

Accelerated Computing is Accelerating Industrial Digitalization

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AI Development Division.

2024, Mar. 20 (Wed.) 8:00 AM – 8:50 AM (PDT)

PEGATRON

ASUS®
IN SEARCH OF INCREDIBLE



AGENDA

1 From Automation to Autonomy

10 mins

2 AI is Accelerating Industrial Digitalization

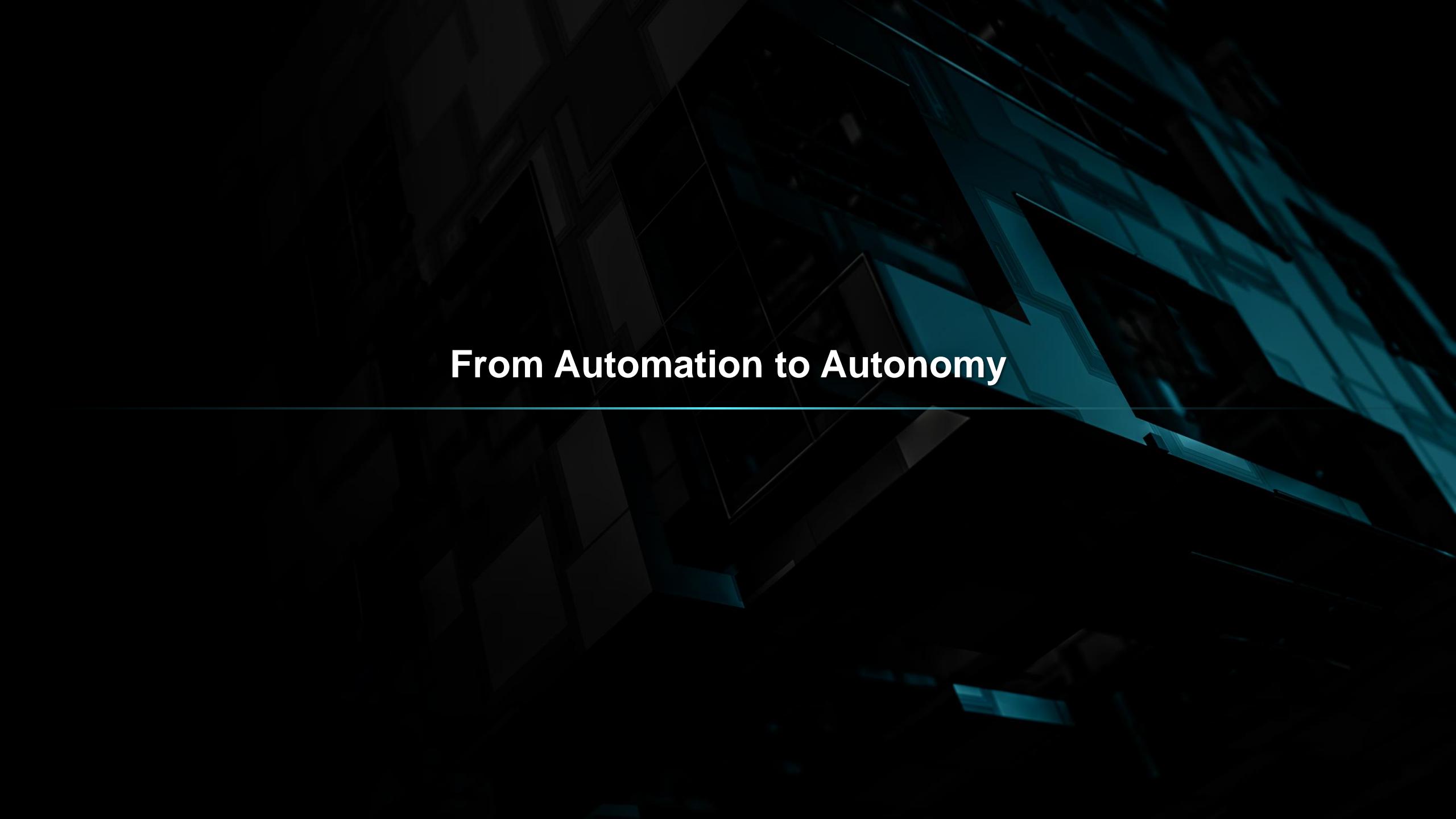
15 mins

3 DigitalTwins is Accelerating Industrial Digitalization

