Solution Brief

intel EDGE INSIGHTS FOR INDUSTRIAL

BlueSkies.AI, Lenovo, and Intel Team to Deliver AI-as-a-Service for Industry 4.0

BlueSkies.AI simplifies machine vision with subscription offering of Lenovo systems optimized with Intel® processors and Intel® Edge Insights for Industrial (EII) software.

"AI-based machine vision applications for quality control are effective solutions that can replace manual inspection and are far more accurate at a fraction of the cost. We provide an optimized solution as a service, saving our customers up front capital investment and time-to-implementation."

— Ted Connell
Founder and CEO
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AI-as-a-Service enables new heights of productivity for manufacturers

As manufacturers turn to automation to drive new levels of productivity, efficiency, and reduced costs, AI-based machine vision applications stand out as one of the more mature and available solutions for near-term Return-on-Investment (ROI). So much so that applications based on this technology are predicted to power what will be a $13 billion market by 2025[1]. Some of the critical applications driving the growth of the machine vision market include the increasing need to automate inspection to improve accuracy, reducing risks by automating compliance, and increasing focus on worker safety.

The addition of AI-based machine vision generates significant new capabilities. Specifically, AI-based deep learning algorithms enable systems to actually recognize and compare objects, then record these observations in an internal database. By doing so, these systems can identify potential problems before they occur, remove defective products from an assembly line, sound an alarm if a worker may be at risk, and tirelessly document policy compliance.

Machine vision's benefits to manufacturers are myriad: machine vision lowers risks in industrial environments because it can recognize dangerous behavior and stop it before the accident occurs. Machine vision-based applications running on ruggedized, fanless edge Industrial PCs (IPCs) attached to high-resolution digital cameras can inspect products far more accurately and at far greater line speeds than manual inspection.

However, implementing machine vision-based applications are easier said than done. Significant expertise in AI, software, hardware integration, and more is required to implement these systems successfully. Organizations need to "train" their algorithms and build AI-based systems to deliver the results they need. Manufacturers often do not possess this expertise in-house and thus require outside consultation to get a project up and running. Even then, many manufacturers can find it challenging to justify the capital expenditures for what, at first, may be perceived as a pilot system with limited use.

Manufacturers need a new model to invest in machine vision-based applications

BlueSkies.AI has partnered with Lenovo and Intel to deliver solutions for AI-driven machine vision applications that eliminate the barriers around in-house expertise, capital expenditures, speed of implementation, and scale. Specifically, BlueSkies.AI is pioneering a unique, AI-as-a-Service (AIaaS) model for machine vision applications. For example, BlueSkies.AI enables companies to quickly deploy solutions like automated inspection of typical pharmaceutical packaging without concern over the cost and maintenance of new hardware or the challenge of training their AI models.

BlueSkies.AI helps create situational awareness using AI Vision to surface events and prevent problems. A business model and technology platform built on Intel enables the firm to scale its solution quickly. By doing so, it allows its clients to help improve quality control, workplace safety, and compliance.

AIaaS-based solutions from BlueSkies.AI, combined with the compact Lenovo ThinkEdge SE30 equipped with a powerful Intel CPU and Intel® Edge Insights for Industrial (EII), provide companies with three primary business benefits. First, the end-user's costs are dramatically lowered, as BlueSkies. AI maintains the hardware and manages the models themselves. Second, the BlueSkies. AI provides end-users with real-time data in digital format that can be used to optimize their operations. Third, with the Lenovo ThinkEdge SE30 the solutions are able to scale and deploy globally.

The specific use cases for BlueSkies.AI's AIaaS include:

Product and production line inspection—Production lines are moving too fast for people to accurately inspect, which results in poor quality in the field or expensive manual inspection. Edge IPCs running AIaaS solutions are far superior than human operators in these instances, as AI-based machine vision systems can find the defects people cannot.

Automation for data collection to ensure compliance—To maintain compliance, manufacturers often have to send employees into the facility to manually record data and enter it into a system to track compliance, usually on a spreadsheet. These files are shared manually with auditors and regulators. BlueSkies.AI can automate data collection less expensively than manual data collection, and the data is available in real time in a digital format to use by BlueSkies. AI's clients.

