture that minimizes data movement, Movidius VPUs achieve a balance of power efficiency and compute performance.

Intel® Distribution of OpenVINO™ Toolkit: The high-performance, deep learning inference toolkit provides a full suite of development and deployment tools. The toolkit offers deep-learning models, device portability, and higher inferencing capabilities to offer minimal disruption and maximum performance and enables developers to quickly build, optimize, and scale AI-based computer vision models.

In Summary

Warehouse managers in charge of logistics and administration need ways to overcome the challenges that arise from operational inefficiencies that promote errors and interfere with facility operations. Irida Labs is enabling hardware providers to bridge the gap and solve for these issues by integrating capabilities such as product tracking, inventory reporting, and safety monitoring into their end products through the utilization of AI-powered automation. Irida Labs empowers hardware providers to capitalize on an emerging market with in-demand solutions that deliver real value for their end customers



Learn More

To learn more about the Irida Labs Edge Vision AI Solution visit:

- [Home - Irida Labs - Computer Vision & AI Solutions](#)
- [Intel & Irida Labs: Vision AI Sensor for Inventory Management](#)
- [PerCV.ai Warehouse top down demo](#)
- [Warehouse Management Top Down Product Stacking](#)

To learn about Intel® technologies visit:

- [Intel® Atom® Processors Product Page](#)
- [Intel® Core™ Processors Product Page](#)
- [Intel® Movidius™ VPUs Product Page](#)
- [Intel® Distribution of OpenVINO™ Toolkit Product Page](#)



Sources:

¹[The 2022 MHI Annual Industry Report](#), MHI, 2022

²[The 2021 MHI Annual Industry Report](#), MHI, 2021

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