15 mins

4 Q & A

10 mins



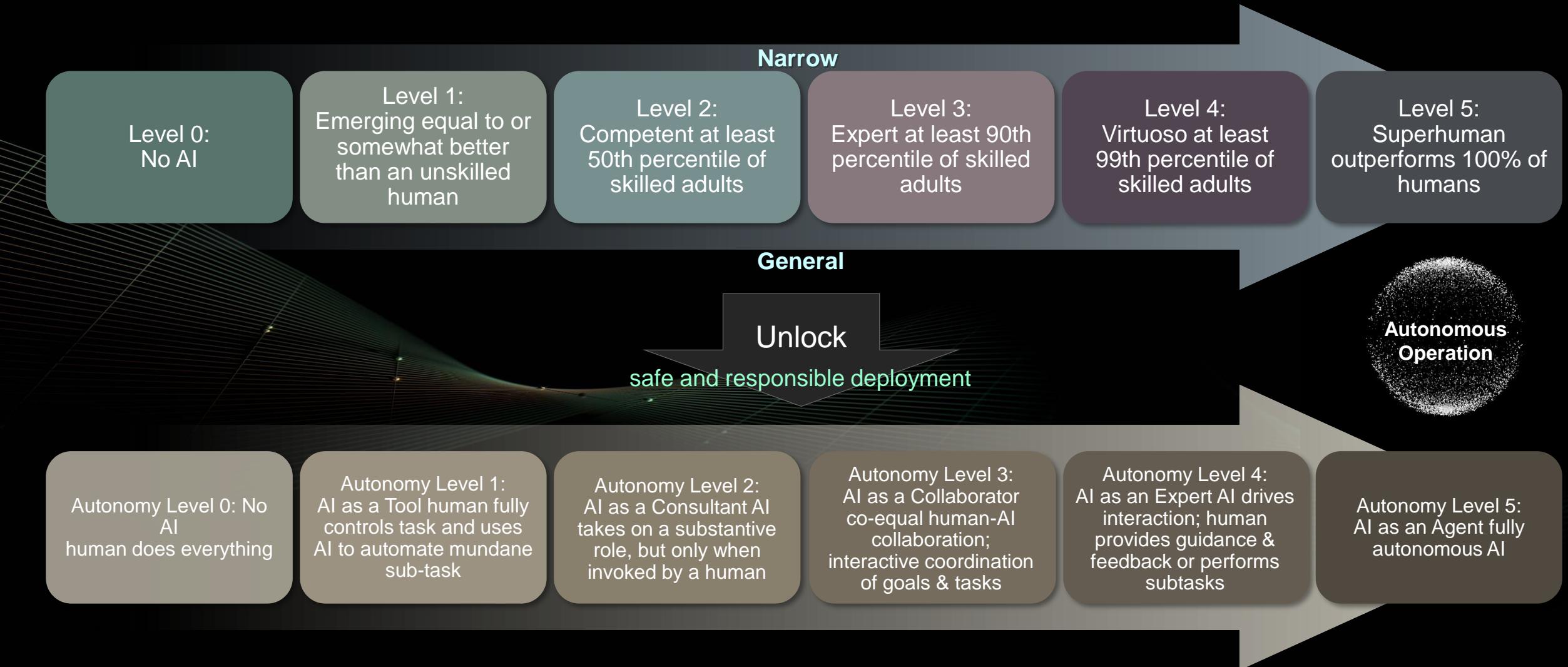
From Automation to Autonomy



PEGATRON SMART MANUFACTURING AND AUTOMATION OF LAPTOP

Pegatron Smart Factory

Levels of AGI: Operationalizing Progress on the Path to AGI



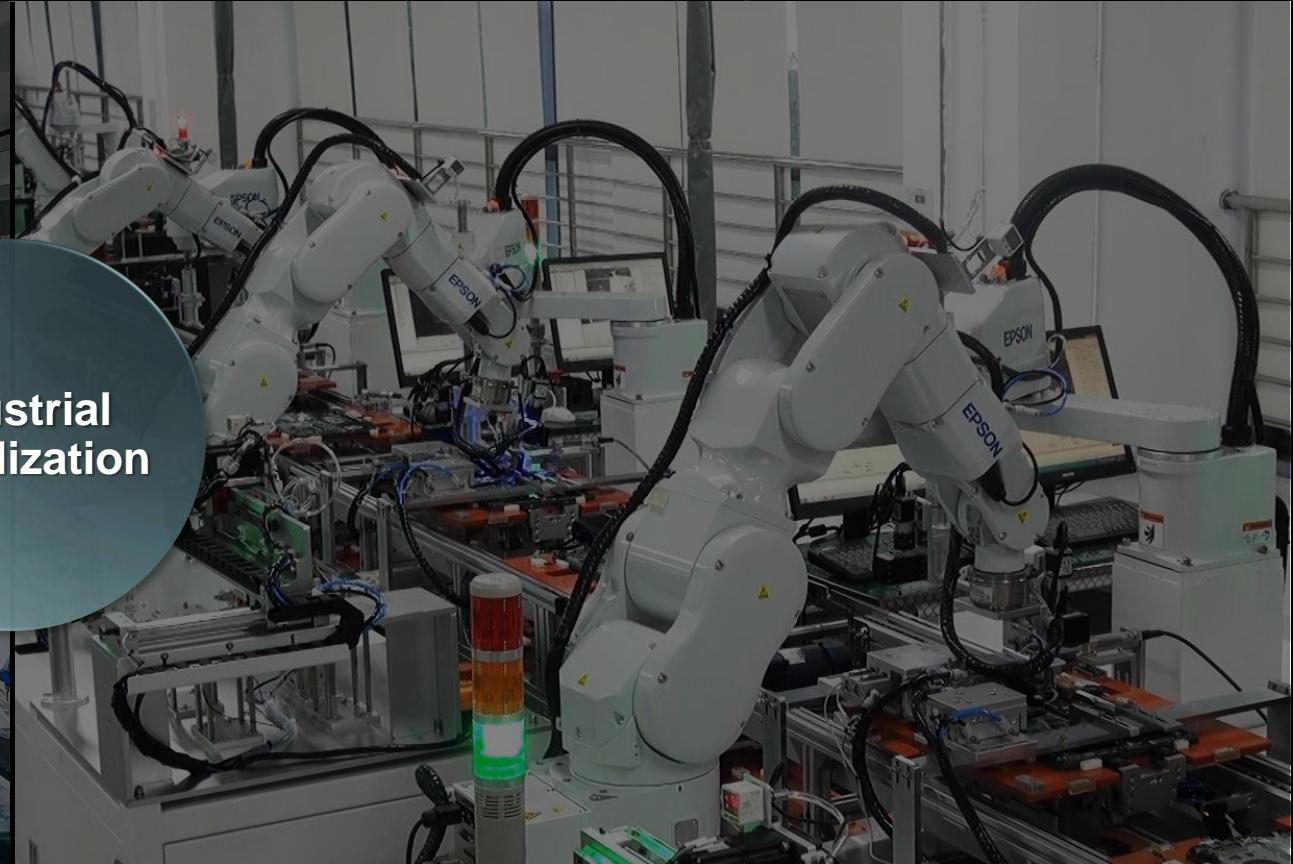
Digitalization Is The Path Toward Autonomy

~ 2014

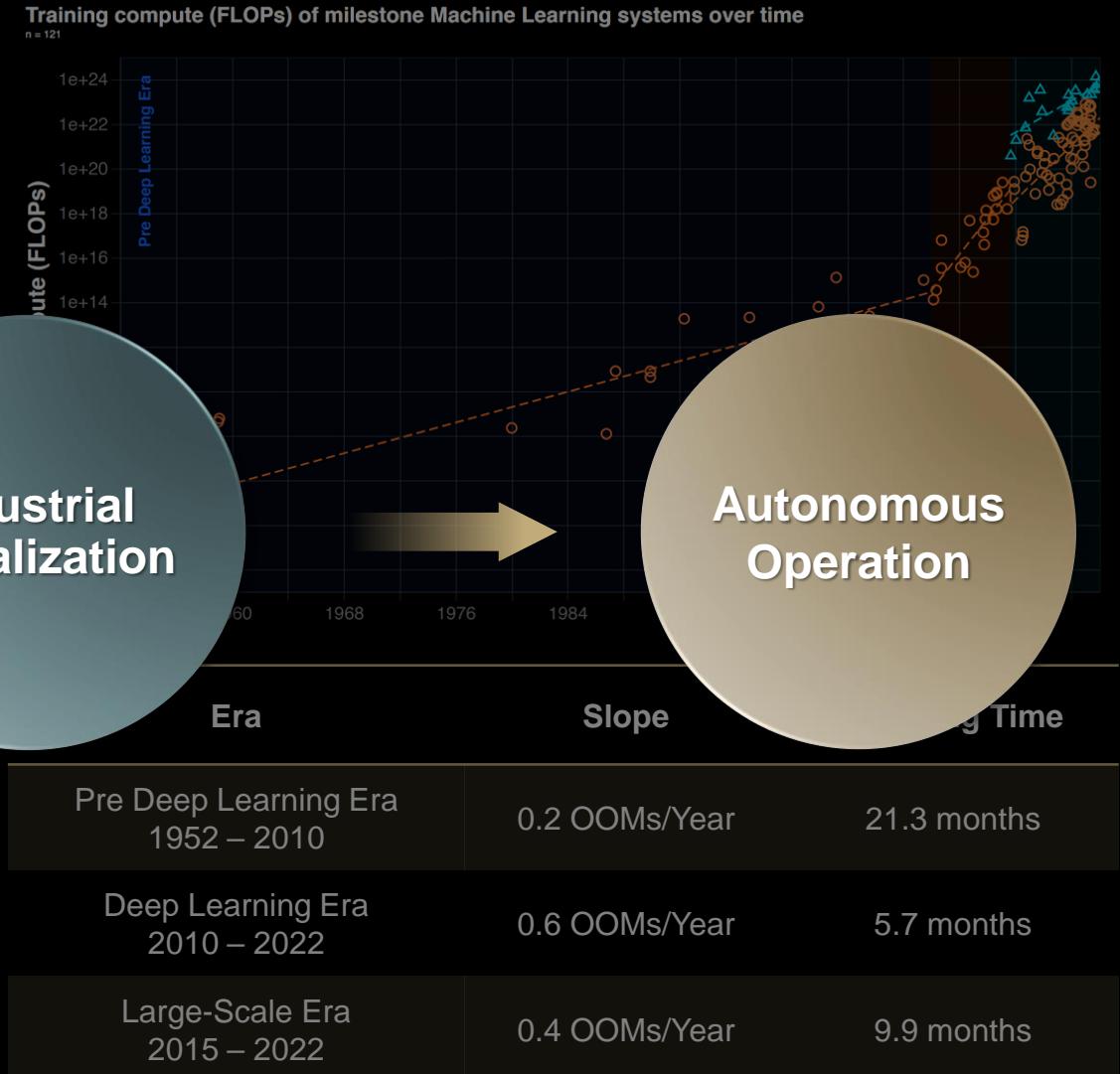
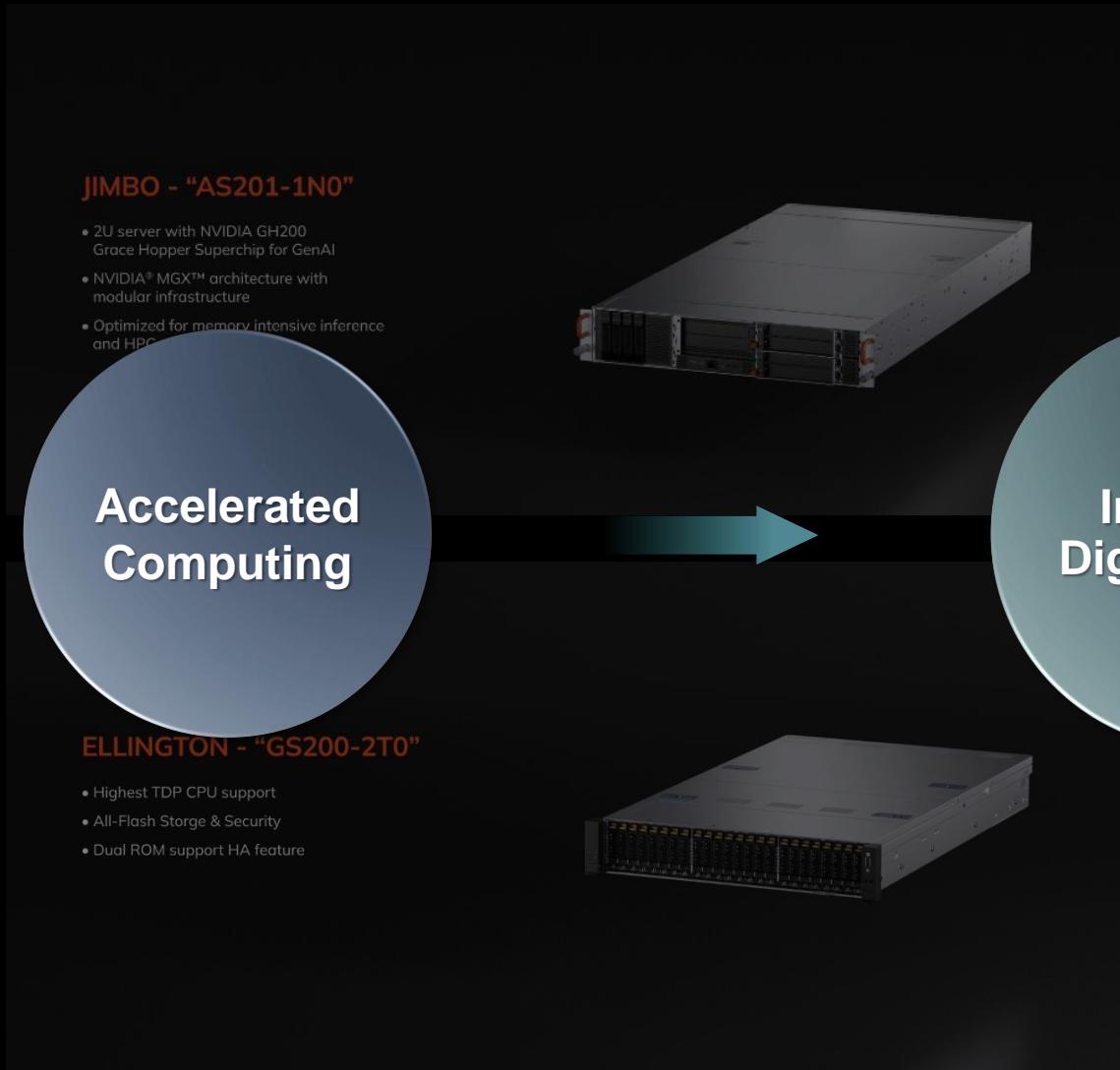


