
AI Robot Solution
Accelerating Robotic Innovation with
Industrial-Grade Platforms, Machine Vision, and Sensor Fusion
Vecow

Powering the Future of AI Robotics

The Integrated Platform for Building and Scaling Market-Ready Robots

The Vecow End-to-End AI Robot Solution delivers AI-accelerated Platforms, Time Synchronization, Software Stack, and Fleet Management. From concept to fleet, Vecow one-stop AI Robot Solution simplifies your development process, accelerating value creation and securing market leadership.

Robotic Function

- Locomotion Modules
- Navigation Modules
- Perception Modules
- Manipulation Modules
- Human-Robot Interaction

Software Stack

- Robotic OS
- Perception & Navigation
- Manipulation
- Digital Twin & Simulation

Middleware & Communication

Time Sync

EtherCAT Technology Group · 1000BASE-T1 · GMSL · CAN Isolated

Communication Protocol

Sensor, Robotic Hardware & Actuation

Camera

LiDAR

Radar

IMU

Arm

Edge Computing Platform

X86 Platform

NVIDIA® Jetson™

Qualcomm

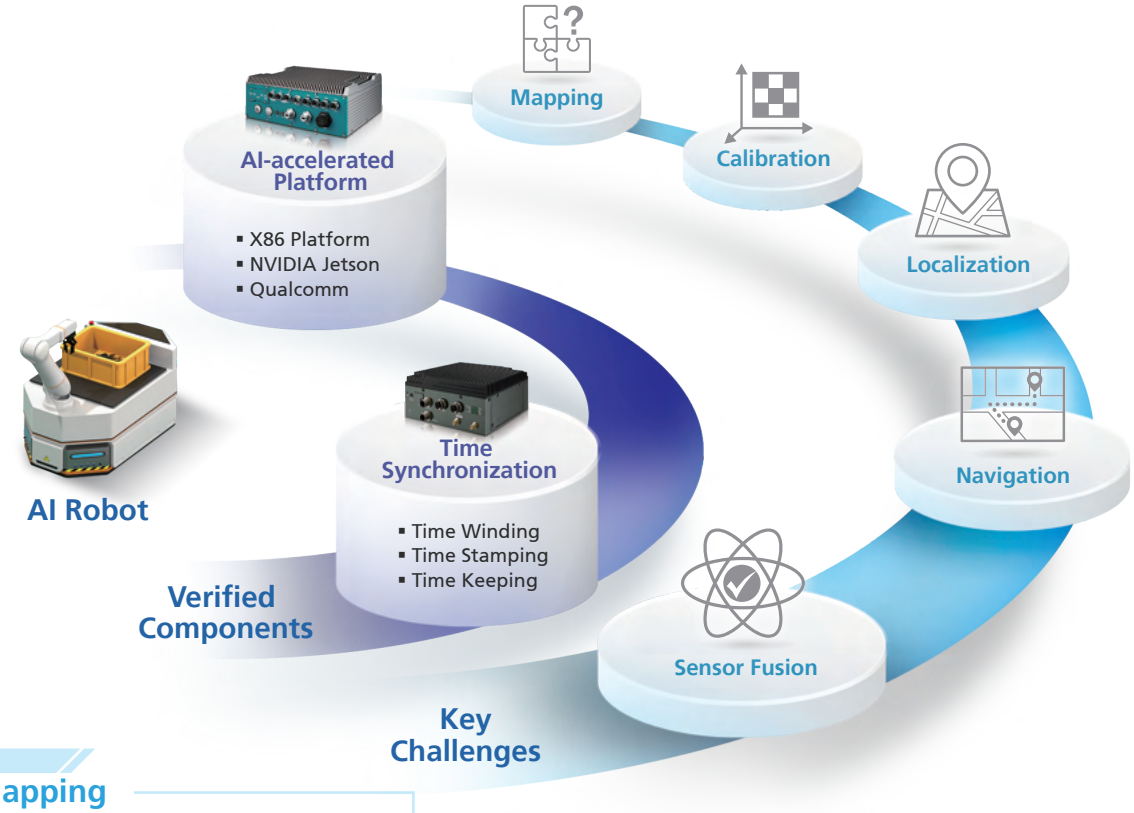
Orchestrating Robotic Success

An End-to-End Delivery Platform, Ecosystem-Powered for Accelerated Time-to-Robot

- ✓ End-to-End Project Delivery
- ✓ Leading Ecosystem-Powered Platform
- ✓ Accelerated Time-to-Market

Key Challenges for Autonomous Robotics

For an autonomous robot to operate effectively and safely, it must overcome several fundamental challenges. Each requires sophisticated software and hardware integration to master.



Mapping

Building and updating the detailed digital maps that robots rely on to see their world.

Calibration

Aligning multiple sensors to work in perfect harmony, eliminating data conflicts.

Localization

Knowing the robot's exact location and orientation at all times, without fail.

Navigation

Planning the smartest, safest, and most efficient route while actively avoiding obstacles.

Sensor Fusion

Combining inputs from all sensors to create a single, comprehensive understanding of the environment.

Time Synchronization Technology

Crucial Mission of Sensor Fusion

Synchronizing data from LiDAR, cameras, IMUs, GNSS, and radar is essential for reliable perception and precise decision-making in autonomous robotics. Vecow's Time Synchronization Technology ensures next-level accuracy in multi-sensor fusion, powering Zero-error Perception, Nano-second Precision, and Centimeter Position robotic systems.

