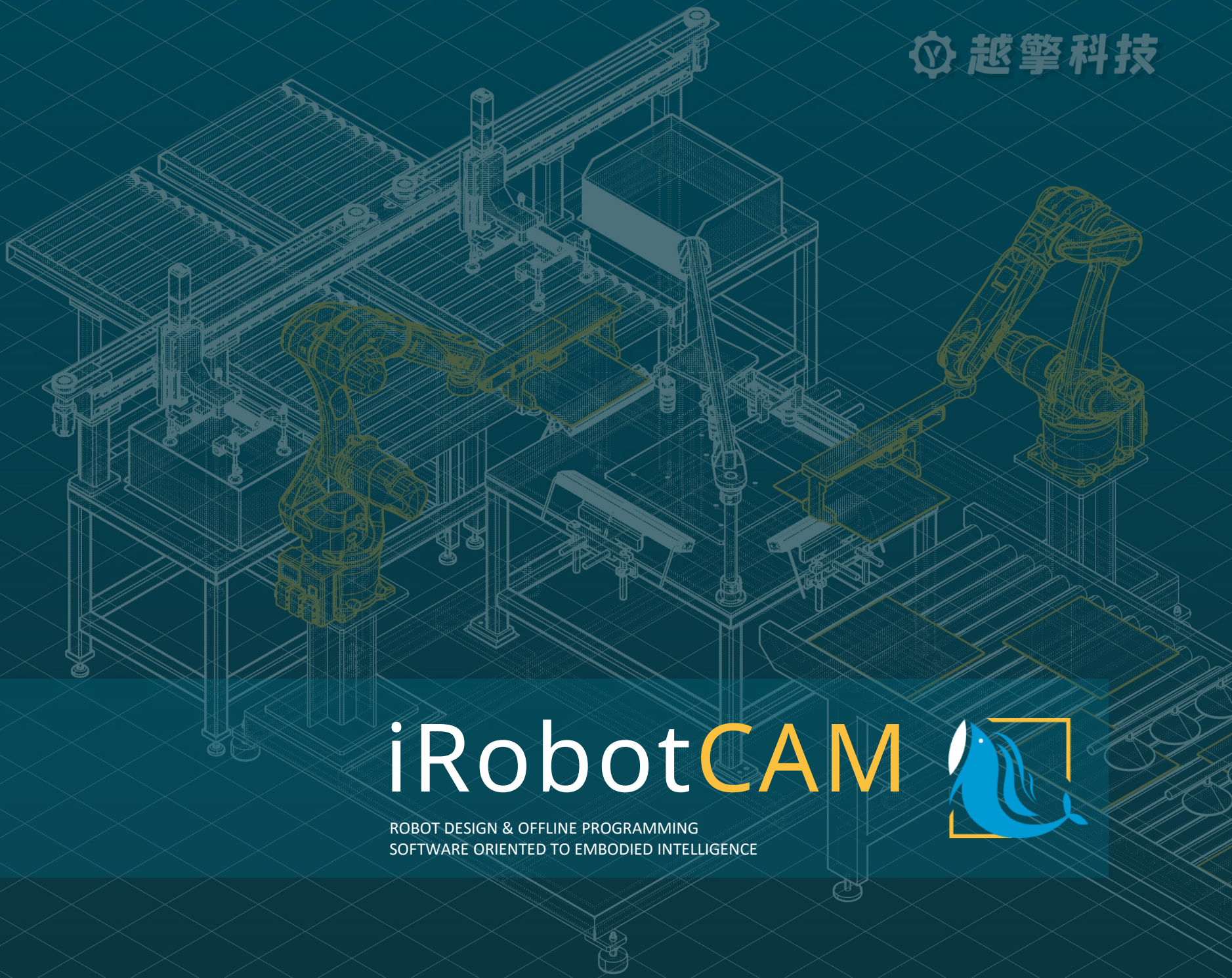
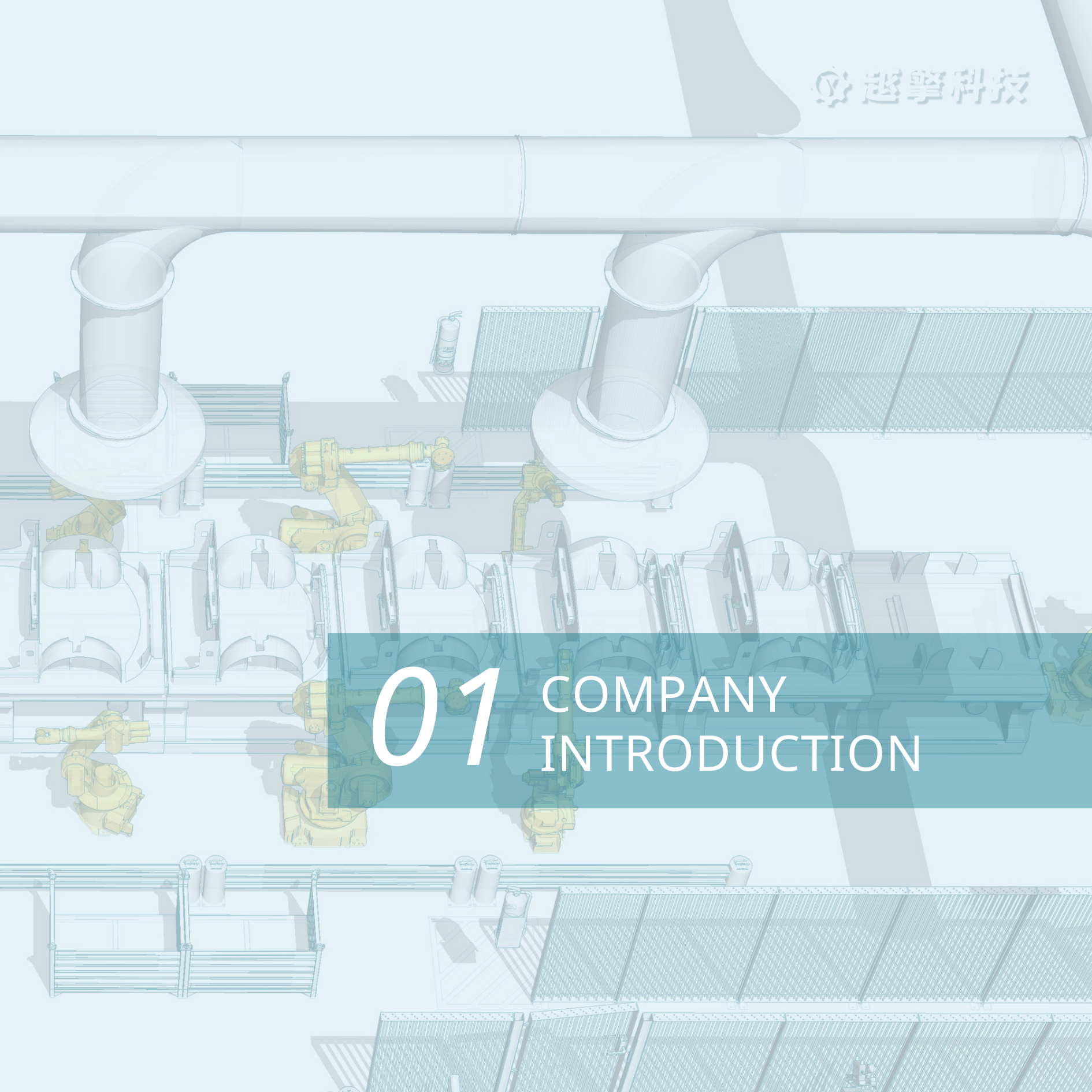
越擎科技



iRobotCAM

ROBOT DESIGN & OFFLINE PROGRAMMING
SOFTWARE ORIENTED TO EMBODIED INTELLIGENCE

Outline



01 COMPANY INTRODUCTION

Overview

Nanjing Yueqing Information Technology Co., Ltd. was established in April 2020 and is located in Nanjing, Jiangsu Province. The iRobotCAM robot design and simulation software is the company's core R&D achievement.

Leveraging the advantages of a CAD architecture based on a three-dimensional geometric kernel and using CAD data as the foundation, iRobotCAM addresses application accuracy issues in 3D modeling scenarios from a structural perspective. By creating digital scenarios for industrial robots, it can meet high-precision application scenarios such as robot welding, spraying, engraving, polishing and grinding, laser cutting, arc additive manufacturing, and carbon fiber 3D printing. For the convenience of embodied intelligence design, iRobotCAM provides fast solutions for embodied intelligence design and simulation.

Team

The company's R&D team is centered on independent innovation, focusing on industrial robot programming simulation and digital twin technology. The independently developed iRobotCAM robot offline programming and simulation software has overcome key technologies such as robot kinematics algorithms and physics engine simulation. It is compatible with hundreds of robot brands, including GSK, Inovance, Turing, ABB, and KUKA, and achieves seamless integration of native CAD data based on the ZWSOFT 3D geometric kernel, enabling micron-level programming precision. It has been applied in scenarios such as chip manufacturing, complex electromechanical product assembly, and high-precision machining.

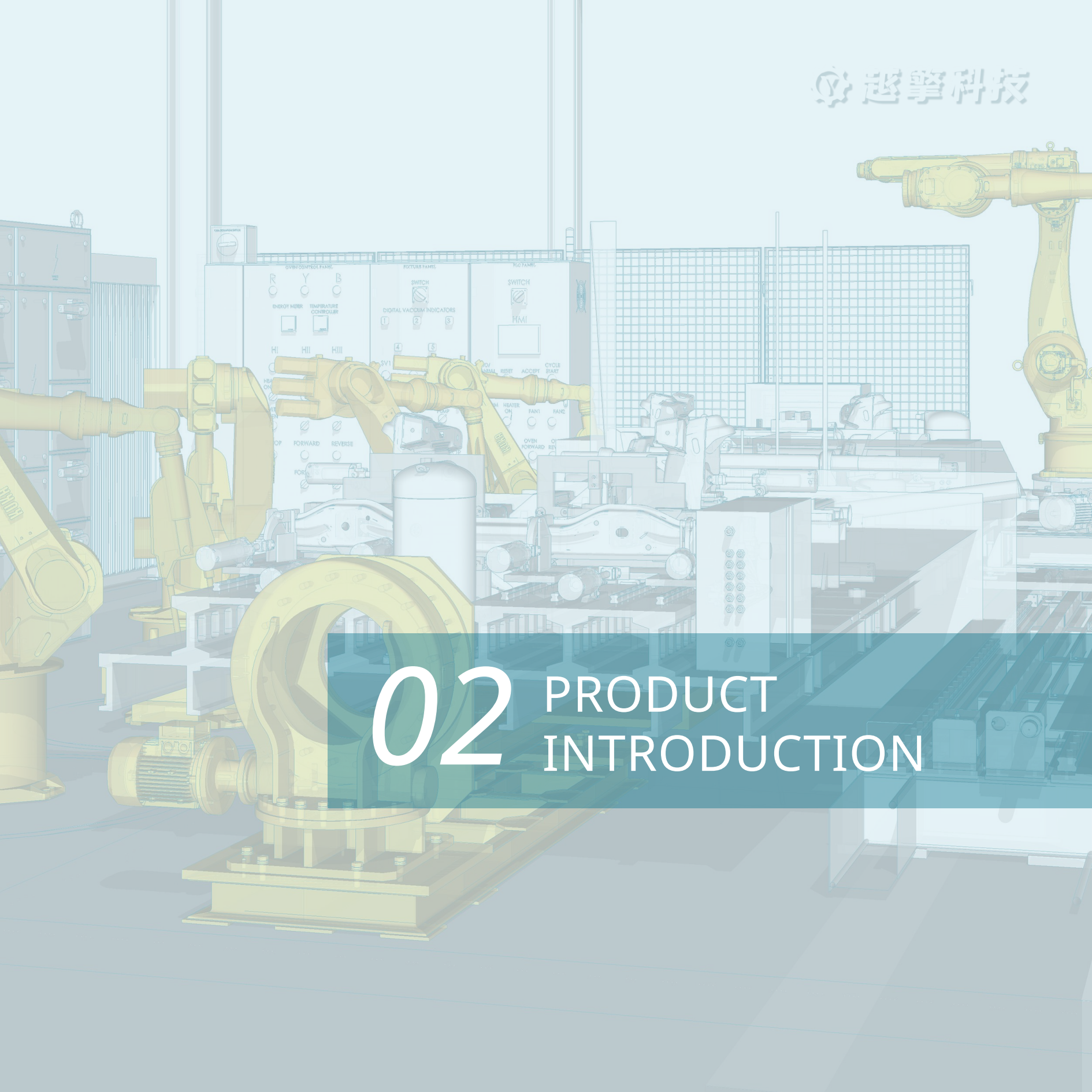
Development

2021 The development of the iRobotCAM preview version has been completed, and Yueqing Technology has reached a strategic cooperation with ZWSOFT.