Industrial
Digitalization

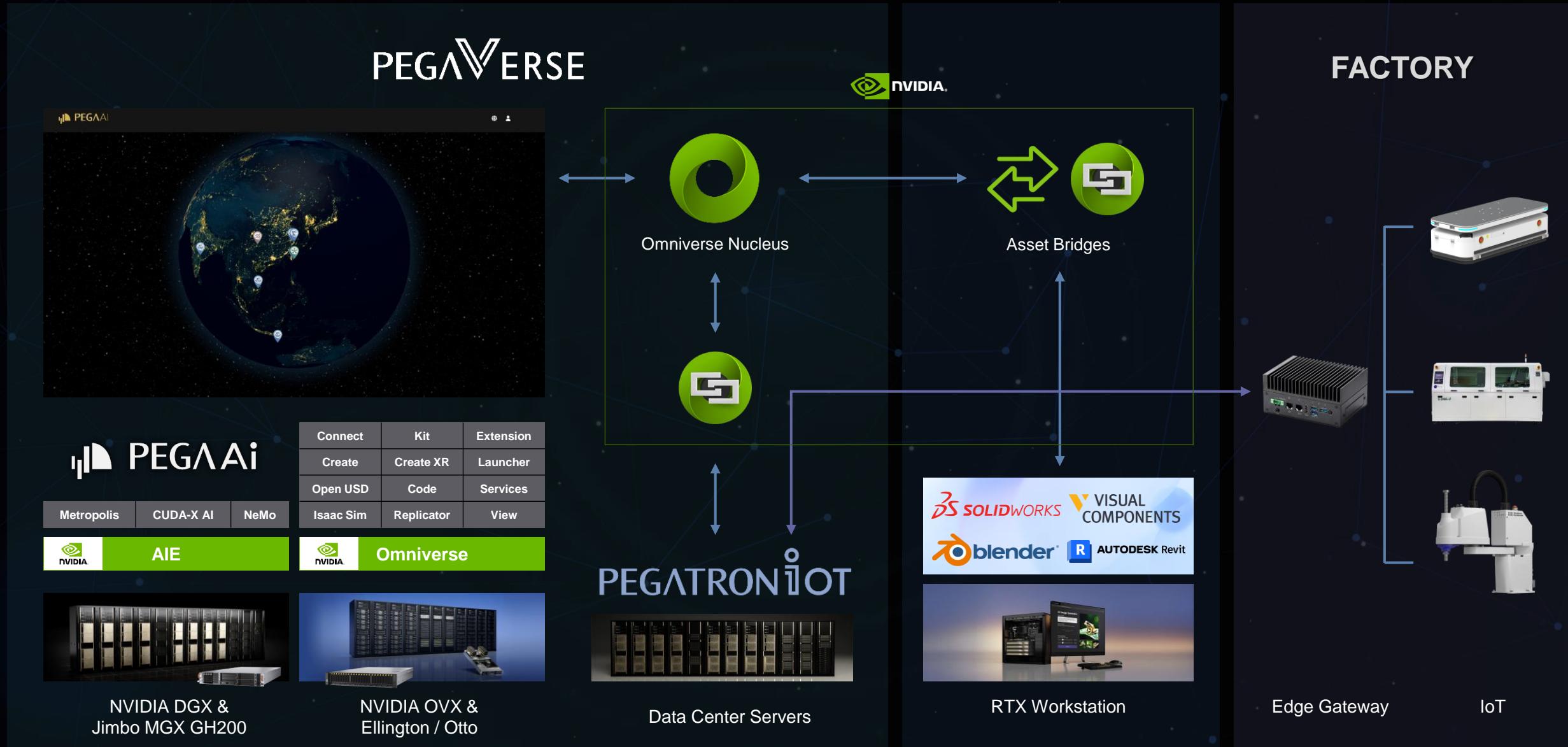
~ 2024



Accelerated Computing Is Accelerated Industrial Digitalization



Accelerated Computing Architecture For Industrial Digitalization





AI is Accelerating Industrial Digitalization

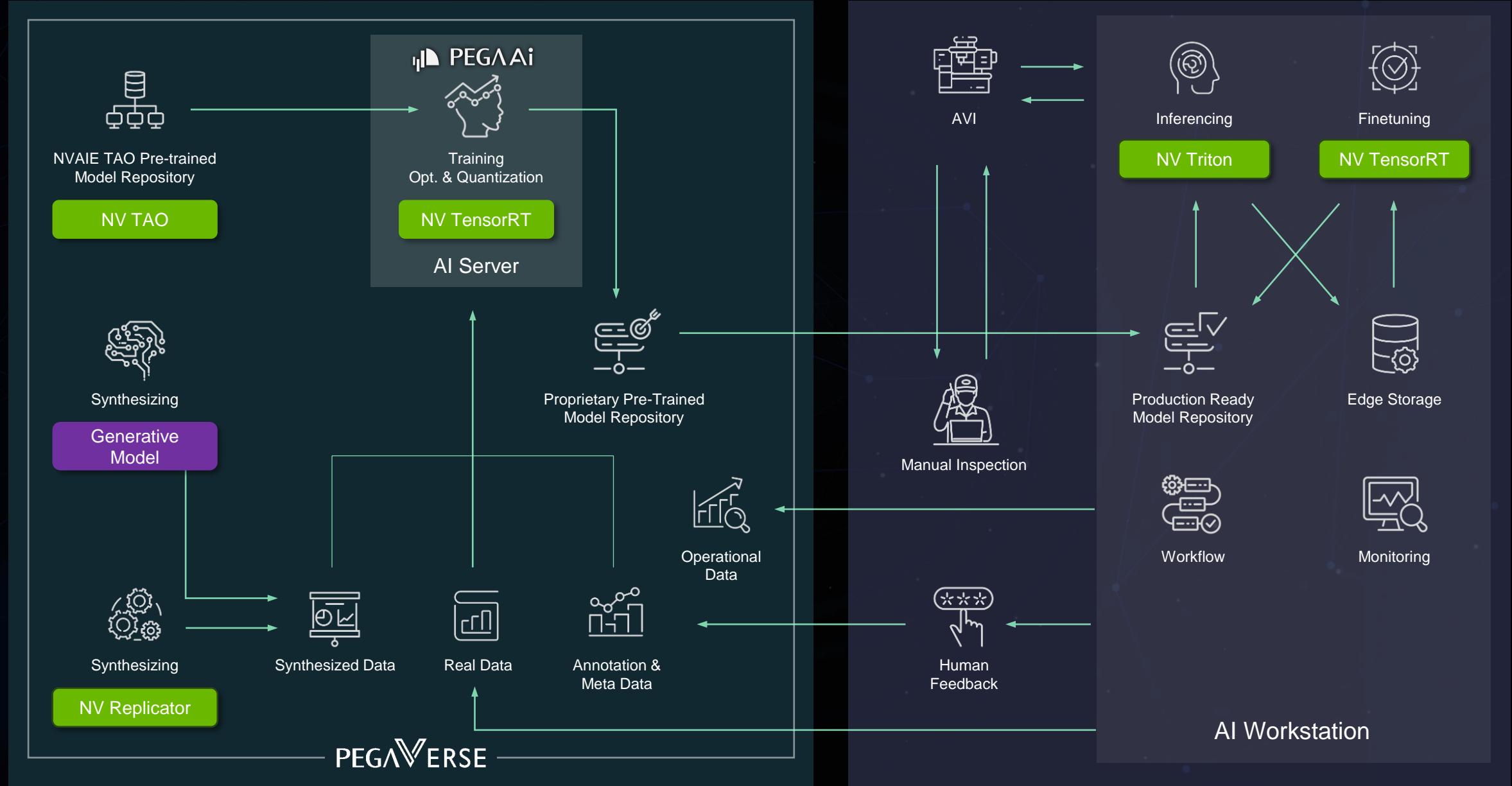


Show Case
AI-Driven Smart Manufacturing Evolution



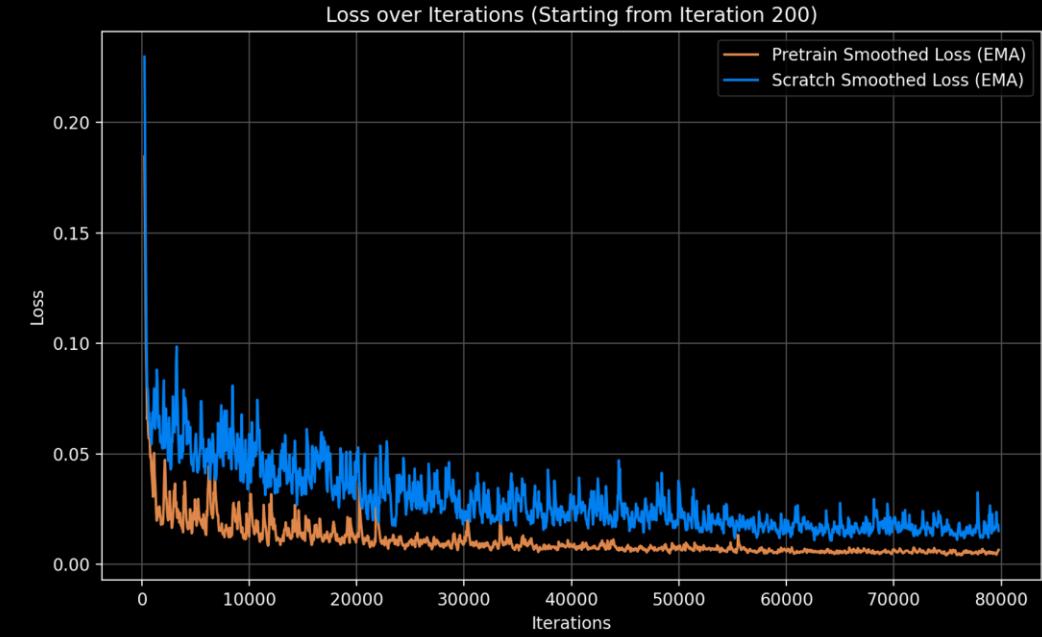
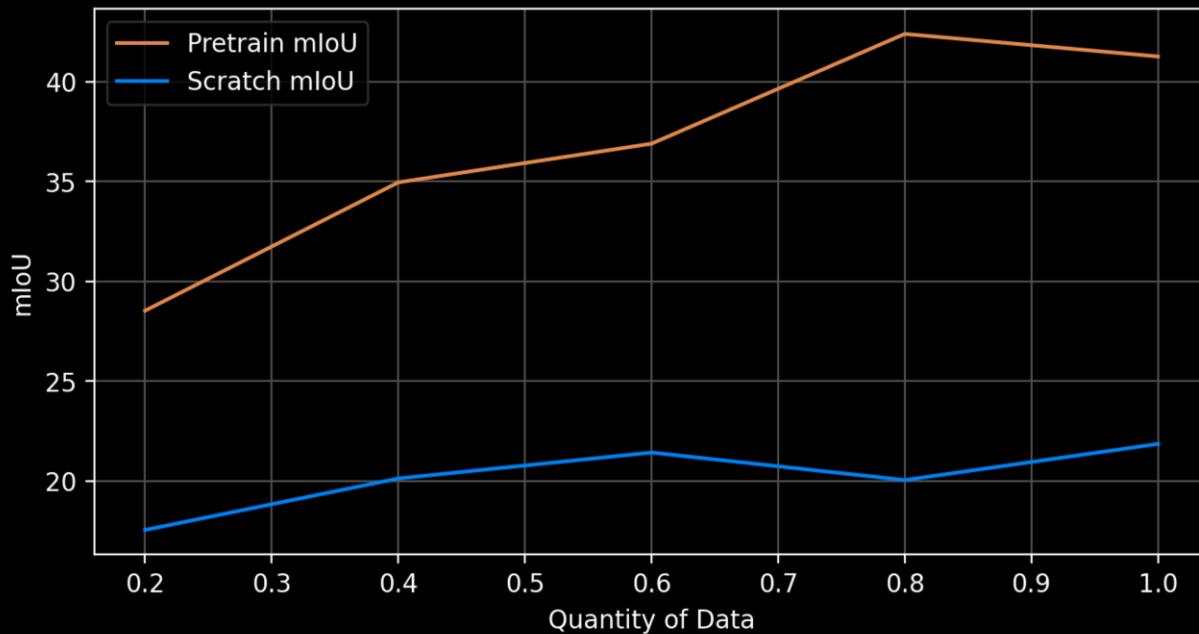
On-Prem Cloud

Factory



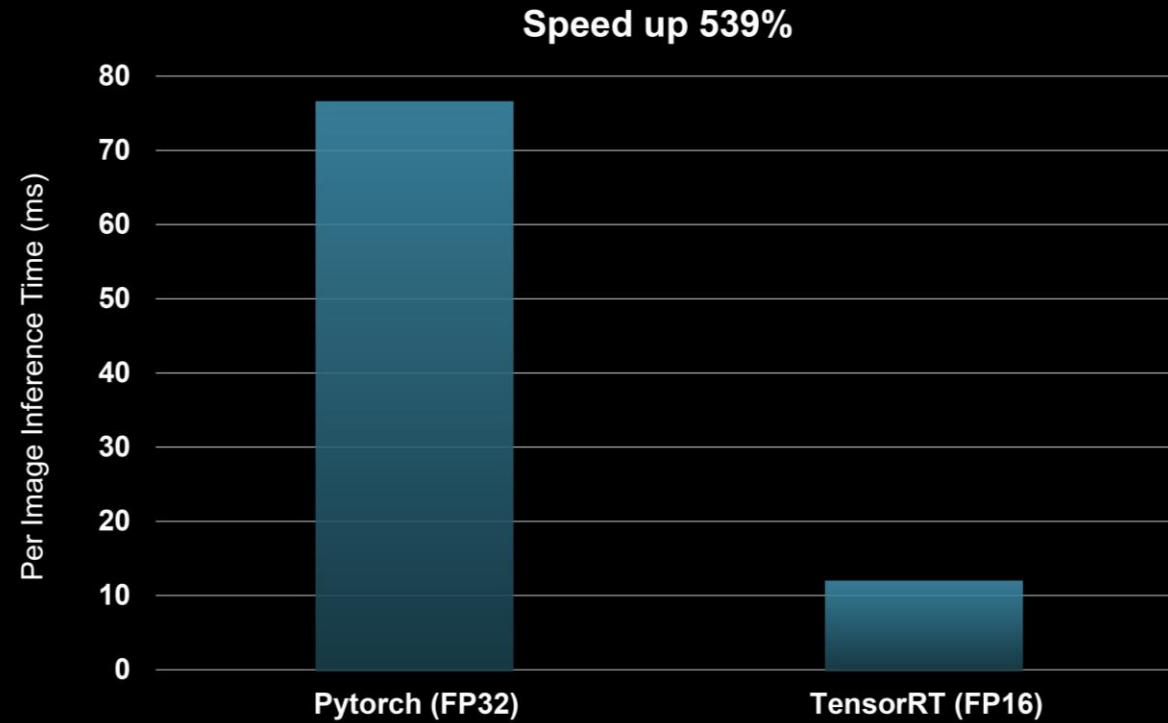
Challenges with Data Collection for Training AI Models

- Having a small but diverse range of products, it is challenging to accumulate extensive data over an extended period.
- How can we train a high-performance model within the constraints of limited training data?
- We utilize the pretrained weights provided by [Nvidia Metropolis / TAO](#) for transfer learning training.
With the same amount of data, the performance surpasses that of training without using pretraining



Inference on Massive Data

- The factory generates up to **five million** images daily for inference.
- How can we increase inference speed and production capacity without additional hardware purchases?
- Applied **Nvidia Metropolis / TensorRT**, speed up **539%** on the existing hardware infrastructure.