VTS-1000 Series Time Sync Box

VTS-1200GU/1200/1100

Xillinx Zynq® UltraScale+™ MPSoC, 1 Sync In, 8 Sync Out, 1 RTCM, 1 UART, Dual GNSS GPS, 9-axis IMU

Key Technologies

Time Winding

- Align GNSS with sensor internal clocks
- Continuous PPS trigger to all nodes
- Unified time baseline for all sensors

Time Stamping

- Push precise time signals to all nodes
- Synchronize all sensors consistently
- Support global frequency standards

Time Keeping

- Preserve time pulses and sync integrity
- Calibrated Local Time
- Signal Resilience & Anti-Jamming

AI-driven Spatial Perception and Robot Navigation

Powered by Kudan Autonomous Mobile Robot Software Stack

The cutting-edge software suite empowers Autonomous Mobile Robots with full autonomy and enables cost efficient deployment, seamlessly integrating advanced AI with high-performance real-time perception and navigation.

Market Challenges

Operation & Scaling Stage

- Map Degradation and High Maintenance Cost
- Poor Performance in Edge Cases
- Limited Adaptability for Wider Use Cases and Environments

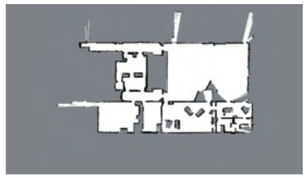
Product Development Stage

- Algorithm Selection Challenges
- Extensive Parameter Tuning
- Limited Simulation and Validation
- High R&D Costs and Long Time-to-Market

Launch & Deployment Stage

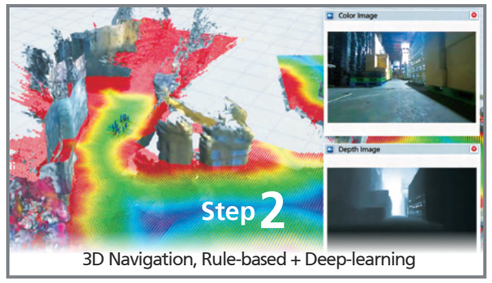
- Initial Mapping & Setup Complexity
- Site-Specific Customization
- Lack of Standards & Interoperability
- Regulatory & Safety Hurdles
- High End-user Training Effort

World-class SLAM and 3D Perception **Technology Approach**



Step 1

2D Navigation, Rule-based



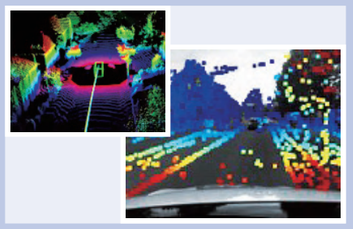
Step 2

3D Navigation, Rule-based + Deep-learning

Step 3

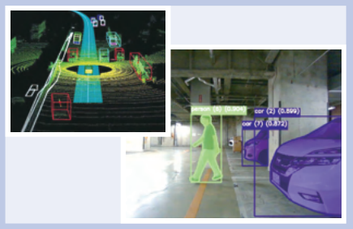
3D + Semantic Navigation, Rule-based + Deep-learning

End-to-End Navigation and Perception Solution



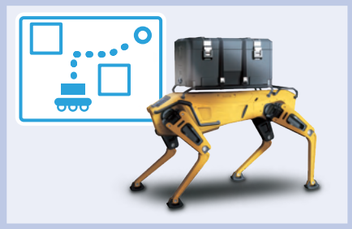
Localization

Deep learning-based multi-sensor SLAM ensures robust performance in complex, dynamic environments.



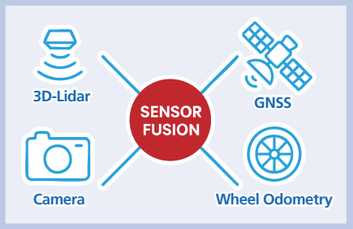
Perception & Obstacle Detection

With trained models, the system delivers accurate spatial awareness and dynamic obstacle handling.



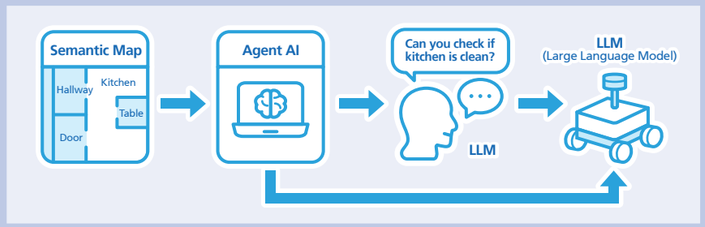
Planning & Control

Context-aware, adaptive planning across diverse robot forms, ensuring safety and efficiency.



Sensor Fusion

Advanced sensor fusion ensures reliable perception and navigation, maintaining high data integrity.



Agent AI + LLM

The Agent AI module understands user's verbal or written commands, leverages a semantic map to understand the environment, and plans context-aware actions to enable smart, adaptive navigation and meaningful interaction.

Elevating Precision Robotics

Edge Intelligence • Seamless Integration • Real-World Deployment

Solution Deliveries

- AI-accelerated Platform
- Time Synchronization
- Software Stack
- Fleet Management

Platform Capabilities

- Machine Vision Ready
- Sensor Fusion
- Real-time Inference
- Industrial-Grade Reliability

Your Strategic Edge

Streamlined Robot-to-market

Achieve superior ROI through a more efficient development cycle and simplified integration.

Competitive Value & Advantages

Accelerate your innovation with Vecow's robust and scalable Edge AI ecosystem.

Optimized Real-World Deployment

Engineered for maximum uptime, enabling simplified management of large-scale fleets.

Explore the platform trusted by robotics innovators worldwide. Partner with Vecow to bring precision, performance, and reliability to your AI Robots.

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