2023 In April, Yueqing Technology officially released iRobotCAM V1.0 based on the CAD architecture, featuring comprehensive robotic process capabilities.

2025 A next-generation robot design and offline programming platform, supporting offline robot programming and virtual debugging, as well as embodied intelligent robot design and simulation.

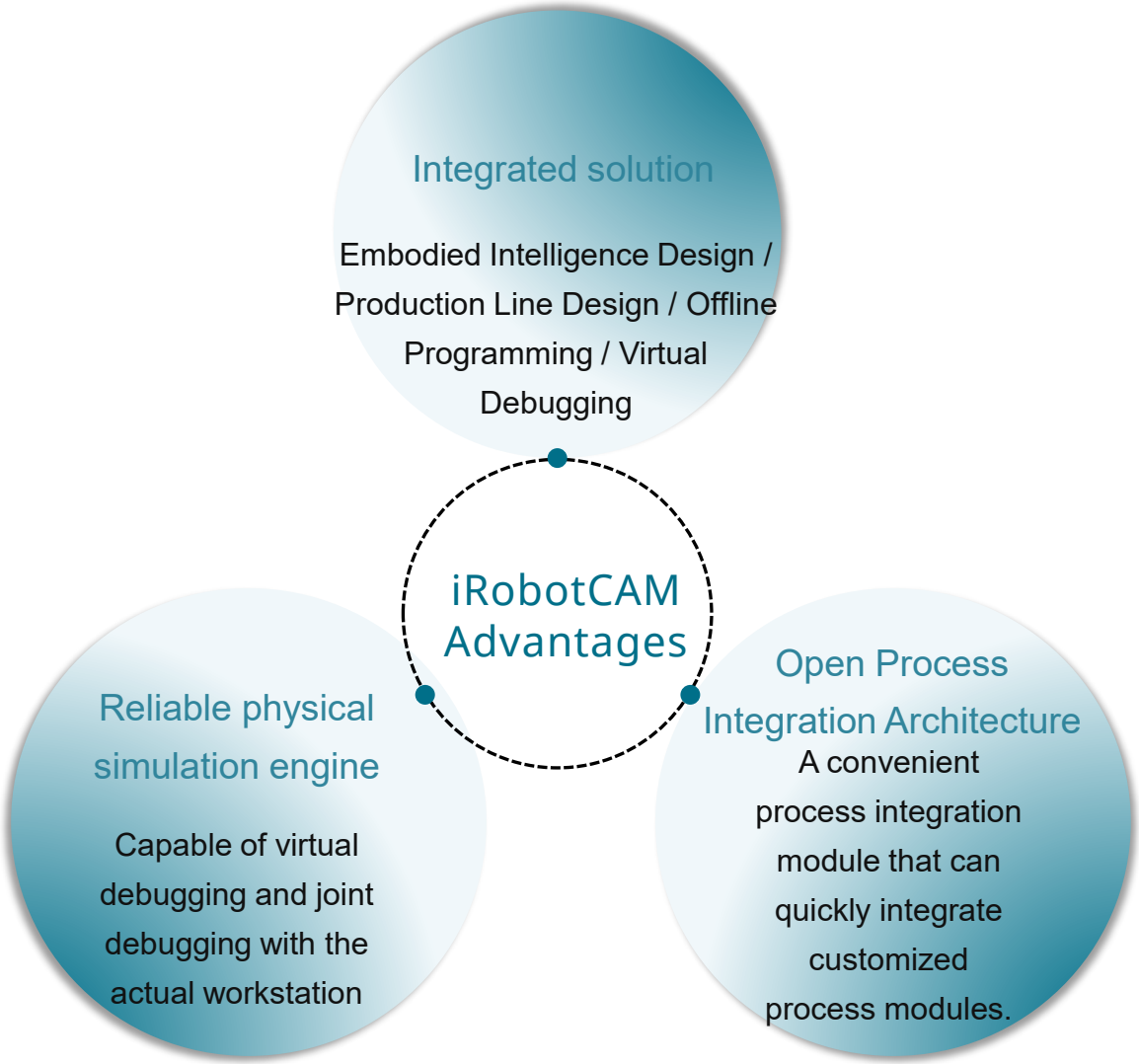
2026 iRobotCAM releases cross-platform version V2.0, significantly enhancing embodied intelligence design and offline programming efficiency.



02 PRODUCT INTRODUCTION

iRobotCAM architecture

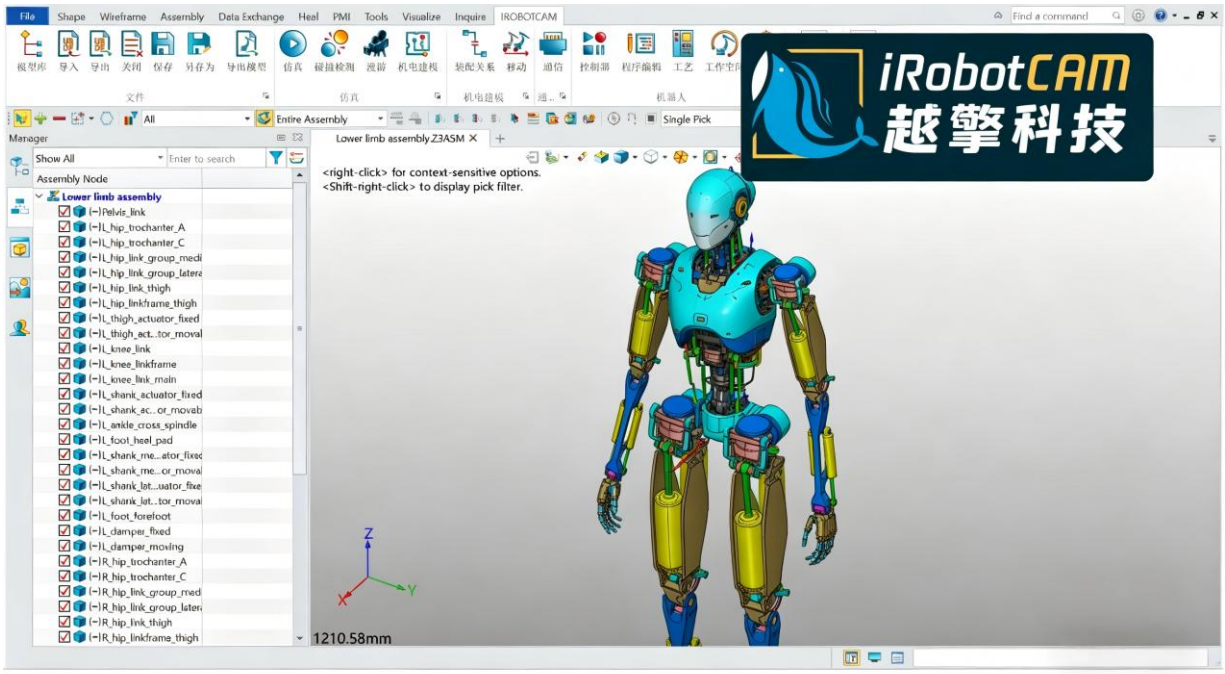
Application Level	Platform Layer	Underlying Engine
Embodied Intelligence Design and Simulation Welding Process Coating Process Product Assembly Laser Cutting Sculpting Technique Polishing Technique Virtual Debugging Additive Manufacturing	iRobotCAM Robot Design and Offline Programming Platform	3D Geometry Engine Physics Motion Engine Trajectory Generation Algorithm Robot Kinematics



iRobotCAM Product Features

Embodied Intelligent Robot Design

Provide a skeletal design framework, supporting the design of serial robots and parallel robots



Robot Design Process

iRobotCAM is based on a three-dimensional CAD architecture, supporting the import of dozens of 3D formats such as Caita, NX, Solidworks, Creo, ACIS, and STEP. It ensures the correctness of embodied intelligent design from the data source, supports URDF output and MuJoCo XML output, and interfaces with various simulation and training software such as MuJoCo and ISAAC SIM.

START

STEP 1
Import 3D Model

STEP 2
Adjust model components

STEP 3
Material and Physical Property Settings

STEP 4
Creating Rigid Bodies and Model Simplification

STEP 5
Create a coordinate system

STEP 6
Create a kinematic pair

STEP 7
Constructing a skeletal-style general-purpose robot

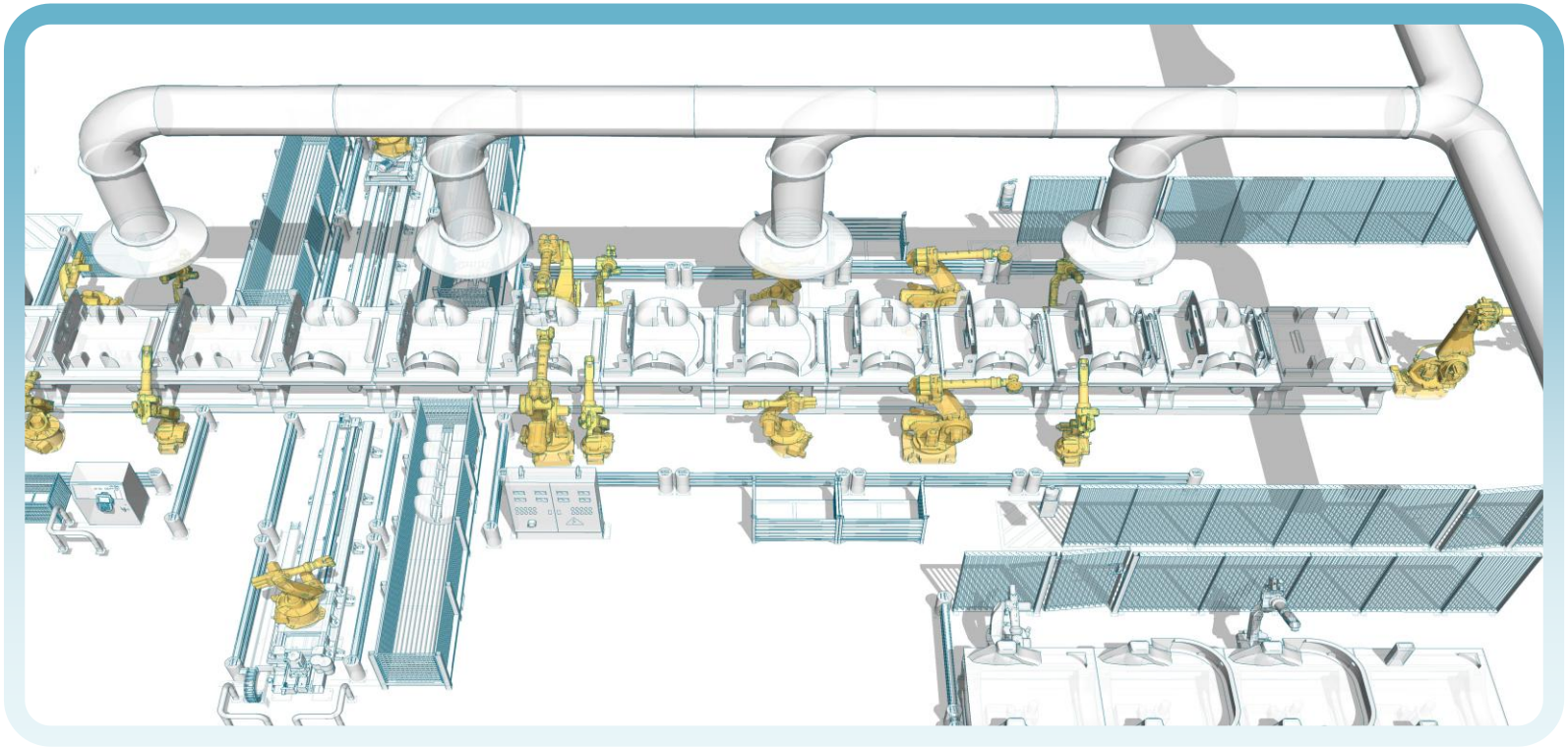
STEP 8
Export URDF and other parallel mechanism files