PEGA AI

PEGA AI, the end-to-end collaborative No Code/Low Code AI platform developed by PEGATRON. Notably, PEGA's impressive capabilities shine through as it seamlessly enables round-the-clock operations on a grand scale, resulting in enhanced quality and efficiency across operations.

NVIDIA Metropolis

The screenshot displays the PEGA AI platform interface. At the top, there is a navigation bar with links for SOLUTIONS, WORKSPACE, DATASETS, DIGITAL ASSISTANT, PLAYGROUND, and user profile icons. Below the navigation bar, there are sections for 'Shop' (42 items), 'My Solutions' (6 items), and 'All Solutions' (1510 items). A search bar and a 'Text' dropdown are also present. The main content area is divided into three rows of AI solution cards. Row 1: 'AI Intelligent Customer Service' (image of a woman on a phone), 'AI Intelligent Data Search' (image of a person writing on a clipboard), 'AI Intelligent Reading' (image of an open book), and 'Automatic Invoice Filling System' (image of an invoice document). Row 2: 'Cambrian Tutorial' (image of a brain circuit board), 'Charging Port Defect Detection' (image of a smartphone with a green overlay), 'Component AOI' (image of a barcode and a component), and 'Component Inspection' (image of a circuit board). Row 3: 'Component Inspection v2' (image of a lab setup), 'CPU Socket Pin Defect Detection' (image of a CPU chip with a red box highlighting a defect), 'Defect Detection' (image of a dark surface with a purple box labeled 'defect'), and 'Email Filtering' (image of hands typing on a laptop keyboard).

AI-based Vision Applications in Pegatron Factories

Industrial Digitalization:

- Autonomy Level: 1
- Recall Rate: AI \geq Labor Level
- AI adoption rate CAGR: ~300%



AIE - Metropolis

- No Code / Low Code MLOps
- Scalable Deployment
- Ready To Use

Cosmetic AOI



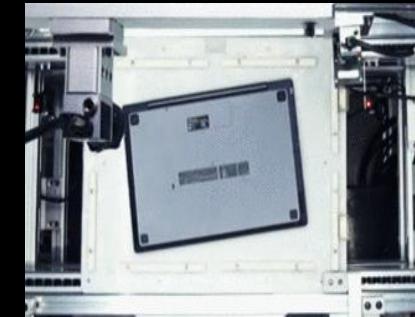
Assembly Inspection



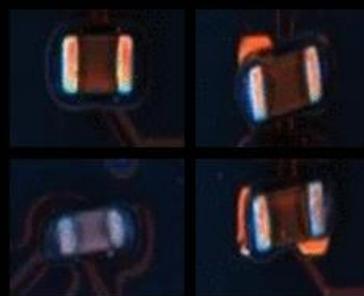
Soldering Inspection



Screw Localization



SMT AOI Re-inspection



Label Inspection



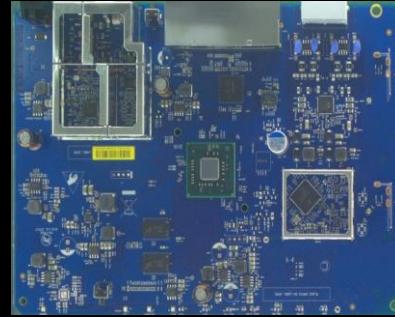
Cosmetic AOI



Stick Foam



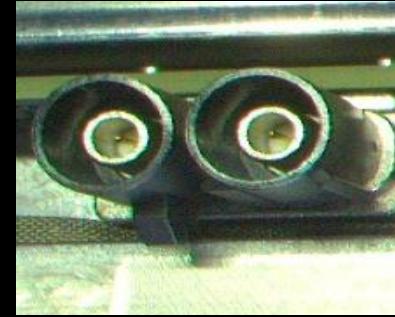
Component AOI



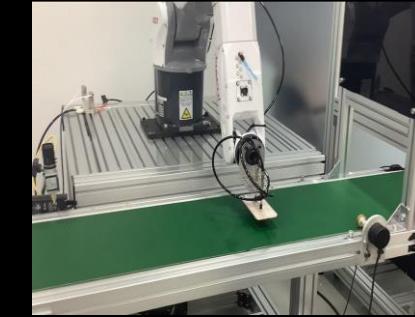
Keyboard



Connector Inspection



Pick & Place On The Fly

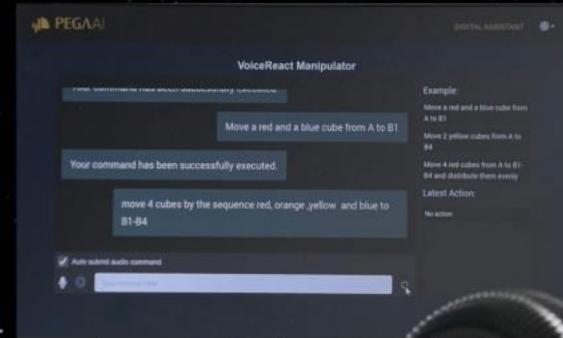


PEGAVERSE

PEGAAI



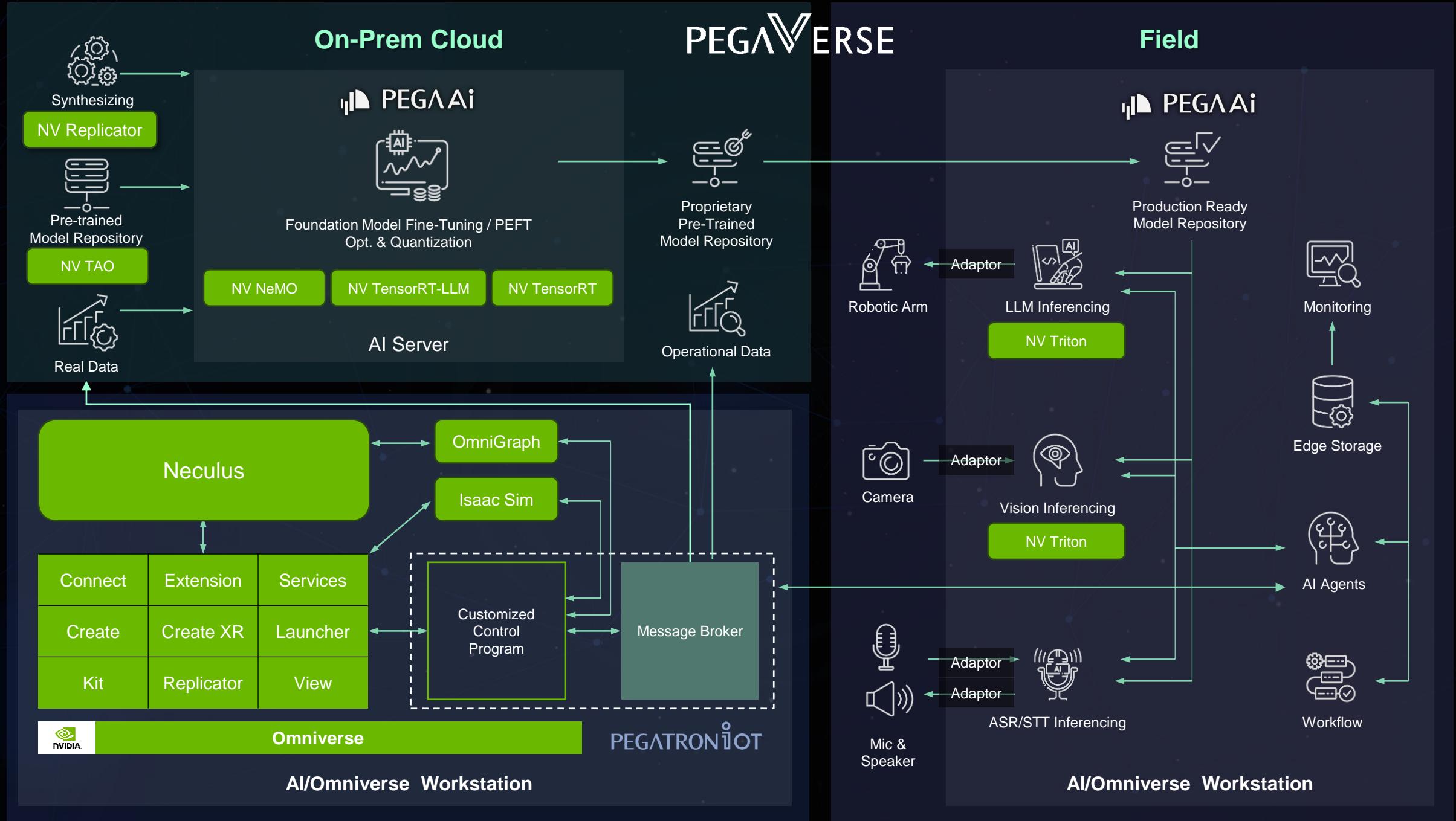
LLM



Digital Twins



and Digital Twins to develop an automated picking system with generative AI.



