


SoftServe

Powering AI-Enabled Solar Operations with Simulation-Driven Robotics

A Strategic Collaboration between **aes** maximo  **NVIDIA**

INTRODUCTION

As AI adoption accelerates, GPU-powered infrastructure is driving unprecedented energy demand. The AES Corporation partnered with SoftServe and NVIDIA to redefine how solar fields are built through intelligent robotics.

Maximo, the first AI-enabled solar fleet robot, transforms utility scale solar installation by combining autonomous field robotics with physics-accurate simulation and edge AI. Powered by NVIDIA Omniverse™, NVIDIA Isaac Sim™, NVIDIA AI Enterprise, and NVIDIA RTX 4000 GPUs, the solution leverages high-fidelity digital twins and physics-driven simulation to accelerate development, reduce hardware risk, and improve field reliability.

CHALLENGES



SCALABILITY PRESSURE:

Traditional solar construction speed unable to match GPU energy demand



AUTONOMY VALIDATION:

Required the ability to validate robotics and autonomous navigation before hardware availability.



HARDWARE RISK:

Dependence on physical prototypes increased cost, time and risk of failure.



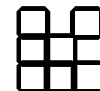
EDGE AI COMPLEXITY:

Need for real-time inferencing in outdoors environments.



DEPLOYMENT CYCLE TIME:

Product improvement and fixes require fast development, validation, and field deployment cycle.



DATA FRAGMENTATION:

Distributed image and sensor datasets across robotic fleets.

PHYSICAL AI BASED SOLUTION: ACCELERATED BY NVIDIA

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HIGH-FIDELITY DIGITAL TWIN

A physics-based, high-fidelity digital twin of Maximo robot was developed by Maximo and SoftServe to accurately replicate mobility, robotics and sensors in real solar field conditions. This capability enabled software-in-the-loop validation, rapid issue reproduction, and virtual testing of fixes before field redeployment.

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SIMULATION DEVELOPMENT

AI perception and autonomous mobility models were developed and validated in Isaac Sim simulation before hardware availability. Complex edge scenarios were tested virtually, reducing hardware dependency and accelerating deployment by 2–3 months.



KEY OUTCOMES & IMPACT



ACCELERATED DEVELOPMENT:

Reduced timeline by **2–3 months** through parallel simulation and AI validation.



RAPID VALIDATION:

Achieved **<24-hour** turnaround for issue reproduction and scenario validation.



LOWER HARDWARE RISK:

Validated **high-risk scenarios** virtually, minimizing hardware exposure

HARDWARE

- **NVIDIA RTX 4000 GPU:** Edge AI and simulation acceleration
- **NVIDIA L40S RTX GPU:** Data center AI and large-scale simulation



SOFTWARE

- **NVIDIA Omniverse™:** Digital twin creation and simulation
- **NVIDIA Isaac Sim™:** Physics-accurate simulation
- **NVIDIA Isaac ROS:** GPU-accelerated ROS integration
- **NVIDIA CUDA@:** Parallel AI computing
- **NVIDIA DCGM:** GPU monitoring and management
- **NVIDIA Optimized PyTorch:** AI model training and inference
- **NVIDIA Cosmos™:** Synthetic data generation
- **NVIDIA Container Toolkit:** GPU-enabled container runtime
- **NVIDIA AI ENTERPRISE AMI:** Production AI deployment platform



Simulation became a foundational enabler for Maximo's production readiness. By reproducing complex issues in a virtual field environment, we are able to perform RCA and validate fixes within hours, significantly reducing hardware risk and accelerating deployment timelines.

Nicolas Riehl
Head of Product, Maximo



By integrating physics-based simulation into the core development lifecycle, Maximo and SoftServe demonstrated how AI-enabled robotics can scale renewable infrastructure faster, safer, and with greater confidence.

Lyubomyr Demkiv
Director, Robotics & Advanced Automation, SoftServe

SOFTSERVE COLLABORATING WITH NVIDIA

SoftServe brings Physical and Agentic AI to life by leveraging the full breadth of NVIDIA's technology stack, enabling enterprises to move beyond AI experimentation and into production with scalable, outcome-driven solutions. As NVIDIA's 2025 Service Delivery Partner of the Year and an Advanced Technology Partner, SoftServe delivers real-world impact through high-fidelity simulation, robotics and automation, intelligent collaborative agents, and computer vision at scale.

Reach us out to learn more!



MEET MAXIMO



PHYSICAL AI