FINISH

iRobotCAM Product Features

Robot production line design

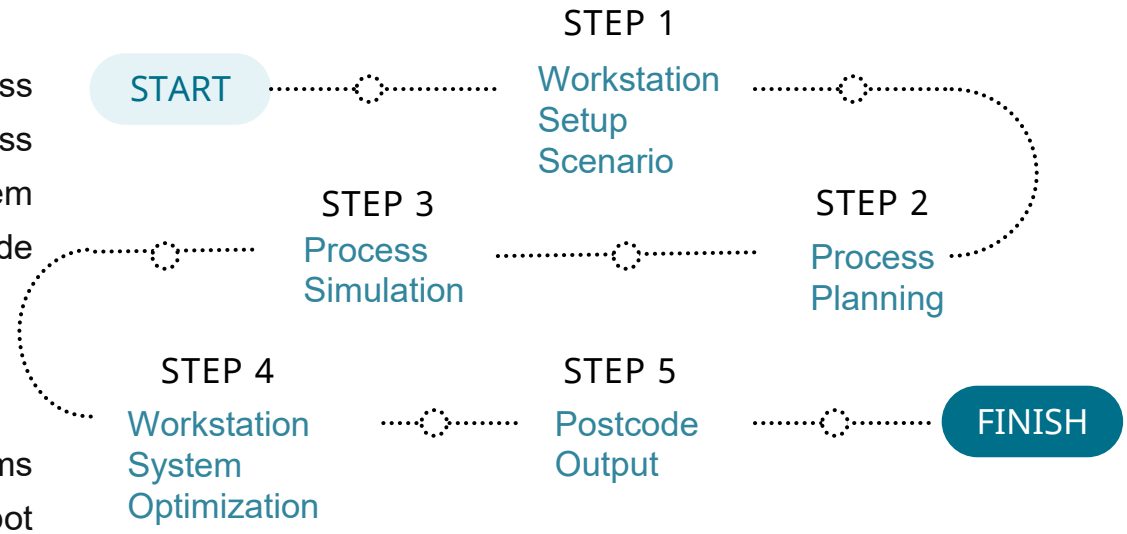
Utilize parametric design software to fulfill the design of single-robot workstations and robotic production lines



Offline Programming of Robots

Programming process:

Robot Model Import ------> Process Planning ------> Machining Process Simulation ------> Workstation System Optimization ------> Post-Processing Code Output



Programming Verification:

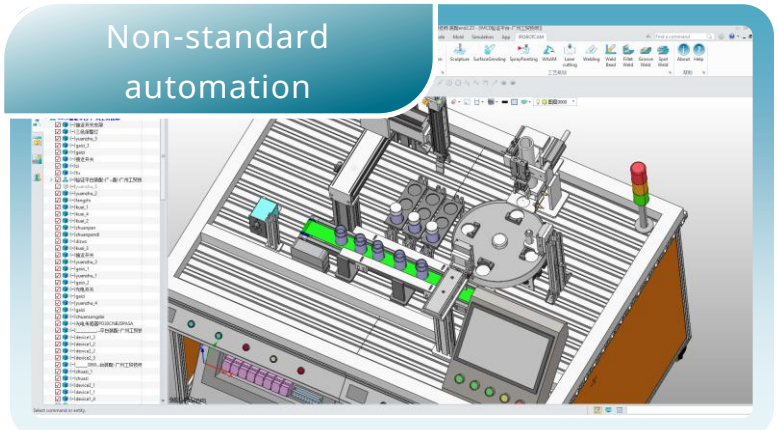
Supports decompilation of robot programs and can verify and optimize robot programs.