The background of the slide features a dark, abstract geometric pattern composed of numerous small, sharp-edged triangles. These triangles are primarily black, set against a slightly lighter dark gray background. Interspersed among them are several larger, translucent blue triangles that appear to be glowing from within, creating a sense of depth and light. The overall effect is futuristic and high-tech.

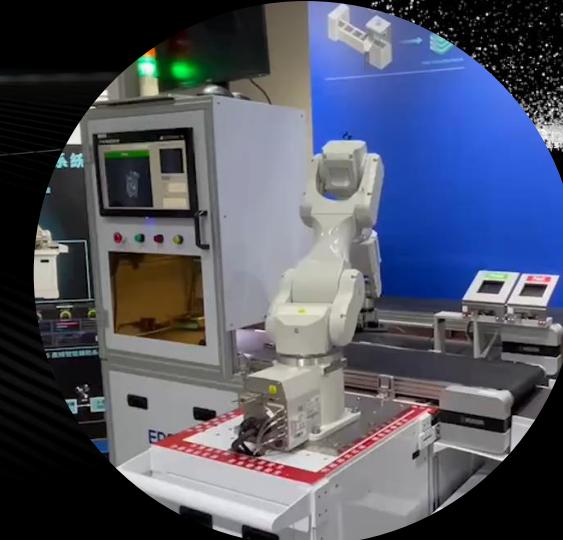
Digital Twins is Accelerating Industrial Digitalization

Digital Twins AI Inspection System



Cyber Space

Real Time Synchronization



Physical Space

Industrial Digitalization

Digital Twins			AI			IoT	5G
Real Time Synchronized	Remote Control	Log Replay	Component AOI	Catch on the fly	Barcode Reader	IoT Platform integrated	MEC integrated

The AI Automatic Inspection Digital Twins is a pilot project to demonstrate power of integration of all technology. It can be deployed globally and controlled by one center.

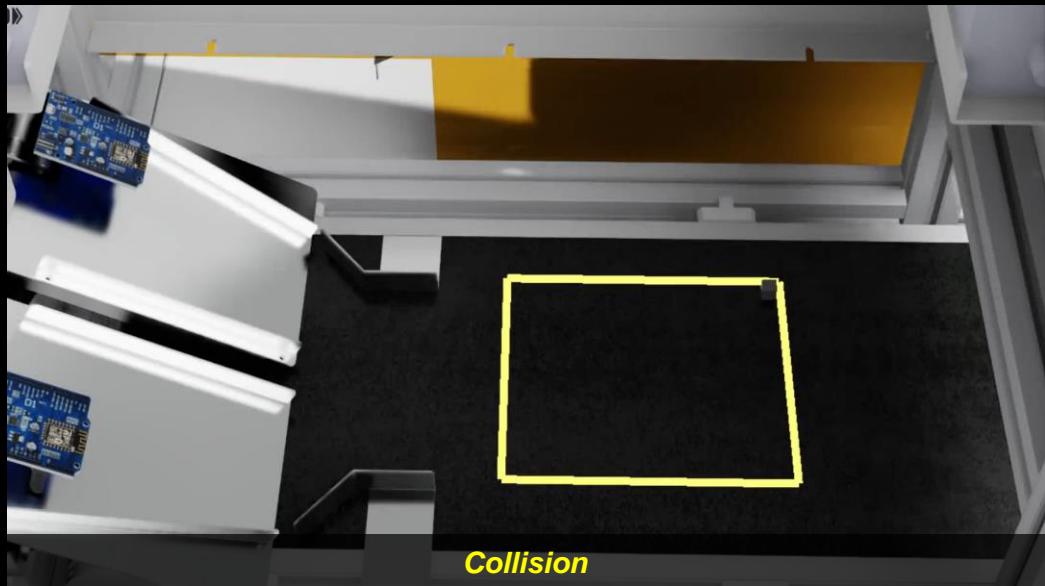


Physical Space

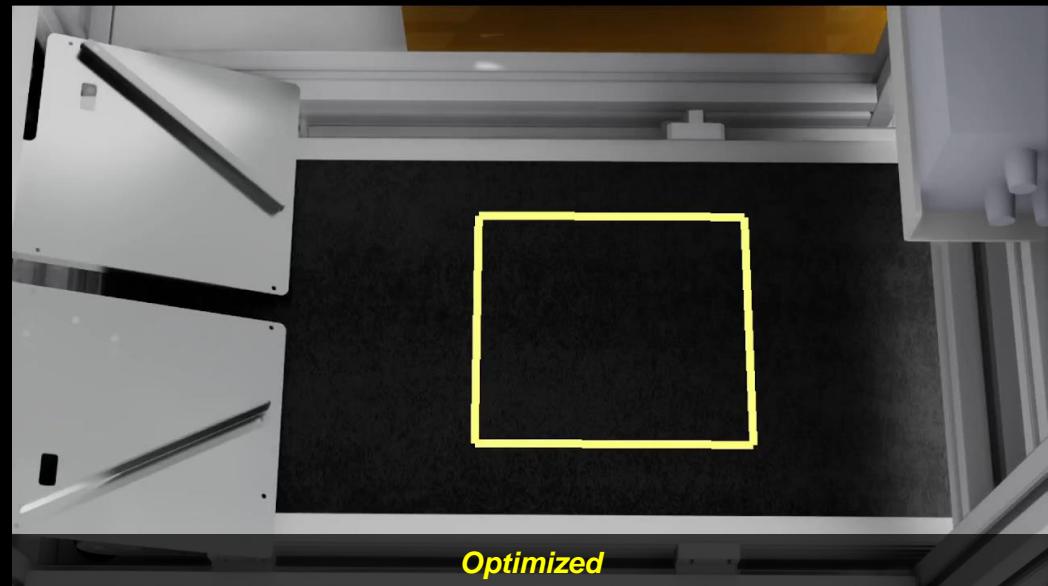


Cyber Space

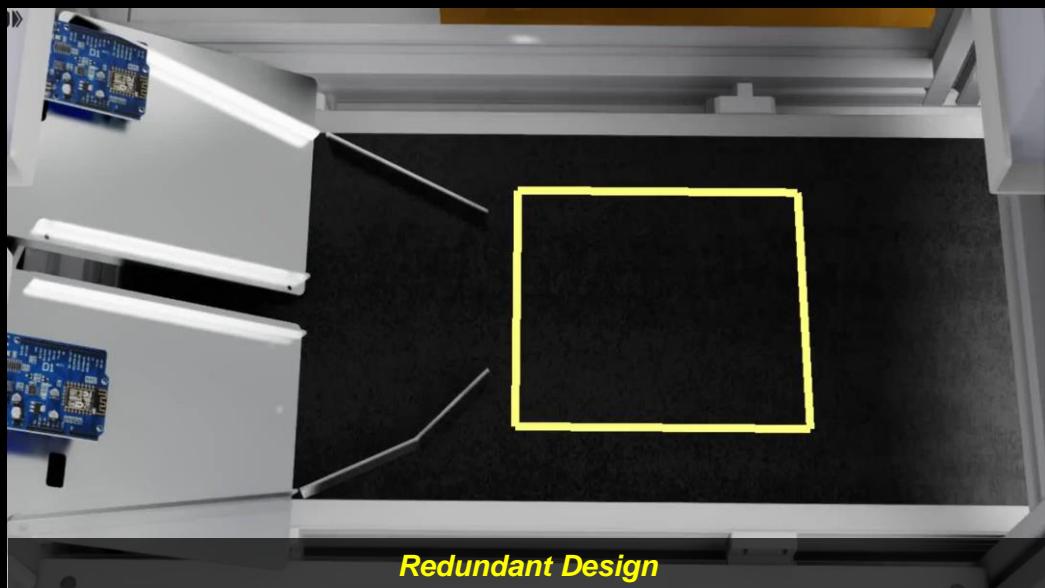
Planning, Designing , and Optimizing before Construction