Automate systems to ensure worker safety—Worker safety is usually not monitored except when supervisors happen to notice a PPE infraction. Worker safety incidents can be a high cost and risk exposure to industrial companies. BlueSkies. AI can deploy a system that will immediately send alerts or sound alarms when PPE is not correct, or workers are behaving in an unsafe way.

BlueSkies.AI, Lenovo, and Intel support multiple implementations

To accelerate time-to-market and improve performance of its machine vision deployments, BlueSkies. AI optimized and incorporated Intel software technologies into its solution. The result is a robust solution architecture that can flexibly meet the needs of any manufacturer that needs automated quality control inspection.

BlueSkies.AI can support these types of implementations:

- **BlueSkies.AI VPN:** Along withthe Lenovo ThinkEdge SE30 running BlueSkies.AI VPN over the vendor or public network at the facility. BlueSkies.AI never touches the clients' network. APIs are used to send information between the BlueSkies.AI system and the clients' systems.
- **Behind the Clients' Firewall:** The Lenovo ThinkEdge SE30 runs on the client's network. The client ensures the security of the PC and allows BlueSkies.AI access to the edge IPCs for management.

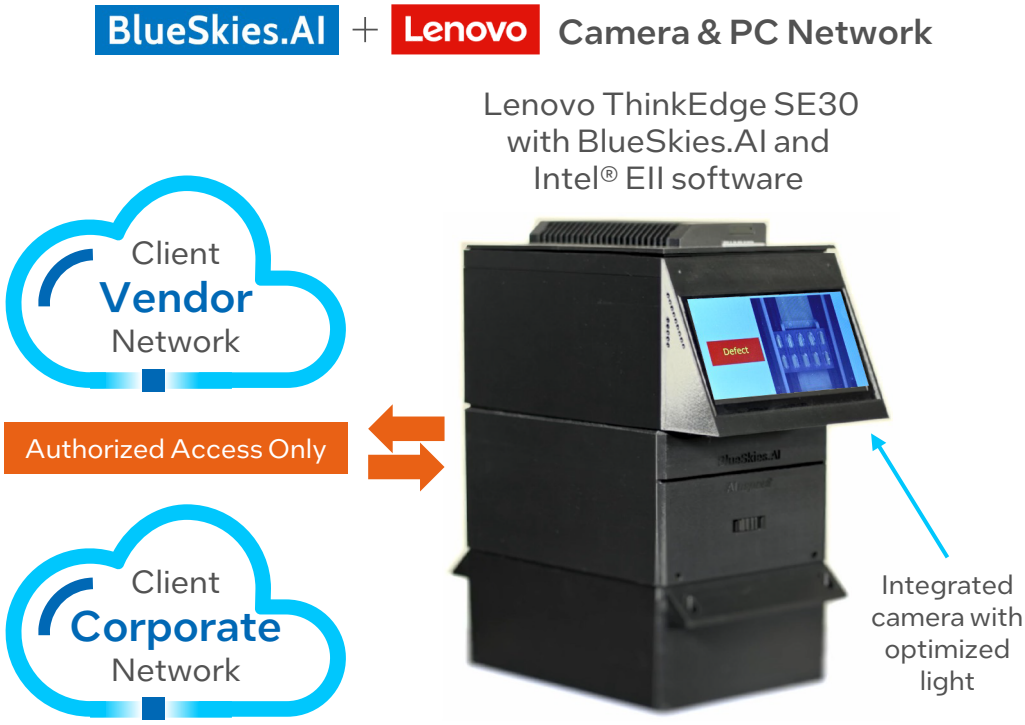

Figure 1. Example of an inspection solution with BlueSkies.AI Ainspect solution with Lenovo ThinkEdge SE30 and BlueSkies.AI and Intel EII software.