iRobotCAM Functions

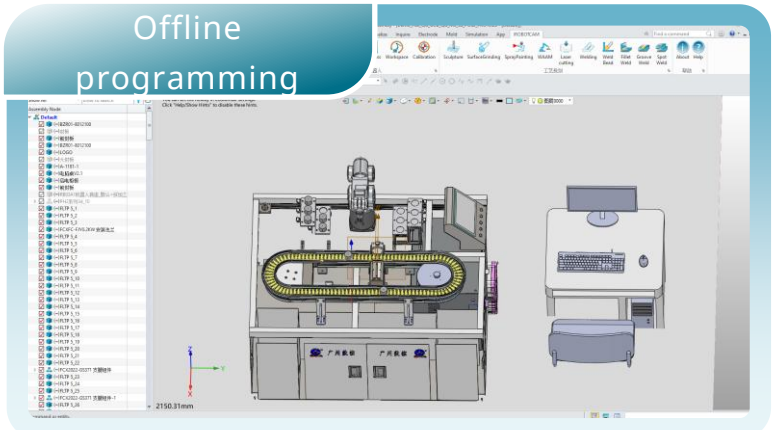
Robot offline programming

Multi-step processing

Non-standard automation



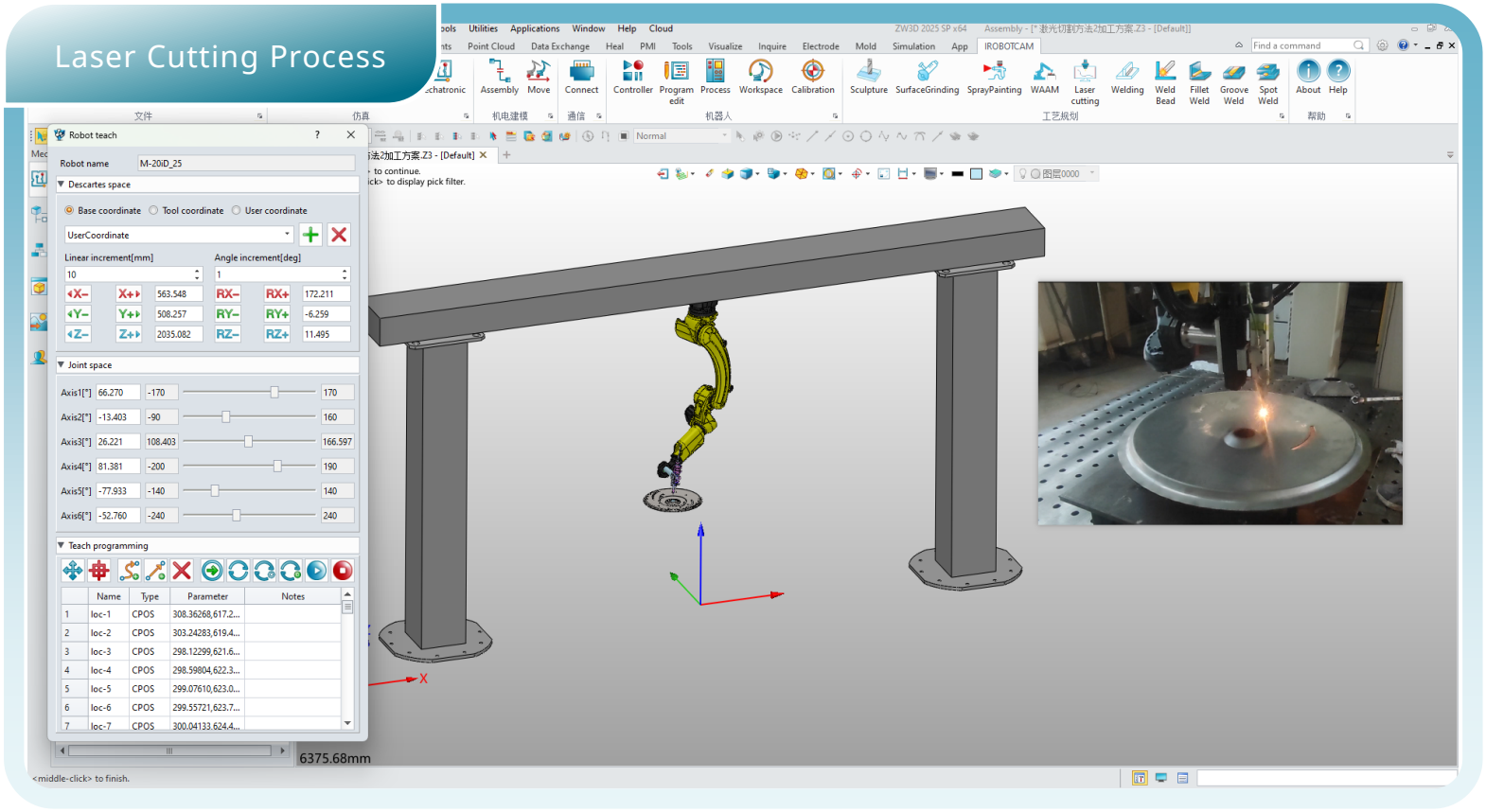
Offline programming



iRobotCAM Functions

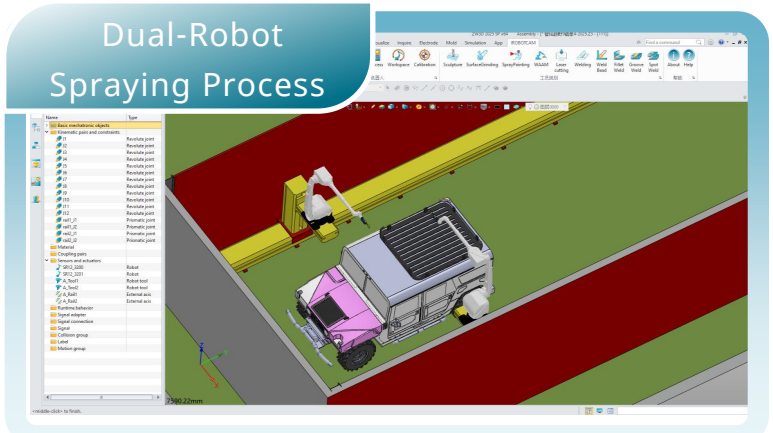
Process Module

Laser Cutting Process



Collaborative Welding Process

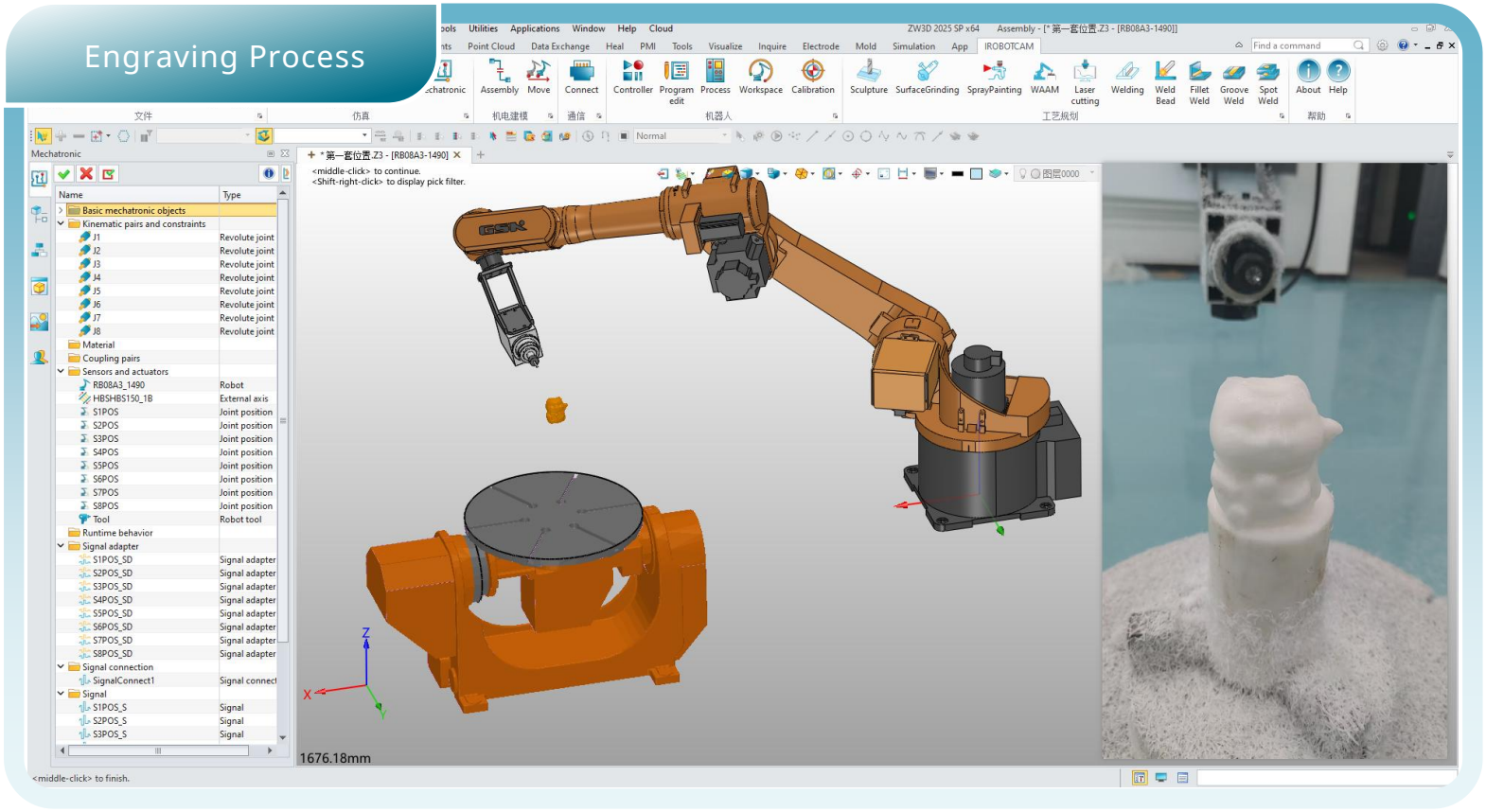
Dual-Robot Spraying Process



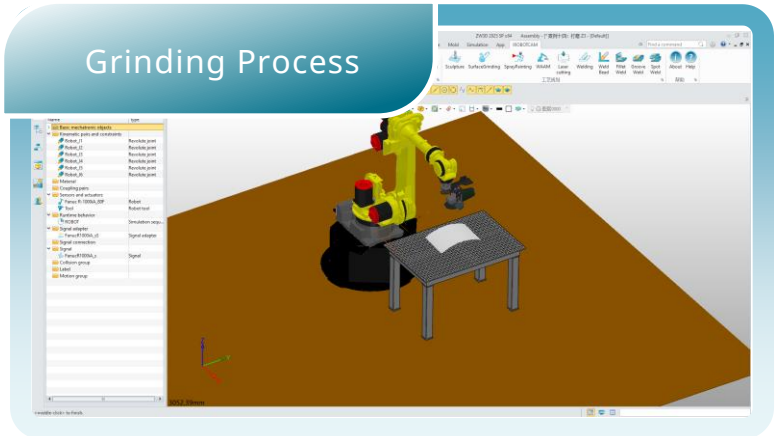
iRobotCAM Functions

Process Module

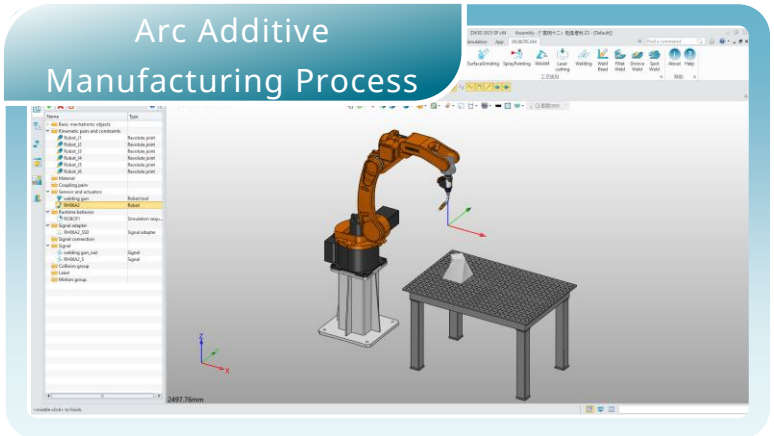
Engraving Process



Grinding Process



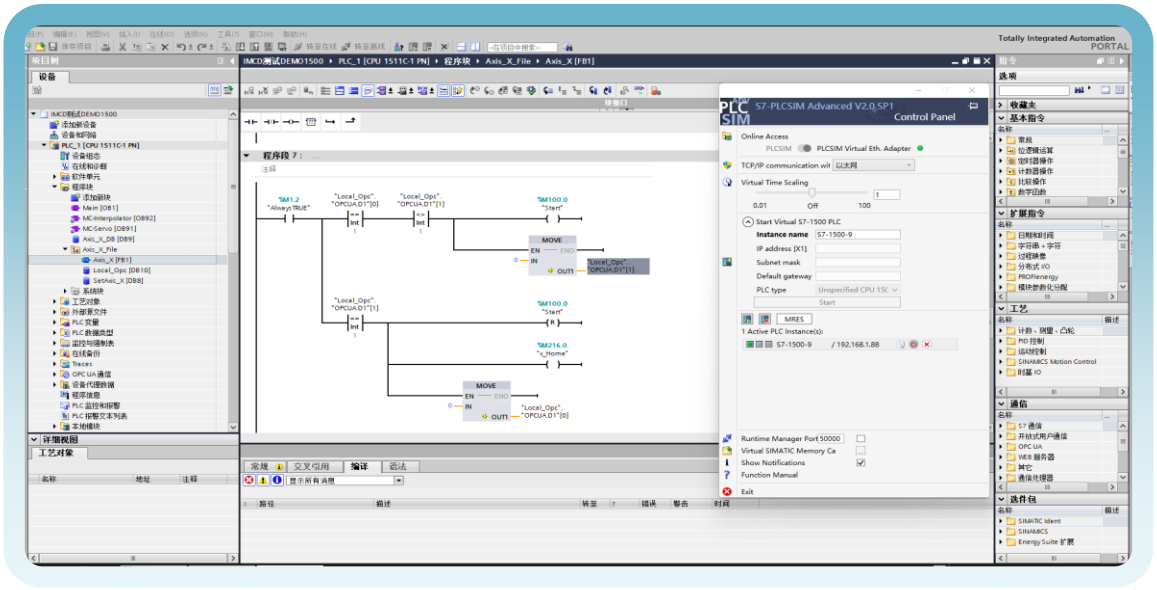
Arc Additive Manufacturing Process

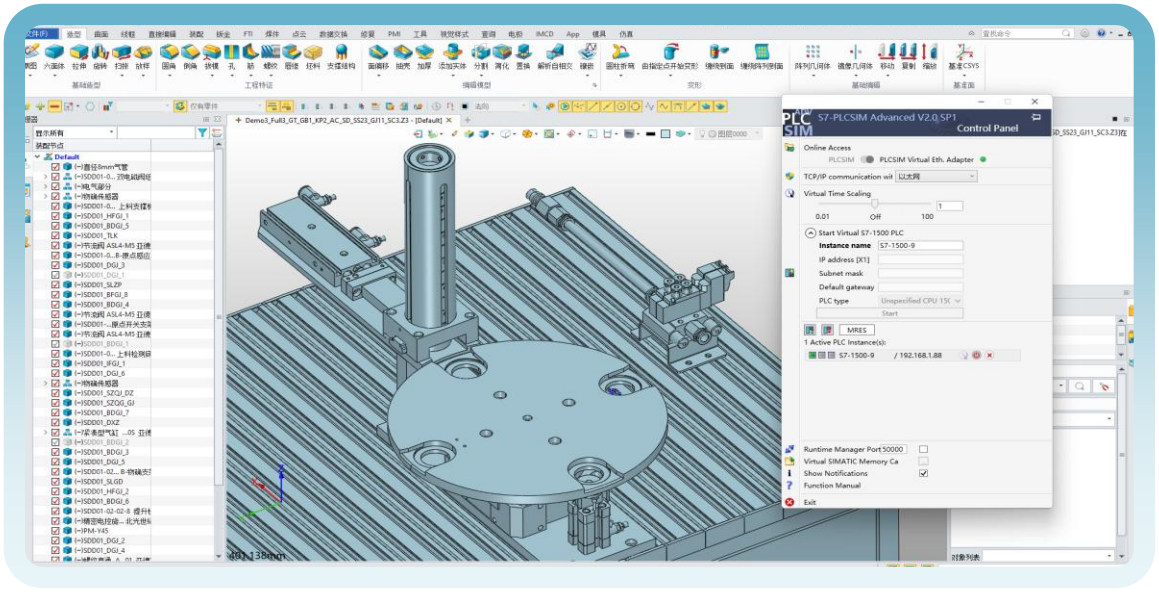