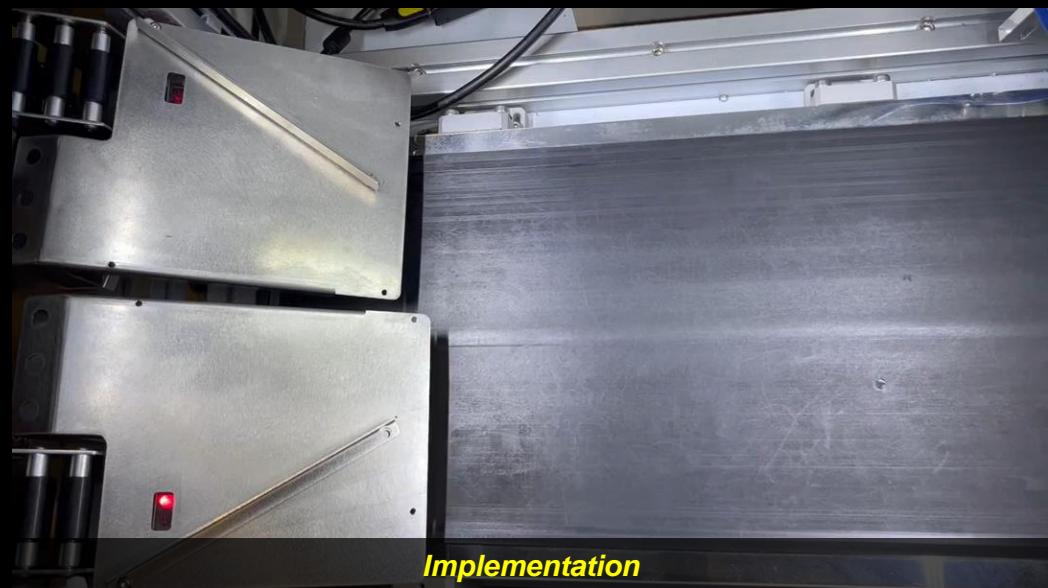
Collision



Optimized

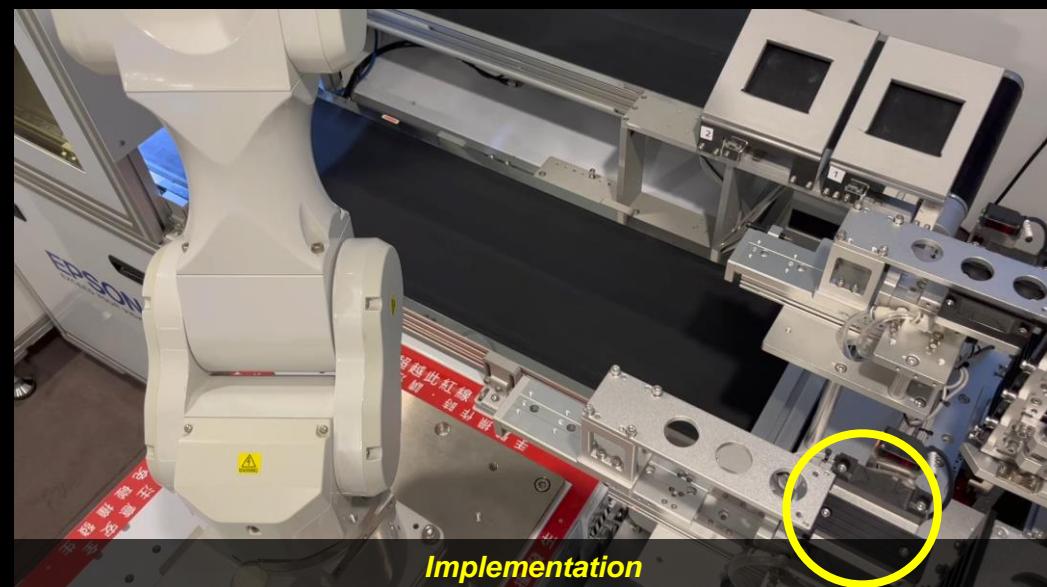
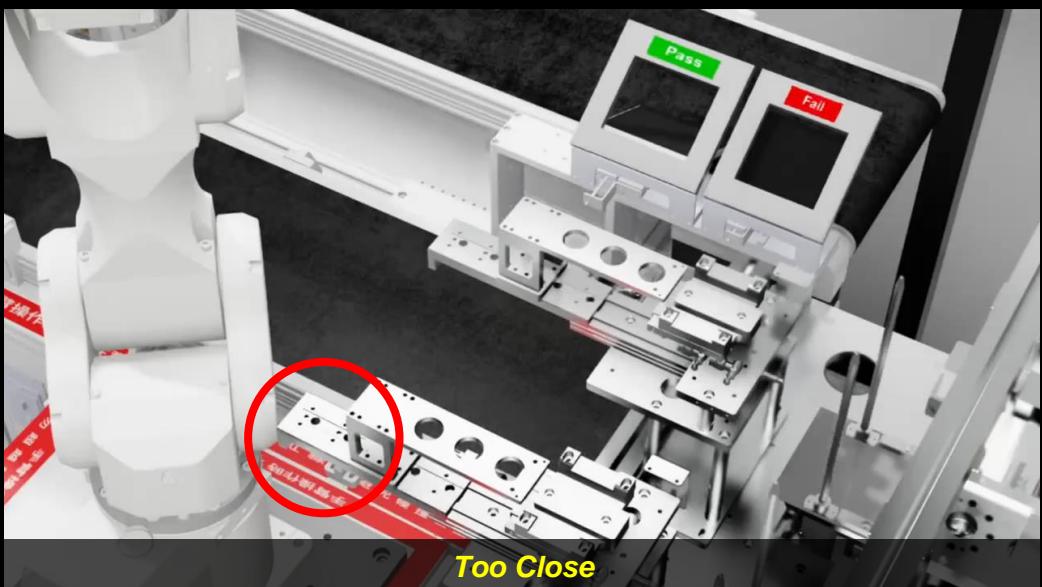
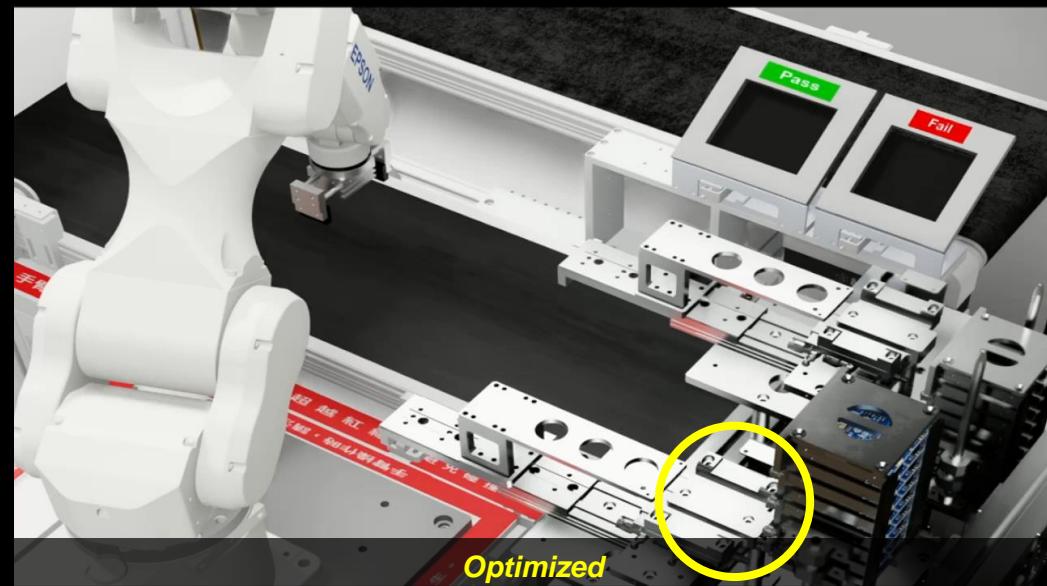


Redundant Design



Implementation

Planning, Designing , and Optimizing before Construction





Software Defined Virtual Factory

Human Centric, Data Driven, Intelligence Everywhere

Simulation & Optimization Before Implementation



PEGAVERSE Unveils a Platform for Remote Monitoring and Operation Fostering Effective Global Management





Realtime Synchronization

Past



Replay

Recreating prior machine or device actions and procedures from the past.

Present



Synchronization

Synchronize operations between virtual and real-world machines to achieve remote control.