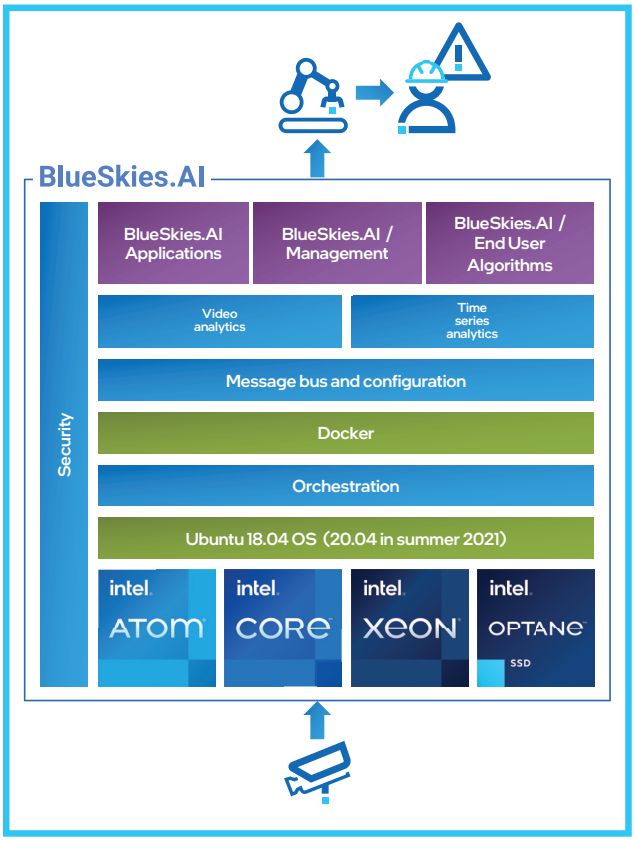

Figure 2. BlueSkies.AI and Intel® Edge Insights for Industrial work together to deliver tablet packing and inspection.

BlueSkies.AI leverages Intel silicon and Edge Insights for Industrial (EII) software

To provide its AI-as-a-Service offering, BlueSkies.AI leverages the small footprint and just the right I/O ports provided by Lenovo's ThinkEdge SE30 built with Intel silicon as well as Intel's Edge Insights for Industrial (EII) software. EII in particular, is widely utilized as a part of BlueSkies.AI's service offering. EII is made up of a battle-tested software stack that enables service providers like BlueSkies.AI, System Integrators (SIs), Independent Software Vendors (ISVs), and equipment manufacturers (e.g., IPC manufacturers, machine builders, etc.) to more securely ingest, analyze, and store video and time-series data. EII, which is based on an open and flexible microservices-based architecture, is optimized for Intel-based hardware and silicon solutions. This is important since BlueSkies.AI makes extensive use of Intel software and silicon technologies in its solution offerings.

In the case of BlueSkies.AI, many of its customers do not want to have to program or develop an edge inferencing software. BlueSkies.AI AI-as-a-Service masks the underlying complexity and eliminates the capital cost but still delivers all of the power and functionally of Intel's most compelling AI and edge software solutions, all of which run on standard Intel-based systems, like the Lenovo ThinkEdge SE30. This last point—running on readily available commercial systems—truly enables manufacturers to lower their costs by using existing hardware solutions and easily build their own custom AIaaS solutions without having to wait on other vendors to incorporate this functionality.

About the Lenovo ThinkEdge SE30

The Lenovo ThinkEdge SE30 fits within the small footprint of BlueSkies.AI's solution design and has the correct I/O ports right out of the box. The SE30 comes equipped with powerful 11th Gen Intel® Core™ processors for faster, smoother data processing that is essential to AI applications. With Lenovo's readily available product, robust supply chain, worldwide certifications, and extended lifecycle and support through the Lenovo OEM capabilites model, organizations can quickly scale solutions.

Conclusion

AI-powered machine vision applications represent a significant opportunity for manufactures to help make it a safer workplace, improve quality, and reduce costs, a win-win-win, and do it as a service. Intel and BlueSkies.AI have created an end-to-end solution suite combined with expert implementation and optimization services to meet individual organizations' unique needs.

Learn More:

- Intel® Distribution of OpenVINO™ toolkit
- Intel® Edge Insights for Industrial
- BlueSkies.AI
- Lenovo Edge Solutions

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[1] MarketsandMarkets Research, 2020 https://www.marketsandmarkets.com/PressReleases/industrial-machine-vision.asp