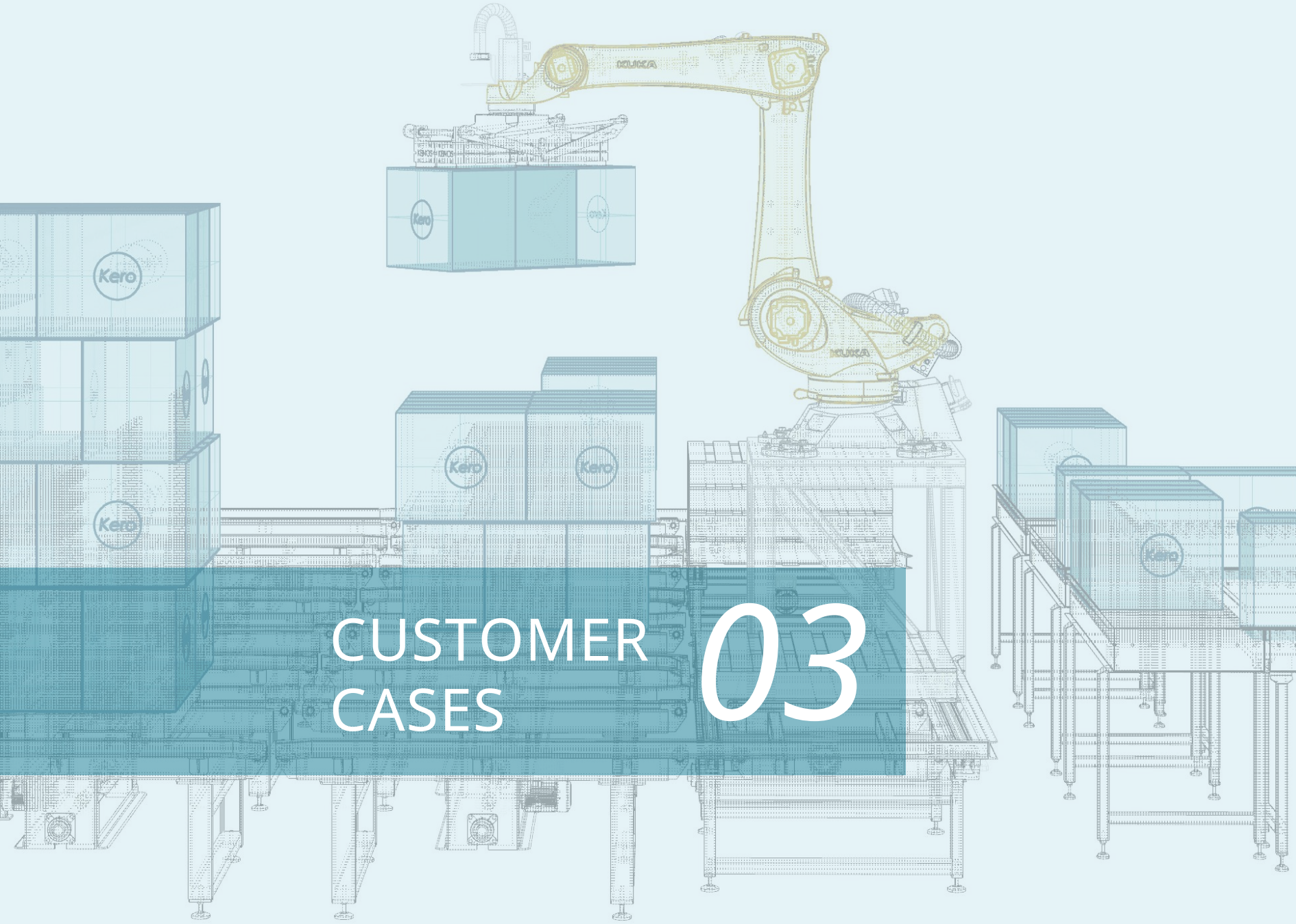
iRobotCAM Functions

Virtual commissioning

Virtual commissioning and virtual monitoring by digital-twin; supports multi-machine IO communication simulation, multi-robot synchronization, and multi-axis linkage planning of robots.



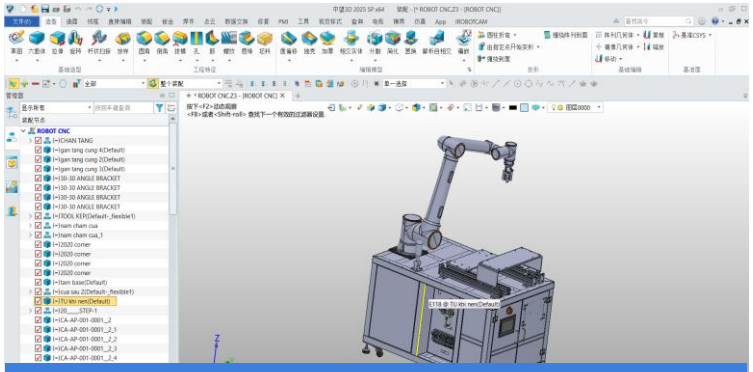




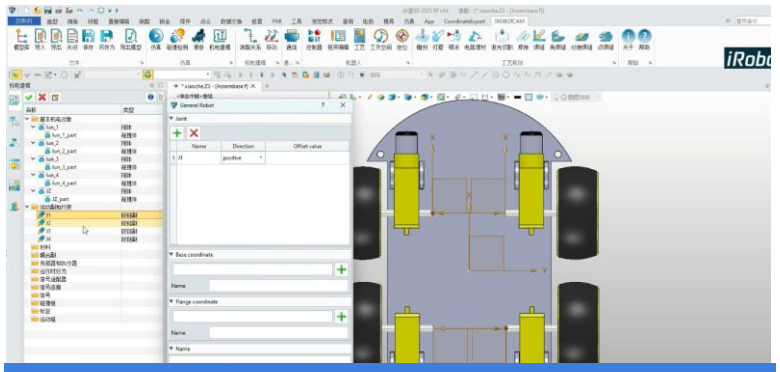
CUSTOMER CASES 03

Embodied Intelligence Design Applications

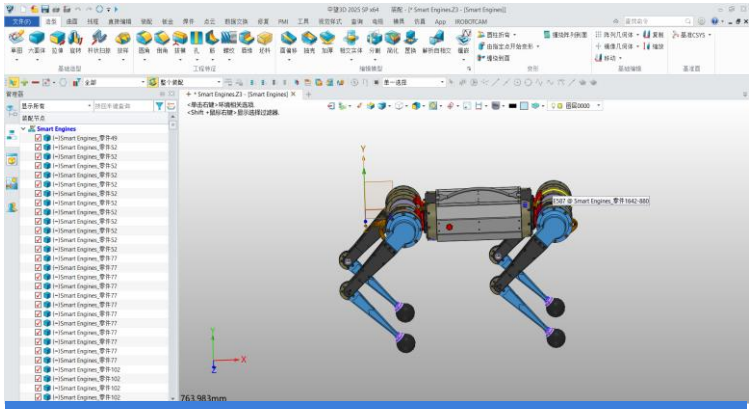
- A skeletal joint design process, connecting design to simulation, meeting the requirements of humanoid robots, quadrupedal robots, aerial robots, and other embodied intelligent agent designs.



