

The Trends and Development of Smart Manufacturing in the Era of Generative AI

The Future is Here: The Unstoppable Wave of Smart Manufacturing

AI's Rising Influence in Manufacturing

Artificial Intelligence (AI) has become a focal point globally, with its robust integration into smart factories and the rapid adoption of Generative AI in daily life. The manufacturing industry is facing unprecedented opportunities and challenges as AI transforms production methods and supply chain management. AI enhances production efficiency, quality control, and introduces more flexible factory management and process innovations. From AI robotics to automated production lines, smart inspection, and supply chain management, AI is pivotal in achieving a smart manufacturing transformation. The smart factory stands as the epitome of these technologies, leading the industry towards a more intelligent, efficient, and flexible future.

Leveraging AI for Industrial Upgrades

The rapid development of AI, including Discriminative and Generative AI, promises significant improvements in production efficiency and factory operations through effective implementation and integration. The combination of IPC edge computing platforms and AI software is crucial for realizing smart manufacturing solutions amidst increasing AI computational workloads.

EverFocus, a leader in imaging integration, in-vehicle technology, and industrial computers, actively explores and applies various AI technologies. They collaborate with software partners across different fields to launch solutions tailored for various vertical markets.

In a strategic partnership, EverFocus (hardware) and Solomon (software) combine their expertise to offer superior solutions for smart manufacturing and smart factories. They utilize EverFocus's edge AI computers, powered by the latest NVIDIA processors, paired with Solomon's AI training models, delivering high-performance computing and rapidly deployable training models to meet the needs of IoT edge

devices. This collaboration aims to enhance operational efficiency and innovative services for enterprise clients.

Factory Safety and Digital Intelligent Management

To optimize solutions for smart factories, EverFocus and Solomon have implemented a factory safety and digital intelligent management platform at EverFocus's new assembly plant in Xindian District, New Taipei City, focusing on common smart factory applications.

The hardware utilizes EverFocus's embedded edge AI computers centered on NVIDIA Jetson Orin NX and Jetson Orin Nano. These computers are designed for applications such as personnel management and material inspection, leveraging EverFocus's imaging technology combined with Solomon's AI training models. This comprehensive solution features "image labeling" and "AI training" capabilities. For factory monitoring, advanced AI visual recognition can identify specific conditions in the work environment, enhancing operational efficiency.

Practical Applications of Discriminative AI

1. Smart Garment and Helmet Recognition

Ensuring employee safety and production standards is crucial in factory management nowadays. EverFocus's solution automatically identifies and manages employee attire, verifying proper protective gear usage and compliance with regulations. The system records and analyzes data, aiding operational management and employee training. Machine vision identifies issues and provides intuitive responses, showcasing AI's problem detection and immediate reaction capabilities.

The AI can quickly determine if uniforms meet dress code guidelines, identify the placement of hats or sleeves, and verify uniform colors. Only when data matches can employees access specific areas, enhancing safety and efficiency.



2. Access Control Recognition

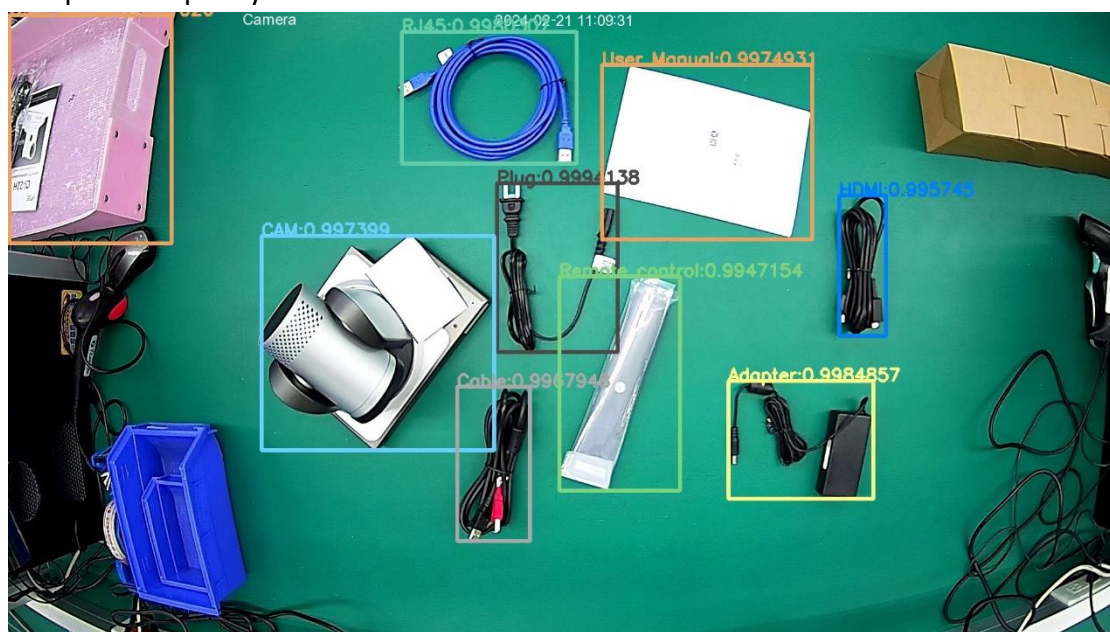
This system integrates facial recognition with access control for secure personnel management. Advanced image processing ensures precise access control, preventing unauthorized entry and streamlining management processes.

3. Finished Product Packaging Recognition

This system uses high-precision image recognition to check packaging quality and label accuracy, detecting minute defects to ensure quality standards. Data is recorded and analyzed to improve production processes.

4. Smart Production Line Recognition

This solution optimizes production processes using automated and AI analysis tools. Solomon's Smart AI Annotation System accelerates training and annotation, allowing quick identification of new objects. Real-time data adjustments optimize efficiency and product quality.



Hardware Integration

Effective smart factory solutions require various devices for information management, including:

1. IP CAM: Widely used for monitoring, leveraging EverFocus's 30 years of experience in surveillance.
2. Handheld Devices: Convenient and flexible for enterprise use without additional equipment.
3. AR Glasses: Allow hands-free operation while viewing and performing tasks.

Emerging Applications and Opportunities with Generative AI

In smart factories, Generative AI offers numerous benefits, including:

Smarter Collaborative Robots: These robots, developed with AI, can work alongside humans on complex tasks.

Immersive Spaces in Digital Twin: Digital Twins, recognized as a top technology trend, provide high-precision simulations for process optimization and real-time collaboration.

Defect Sample Generation: Generative AI can create defect samples for enhanced quality inspection and AI model training.

Creating Value through Collaboration and Integration

Since its founding in 1995, EverFocus has accumulated extensive experience in imaging processing, R&D, system integration, and global marketing. Understanding user needs deeply, EverFocus offers top-quality products and services in security surveillance, in-vehicle applications, and smart manufacturing.

In vehicle applications, EverFocus's edge AI computers are designed for harsh environments, with features like wide temperature and voltage ranges, and ignition control for stability. These computers are ideal for commercial and industrial vehicles, meeting different requirements of diverse fields

Through this article, readers gain insights into the limitless possibilities of smart manufacturing. EverFocus continues to innovate, leveraging imaging processing, edge AI industrial computers, and smart manufacturing solutions. Collaborating across fields, provides excellent systems and services, supporting global manufacturing in digital transformation and upgrades, envisioning an intelligent (automated) industrial future.

