Electronics Giants Tap Into Industrial Automation With NVIDIA Metropolis for Factories

Leading Taiwanese manufacturers — including Foxconn Industrial Internet, Pegatron, Quanta and Wistron — are adopting Metropolis for Factories to handle automated optical inspections.

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The $46 trillion global electronics manufacturing industry spans more than 10 million factories worldwide, where much is at stake in producing defect-free products. To drive product excellence, leading electronics manufacturers are adopting NVIDIA Metropolis for Factories.

More than 50 manufacturing giants and industrial automation providers — including Foxconn Industrial Internet, Pegatron, Quanta, Siemens and Wistron — are implementing Metropolis for Factories, NVIDIA founder and CEO Jensen Huang announced during his keynote address at the COMPUTEX technology conference in Taipei.

NVIDIA Metropolis for Factories is a collection of factory automation workflows that enables industrial technology companies and manufacturers to develop, deploy and manage customized quality-control systems that offer a competitive advantage.

Manufacturers globally spend more than $6 trillion a year in pursuit of quality control, and they apply defect detection on nearly every product line. But manual inspections can’t keep up with the demands.

Many manufacturers have automated optical inspection (AOI) systems that can help, but often these have high false detection rates, requiring labor-intensive and costly secondary manual inspections in an already challenging labor market, reducing their value.

NVIDIA Metropolis for Factories now offers a state-of-the-art AI platform and workflows for the development of incredibly accurate inspection applications such as AOI.

Leading manufacturer Pegatron , based in Taipei’s Beitou district, is using NVIDIA Metropolis for Factories on its production lines.

Pegatron manufactures everything from motherboards to smartphones, laptops and game consoles. With a dozen manufacturing facilities handling more than 300 products and more than 5,000 parts per day, Pegatron has a lot of quality control to manage across its product portfolio. Further, frequent product updates require ongoing revisions to its AOI systems.

Pegatron is using the entire Metropolis for Factories workflow to support its printed circuit board (PCB) factories with simulation, robotics and automated production inspection. Metropolis for Factories enables the electronics manufacturing giant to quickly update its defect detection models and achieve 99.8% accuracy on its AOI systems, starting with small datasets.

Pegatron uses NVIDIA Isaac Sim , a robotic simulator, to program robotic arms in simulation and to model the performance of its fleets of mobile robots.

Tapping into NVIDIA Omniverse Replicator provides synthetic data generation to simulate defects, helping build massive training datasets with domain randomization and other techniques.

In Metropolis, NVIDIA TAO Toolkit allows Pegatron to access pretrained models and transfer learning to build its highly accurate defect detection models from its enhanced datasets.

The NVIDIA DeepStream software development kit can be used to develop optimized intelligent video applications that handle multiple video, image and audio streams. Using DeepStream, Pegatron was

able to achieve a 10x improvement in throughput.

Moreover, Omniverse enables Pegatron to run digital twins of its inspection equipment, so it can simulate future inspection processes, promising increased efficiencies to its production workflow.

It's also used by Quanta subsidiary Techman Robot , which taps Isaac Sim to optimize the inspection of robots by robots on their manufacturing line.

Metropolis for Factories is helping manufacturers like Pegatron to increase production line throughput, reduce costs and improve production quality.

Metropolis for Factories can be deployed from the enterprise industrial edge to the cloud, and a large and growing ecosystem of partners is helping bring it to market.

A host of specialists are joining forces on this effort including sensor makers, application partners, inspection equipment makers and integration partners.

Basler, a leading maker of imaging sensors and systems, has partnered with NVIDIA to help developers build AI-enabled inspection systems faster through tighter integration with the NVIDIA DeepStream SDK.

Quantiphi, a Metropolis partner, is working with one of the world's largest beverage producers to automate inspections of fully packed pallets with GPU-powered vision AI.

Overview and Advantech — both NVIDIA Metropolis partners — are collaborating to build a real-time AI-based inspection system to support industrial inspection, product counting and assembly verification.

Metropolis partners Siemens and Data Monsters are working together to build industrial inspection systems, bringing together Omniverse Replicator synthetic data generation, NVIDIA TAO training, DeepStream runtime and Siemens' NVIDIA Jetson-powered industrial personal computers.

Learn more about NVIDIA Metropolis for Factories .

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