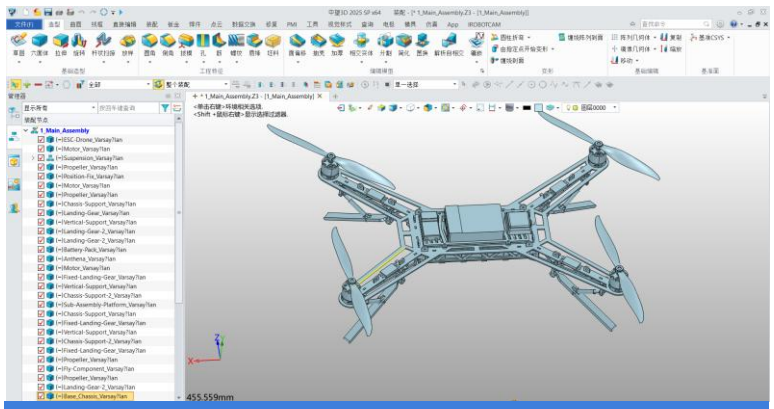
Composite Robot Design



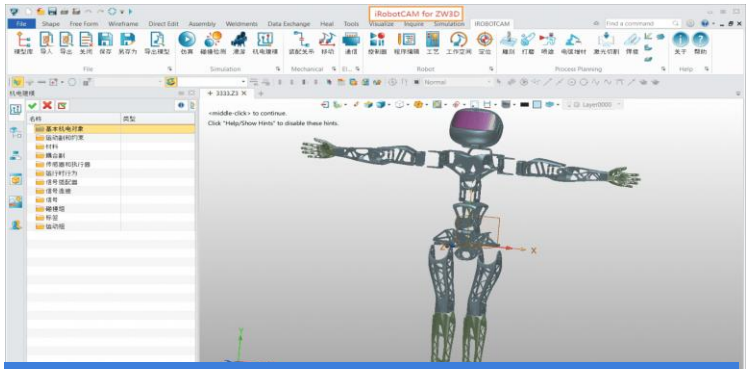
Four-Wheeled Vehicle Design



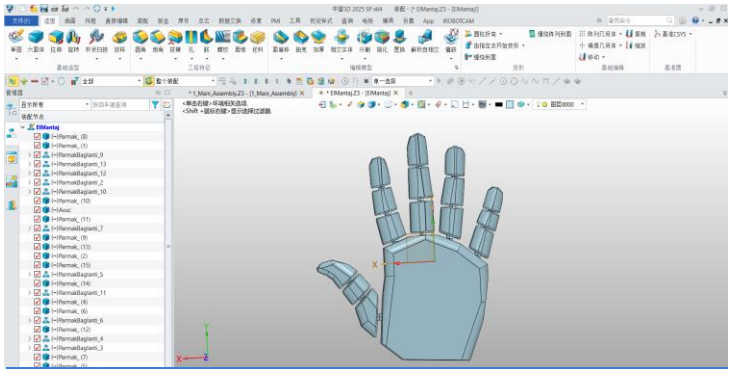
Quadruped Robot Dog Design



Drone Design



Humanoid Robot Design



Dexterous Hand Design

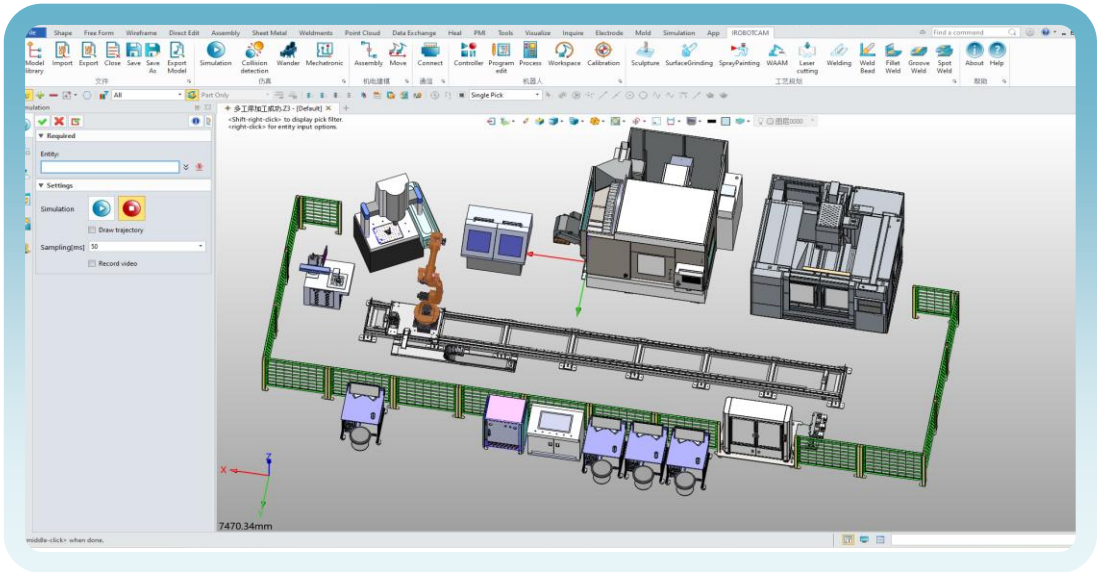
Numerical Control Equipment | GSK

Mechatronics design and Virtual commissioning platform

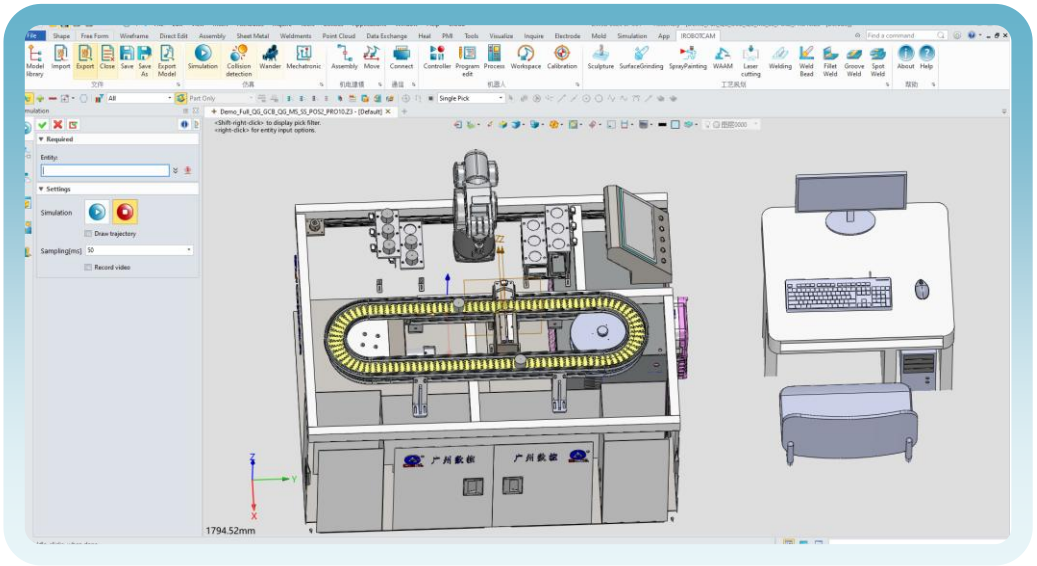
Robots, processing equipment (machining centers, injection molding machines, etc.)

Definition and control of motion mechanisms such as positioners, conveyor belts, and cylinders

Supports sensor modeling with the built-in library



Teaching



Robot interpolation algorithms, including several basic interpolation algorithms such as straight lines, arcs, joints, etc.

Achieve multiple programming mode selections for industrial robots, such as hand-held tool and hand-held workpiece modes.

Education equipment

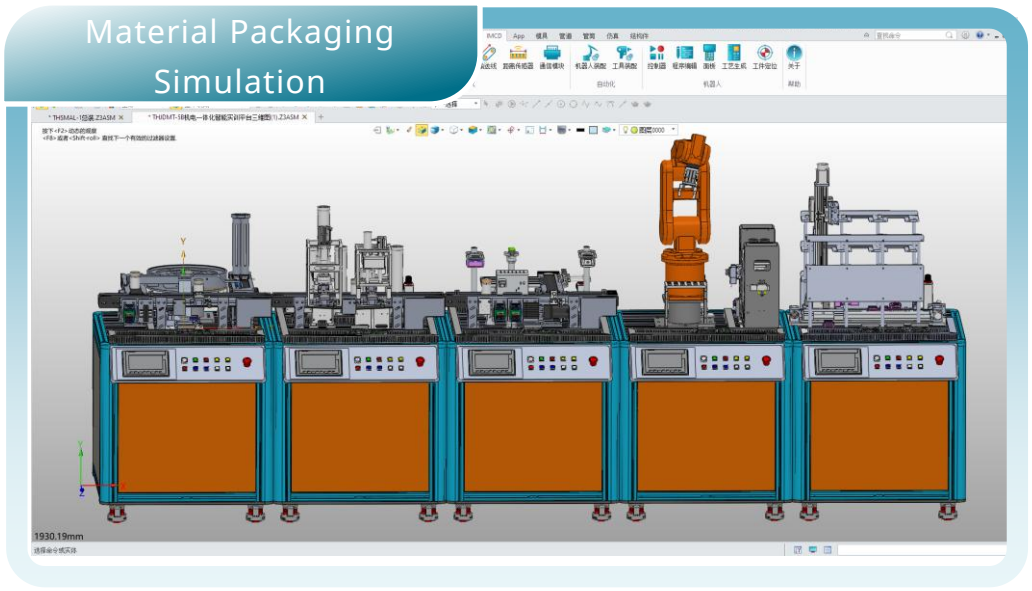
Motor assembly simulation, including robots, quick-change devices, conveyor lines, and various sensors

Digital twin simulation, collect production line data, and map motion controller data and PLC data to the simulation system

Leverages the CAD architecture based on a 3D geometric kernel to enable interconnection between the physical and virtual worlds

Motor Assembly Simulation

Material Packaging Simulation



Material packaging simulation, including vibrating plates, multiple conveyor lines, robots, motor drives, material assembly, material transportation, and material warehousing

With data collection, data mapping, materials and motion equipment information, achive digital-twin Virtual commissioning in both of hardware and software

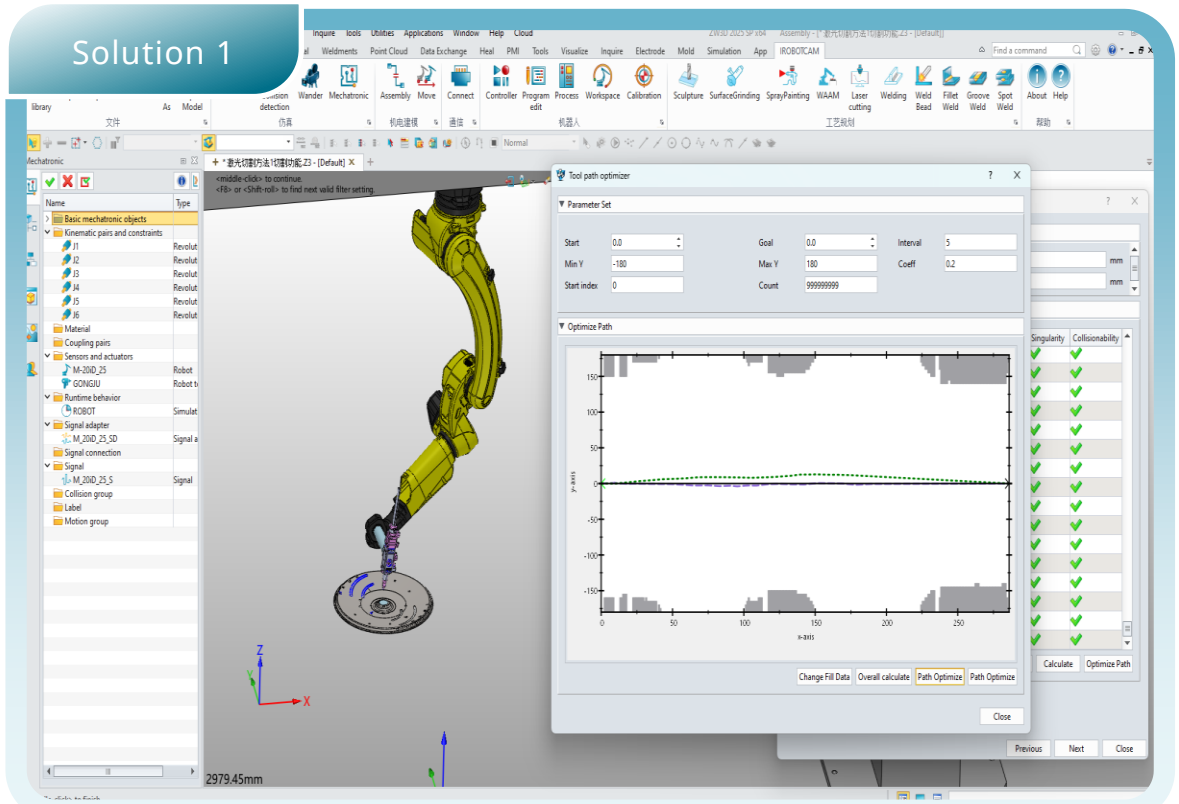
Laser Cutting Process Application

Traditional programming methods struggle to handle complex factors, making it difficult to adjust parameters in real time and ensure high-precision cutting.

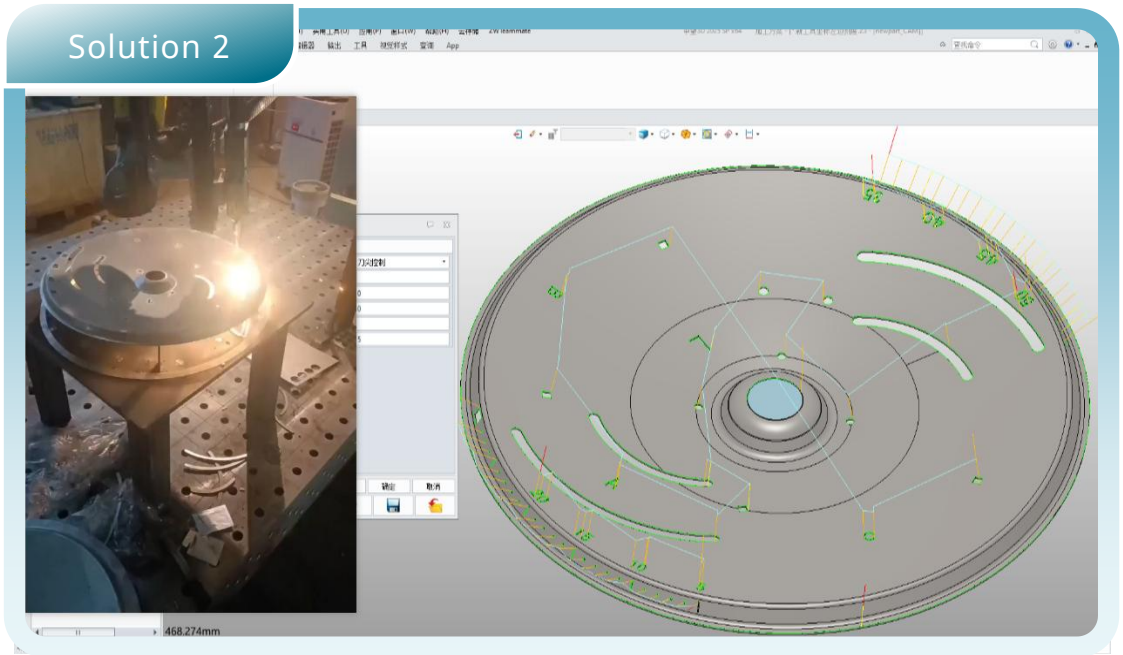
1.Precise Path Planning Algorithm
2.Real-Time Parameter Coordination
3.Virtual Simulation Preview & Optimization

iRobotCAM's independently developed technology deeply integrates with high-end robots and laser equipment to generate optimized cutting paths, which are verified and adjusted multiple times through virtual simulation.

Solution 1



Solution 2



Uses processing solutions to quickly generate high-precision cutting trajectories, verify through physical processing simulation, import CL programs to convert into robot processing points, and optimize paths.

Achieves one-time high-precision cutting in actual processing, with mold dimensional accuracy and surface finish reaching extremely high standards, reducing subsequent processes and improving production efficiency and product quality.

