

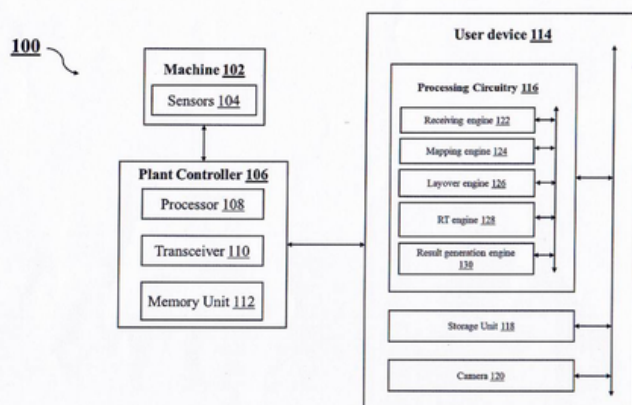
System And Method For Real-Time Twin Simulation

Seeking parties interested in licensing and commercialization of technology.

Technology Brief

This technology provides a system and method for real-time digital twin simulation of industrial machinery using mixed reality (AR/VR). Operational signals captured from machine sensors (such as temperature, pressure, vibration, and IMU data) are processed by a plant controller and transmitted to a user device, where processing circuitry maps the real-time data onto pre-stored 3D volumetric images or models (such as NeRF, point cloud, or voxel rendering). Utilizing spatial tracking and depth sensing technologies—including LiDAR, SLAM, and structured light projection—the system dynamically aligns and synchronizes the digital twin simulation directly with physical machine geometry. The solution integrates real-time physics-based modeling (CFD, FEA, MBD) alongside machine learning algorithms to superimpose color-coded performance metrics, anomaly highlights, and predictive maintenance insights directly onto the physical asset.

Block Diagram



Technical Applications

This technology is primarily applied in industrial plant maintenance, smart manufacturing, and remote infrastructure monitoring. It is well-suited for heavy machinery diagnostics, power generation plant management, automated assembly line supervision, aerospace and automotive testbeds, and hazardous industrial environment inspection where technicians can perform contact-free, real-time spatial diagnostics and predictive servicing.

Salient Features

- ✓ Spatial Alignment & AR/VR Mapping
- ✓ Physics-Based Simulation & Dynamic Overlay
- ✓ Predictive Diagnostics & Anomaly Detection

Glimpse of the Technology



REFERENCE NUMBER

iTNT-TECH-0183



TECHNOLOGY SECTOR

Enterprise Applications



IP STATUS

Patent Granted



APPLICATION NUMBER

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TECHNOLOGY READINESS LEVEL

TRL 6

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