Future

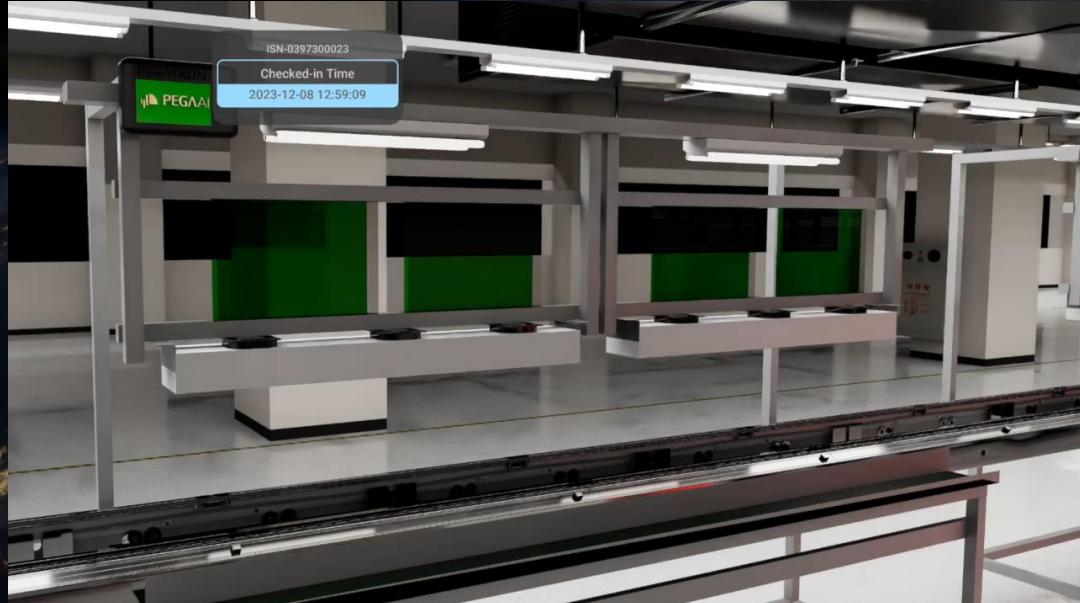


Simulation

Simulate machine operations in advance to confirm compliance with requirements.

PEGATRON[®]iOT

SMT & DIP Digital / Physical Realtime Synchronized through PEGATRON iOT Platform



Digital / Cyber Space



Physical Space

Maximize Uptime, Minimize Waste

Maximizing Productivity through Enhanced Utilization



Cyber Space



Physical Space

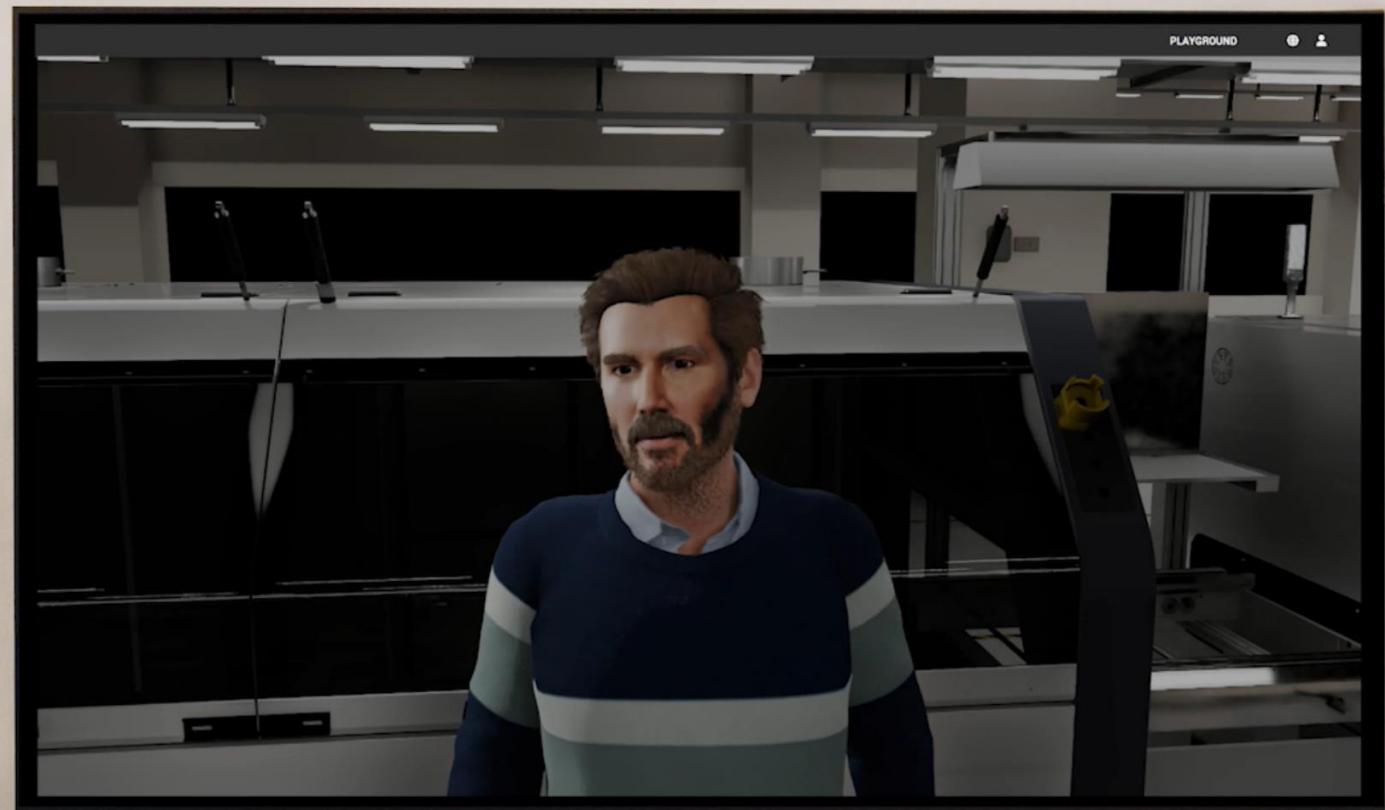
PEGAVERSE

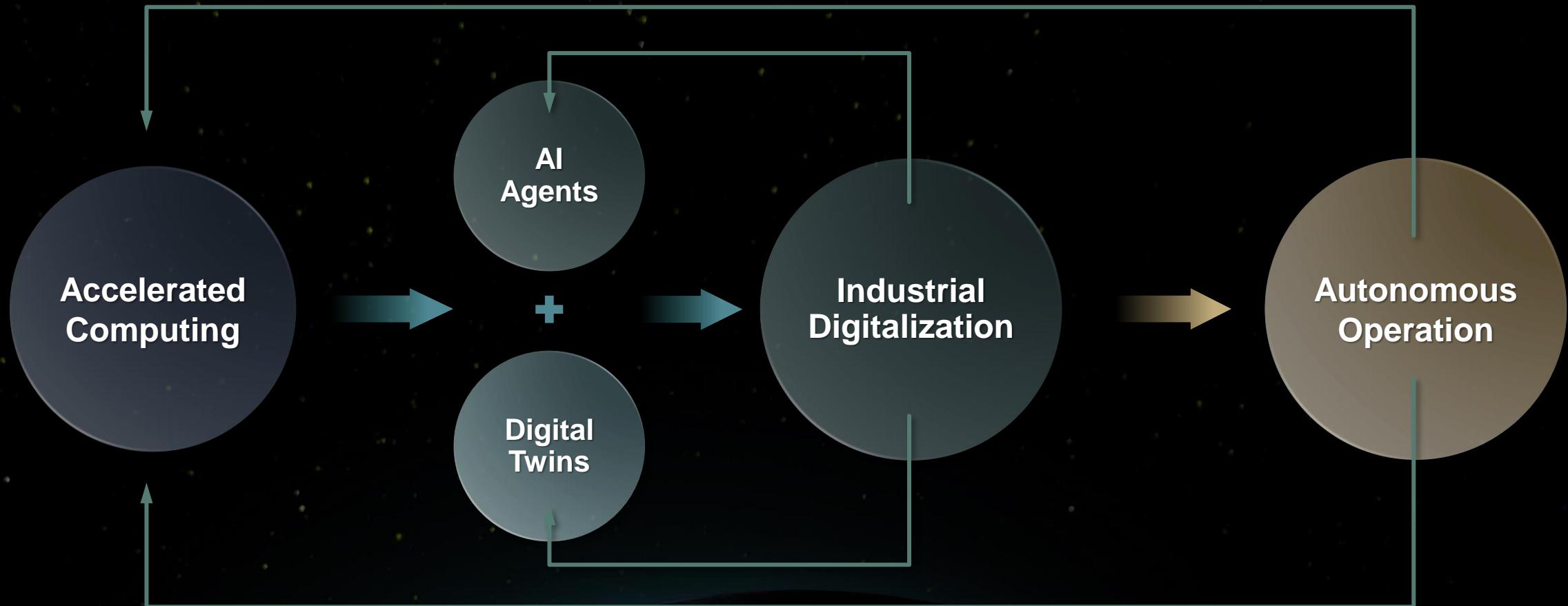
Realtime Synchronization

PEGATRON[®] IOT

Equipment Breakdown Recovery Process – **Diagnose By RAG Assistant**









Q & A

Accelerated Computing is Accelerating Industrial Digitalization.

Human Centered, Data Driven, Intelligence Everywhere

Thank You

Human Centered, Data Driven, Intelligence Everywhere