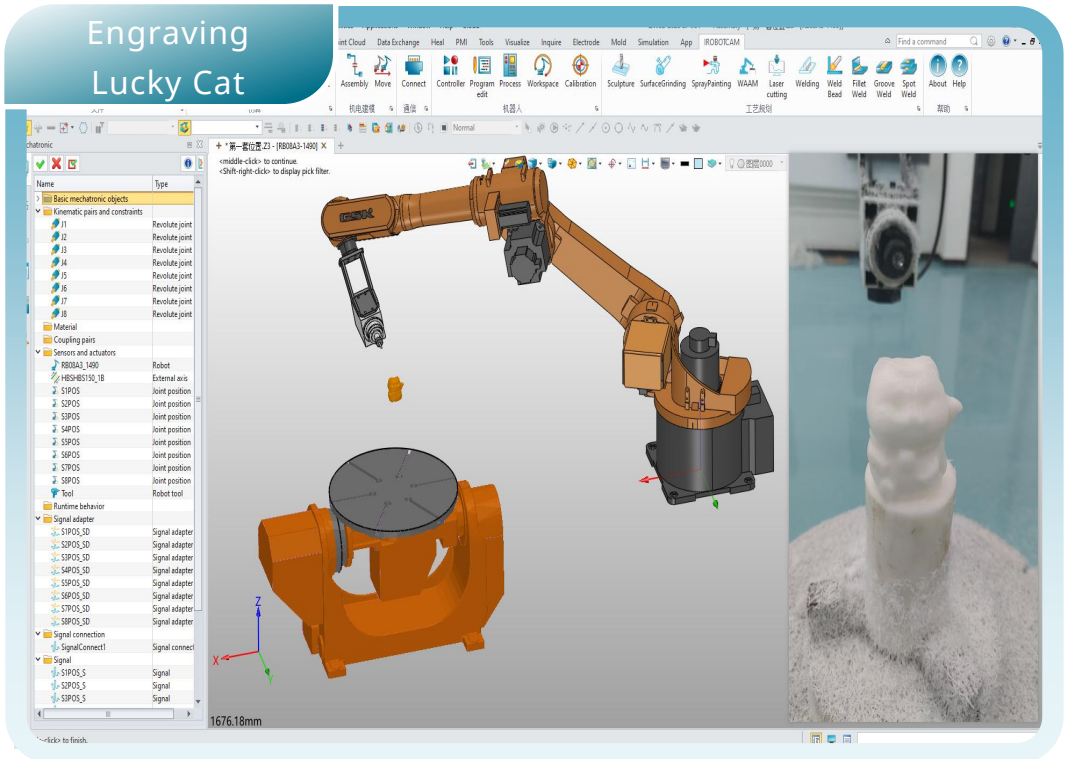
Engraving Process Application

The iRobotCAM robot library enables easy import or customization of robot models, while quickly establishing a digital model environment for workpieces, fixtures, and other components.

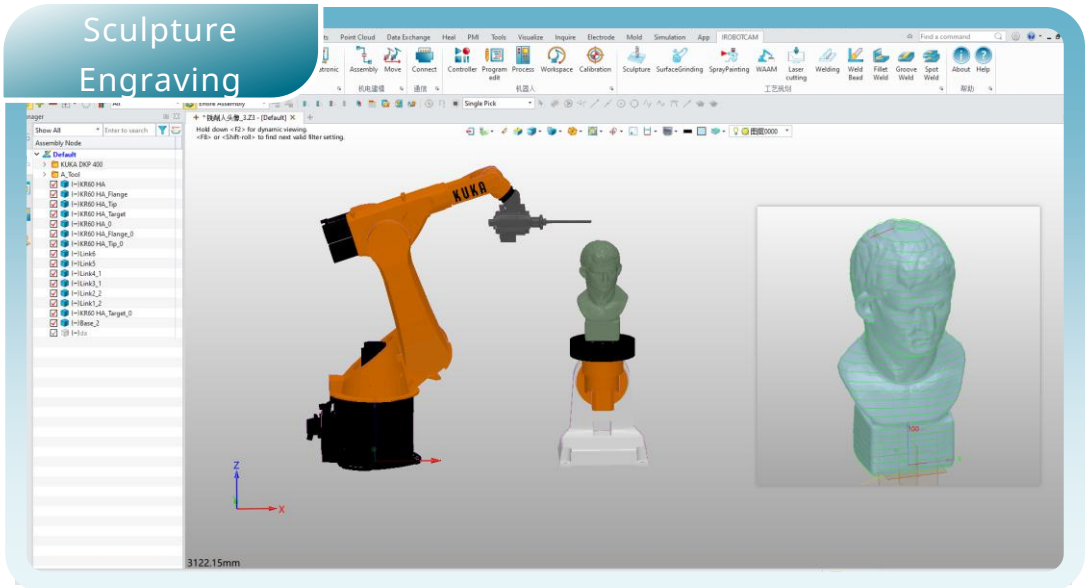
Developed on a 3D CAD platform, leveraging the high-precision characteristics of CAD to achieve architectural advantages in robot applications, ensuring efficient collaboration between model updates and trajectory generation.

Generates roughing and finishing trajectories for models in multiple formats, ensuring precise control over processing accuracy.

Engraving Lucky Cat



Sculpture Engraving



Rich robot trajectory processing algorithms quickly convert 5-axis and other machining trajectories into robot language, enabling comprehensive engraving trajectory planning.

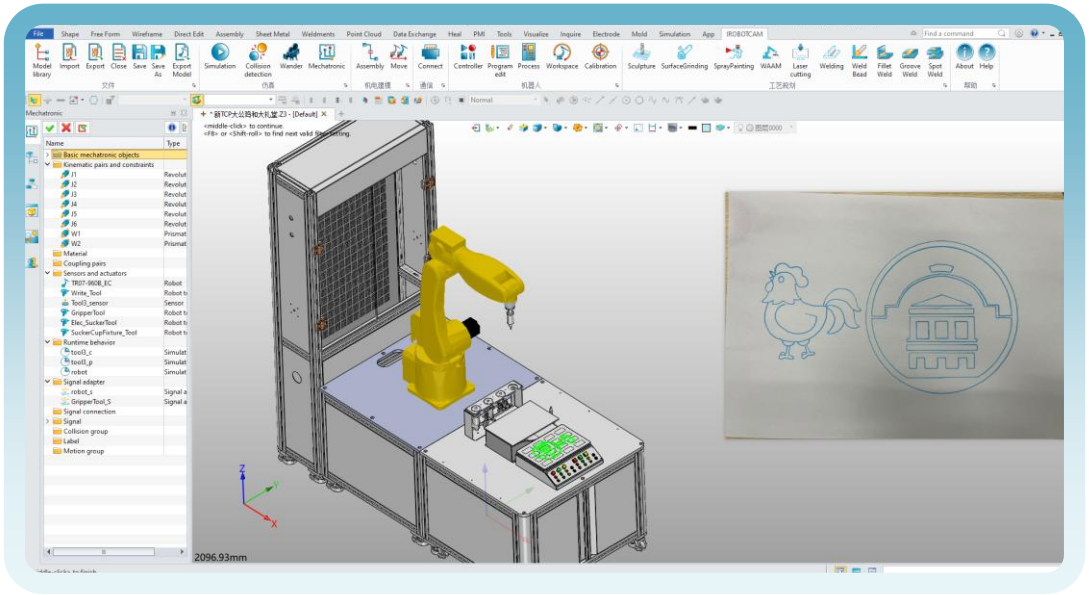
Intuitively visualize robot trajectory and detect collisions through simulation to ensure precision in complex surface engraving

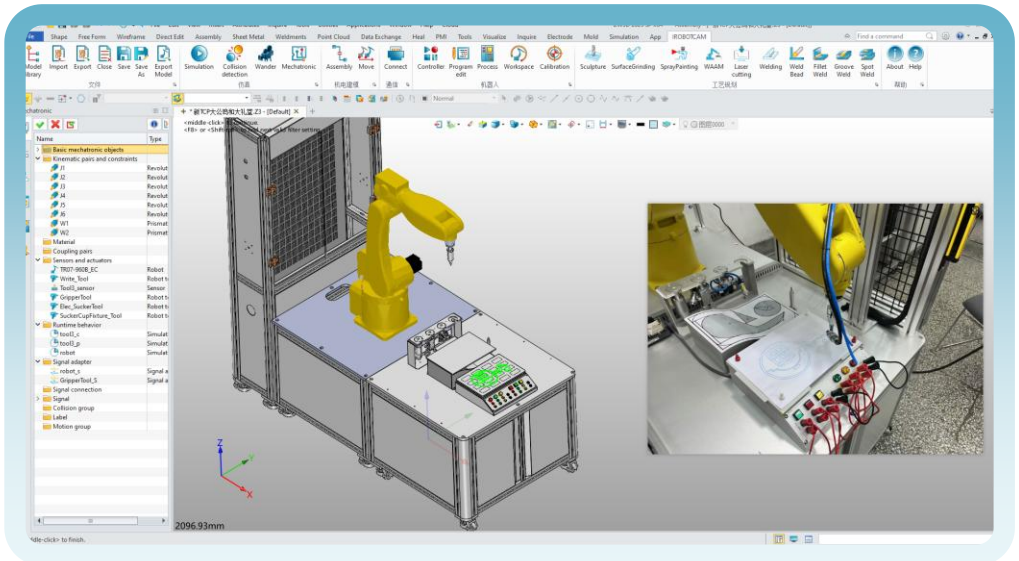
Southeast University Robot Painting Project

Achieves workpiece positioning in all working conditions based on CAD features

Automatically generates painting paths through algorithms

Supports trajectory optimization and collision detection





Visually simulates robot trajectory operation, real-time detection of path accessibility, singularity, and collision risks.

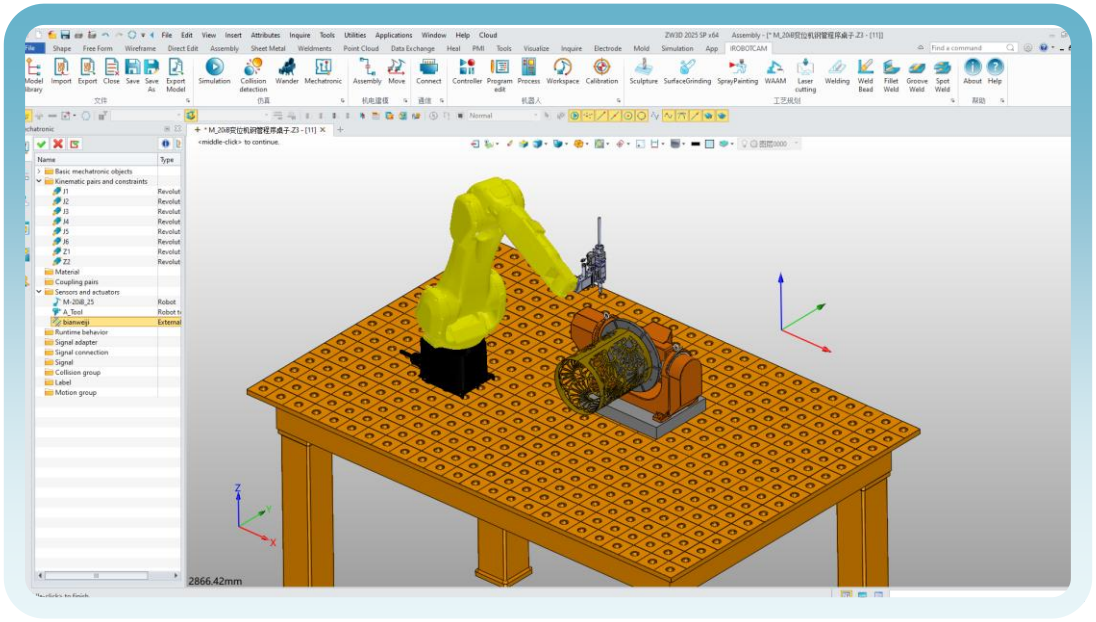
Rapidly adapts to changes in workpiece models and processing requirements, updating robot programs without reprogramming, significantly saving time and effort.

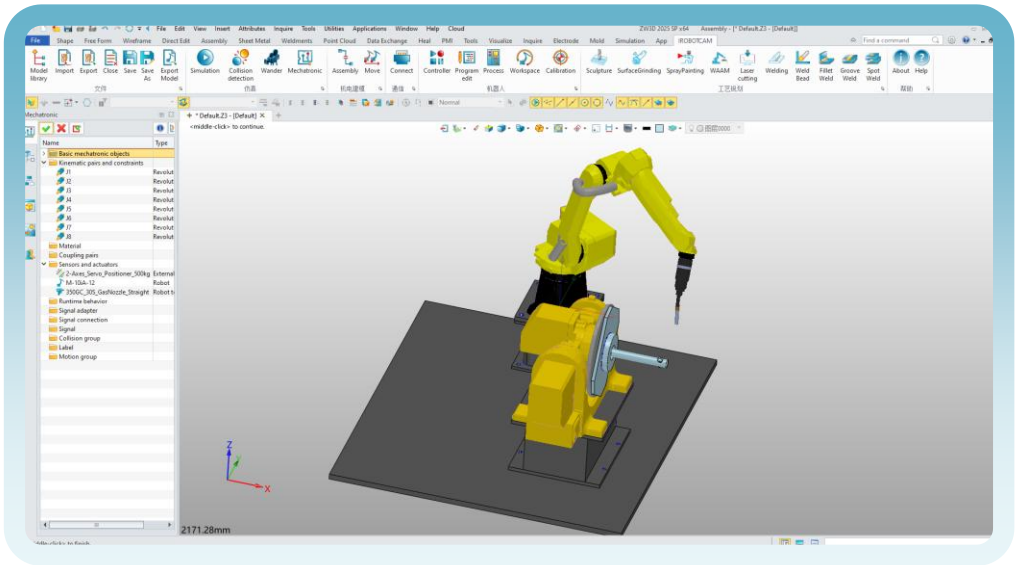
Robot - Positioner Collaboration

Leverages the ZW3D kernel to quickly digitize equipment and processes

Supporting post-processing adaptation for multi-brand robots (FANUC, ABB, KUKA, GSK, etc.)

Achieves workpiece positioning in complex conditions based on CAD features





Uses CAD features for workpiece positioning, automatically generates multi-axis machining trajectories, and supports complex engraving applications for robots with 7+ axes.

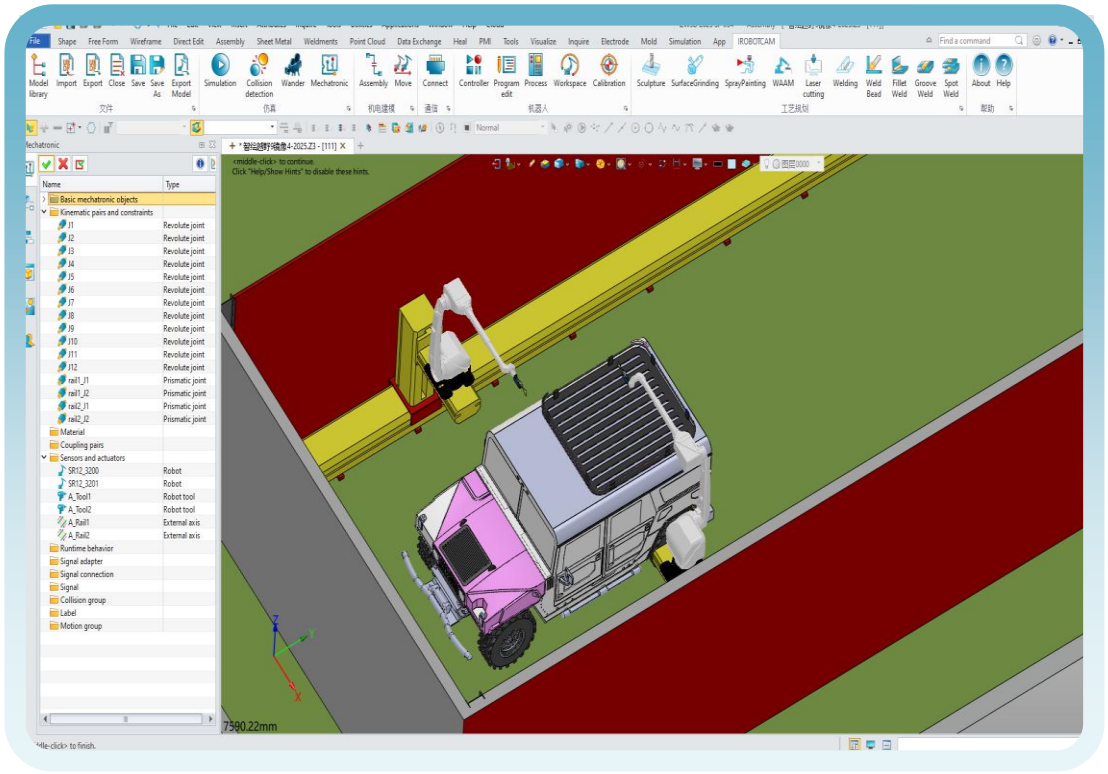
Proactively detects robot motion interference, singularity, accessibility, and path errors to ensure safe and efficient actual production.

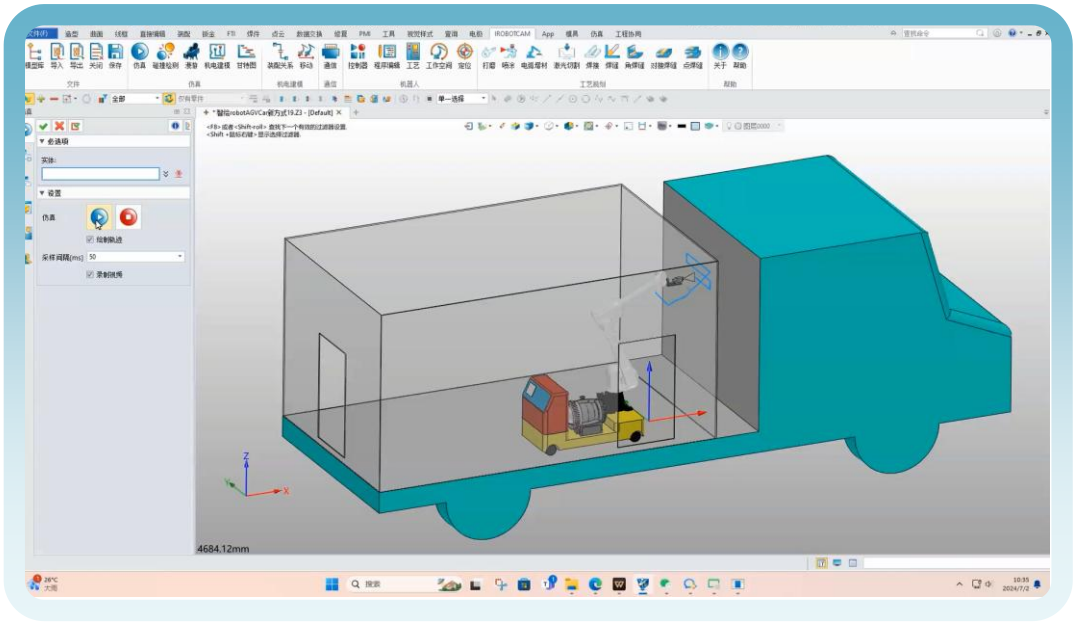
SPRAYING ROBOT Painting Application

Leveraging iRobotCAM's integrated solution, the automation and intelligent optimization of painting path planning were successfully achieved.

Ensures uniform and precise painting quality for complex curved workpieces, significantly improving programming efficiency and production flexibility.

Benefits from an open process architecture and a robust physics engine to enable seamless integration between painting simulation and actual commissioning.

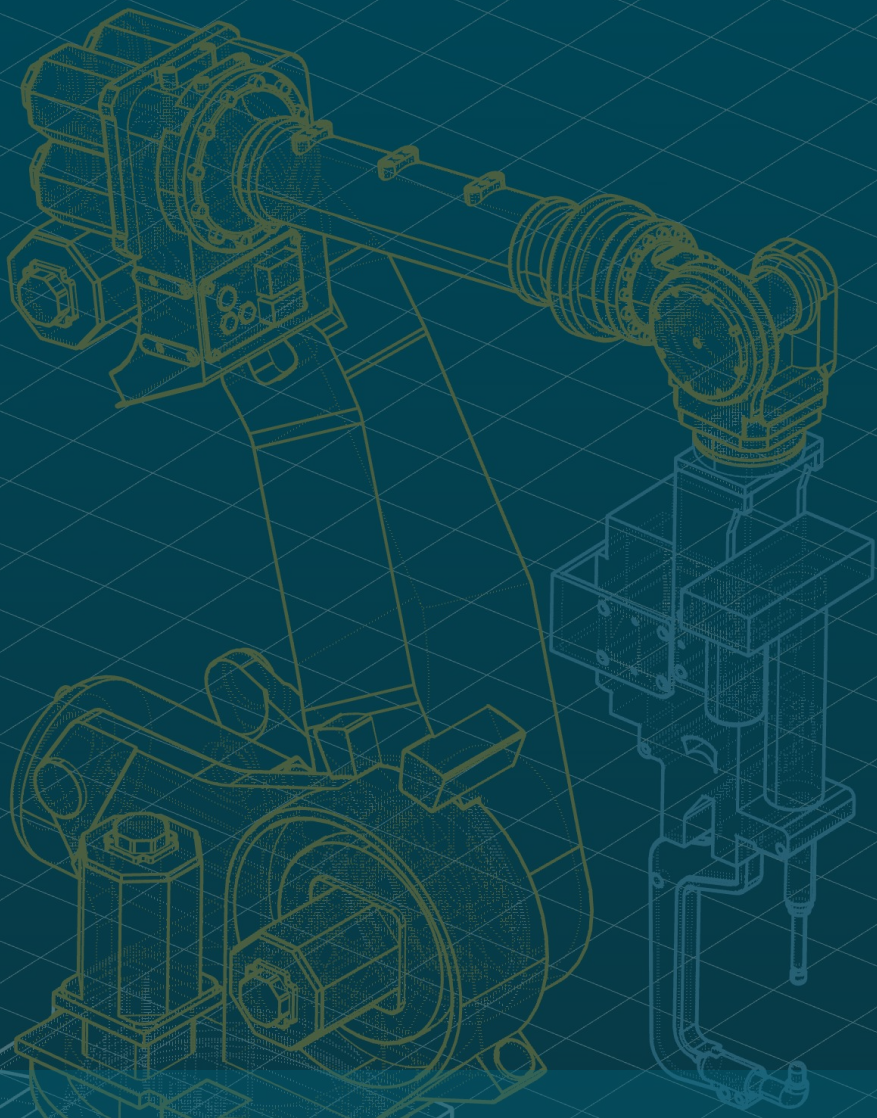




Deep collaboration with SPRAYING ROBOT significantly reduces debugging time and costs, ensuring high precision and consistency in painting processes.

Combining iRobotCAM's technical expertise in offline programming and virtual commissioning, a proprietary offline programming solution for high-end painting equipment production lines was co-developed, covering the entire process from path design, process optimization, to production line joint debugging.

越擎科技



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