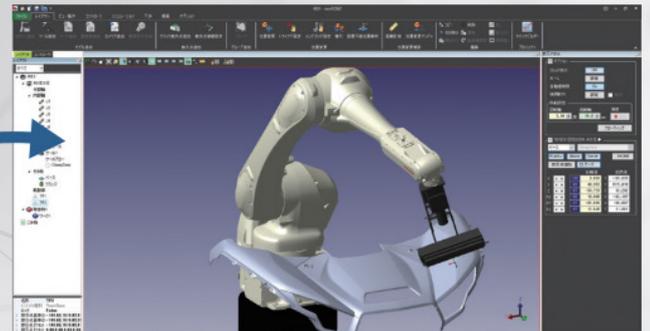


KAWASAKI HEAVY INDUSTRIES CASE STUDY

ADVANCED OFFLINE ROBOT PROGRAMMING WITH COMPREHENSIVE 3D CAD INTEGRATION

 **neoROSET**



Market
Heavy Industries, Robotics,
Manufacturing Automation

Product & Services
CGM Modeler, 3D InterOp,
HOOPS Visualize, AGM

SUITE OF INDUSTRIAL ROBOT PROGRAMMING AND SIMULATION SOFTWARE

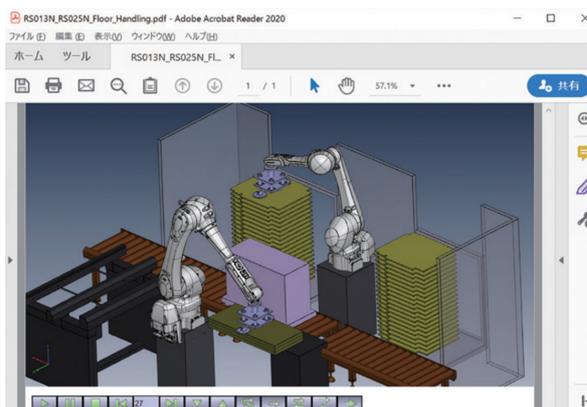
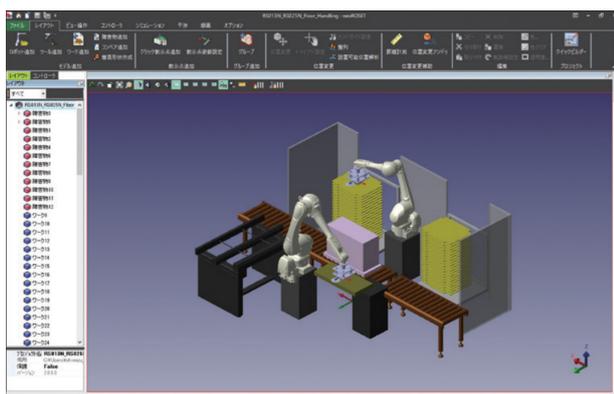
Kawasaki Heavy Industries needed advanced 3D modeling and visualization capabilities to enhance their offline robot programming solution and streamline manufacturing automation processes.

SUMMARY

The collaboration with Spatial revolutionized Kawasaki Heavy Industries' (KHI) approach to robot programming. By integrating a comprehensive suite of Spatial SDKs into their neoROSET solution, KHI achieved significant improvements in design accuracy, operational efficiency, and user experience. This integration enabled simultaneous CAD teaching and simulation, reducing the complexity of development and the need for advanced CAD kernel knowledge.

Through CGM Modeler, 3D InterOp, HOOPS Visualize, and the AGM development framework, KHI gained the right technology to ensure accurate geometric representation, seamless CAD translation, and high-quality visualization — all within one connected environment.

The integration enabled rapid validation of robot implementation without disrupting on-site operations, while dramatically reducing both training costs and development time.



THE COMPANY

Kawasaki Heavy Industries, Ltd. is a global engineering leader with a history of more than 100 years, known for delivering advanced technologies across transportation, energy, industrial equipment, and robotics. Supported by a network of over 100 affiliated companies worldwide, Kawasaki develops solutions that span land, sea, air, outer space, and deep-sea applications.

With more than 50 years of expertise in industrial robotics, KHI has been a pioneer in automating manufacturing processes using 3D CAD data to drive robot implementation. Building on this long-standing experience, the company developed neoROSET, an innovative software platform that streamlines workflows, reduces labor hours, and enhances quality throughout the full lifecycle of industrial robot deployment. The solution supports all sectors integrating robotics, with a strong focus on automation feasibility studies and robot teaching operations.

“ By introducing AGM, we were freed from the constraints of developing geometry processing and visualization functions from scratch in CAD application development. Compared to traditional CAD add-on development, AGM offers greater flexibility, allowing us to focus more time on value-added tasks related to implementing robotic systems. ”

~ Mr. WATANABE Masayuki,
Senior Staff Officer, Technical
Planning Department, Kawasaki
Heavy Industries



CHALLENGE

Automating Complex Robot Teaching Processes

Kawasaki Heavy Industries faced significant challenges in automating robot teaching processes based on 3D CAD data. Traditional robot teaching tasks, especially for products composed of complex 3D geometries, required significant time and effort from highly skilled engineers. Accurate shape representation was critical, as products with complex 3D geometries demanded highly precise modeling capabilities to ensure proper robot path planning.

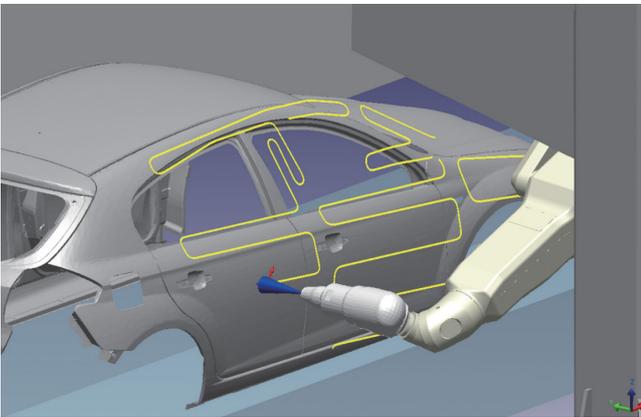
Technical and Development Hurdles

The company encountered multiple technical obstacles that hindered efficiency. Variations across different CAD formats created inconsistent conversion results, requiring considerable investigation time and causing development delays.

Differences in model tolerance and topology between CAD systems often caused gaps or overlaps in geometry, complicating data conversion and robot teaching.

High-quality visualization was essential for identifying exactly where automatically generated machining points were placed on CAD data during robot teaching.

Additionally, the complexity of developing both simulation and CAD-based robot teaching solutions placed a heavy burden on engineers, significantly increasing development costs. KHI needed to find a way to leverage existing technologies rather than building everything from scratch.



SOLUTION

Precise 3D Modeling with CGM Modeler

When KHI embarked on developing neoROSET, they partnered with Spatial to integrate a comprehensive suite of SDKs. To automate teaching processes based on 3D CAD data, KHI adopted CGM Modeler for its highly accurate shape representation capabilities. CGM Modeler improved the efficiency of teaching operations, allowing engineers to automate path creation for even the most complex geometries.

Unified CAD Translation with 3D InterOp

For CAD format compatibility, 3D InterOp provided unified support for conversion outcomes across different formats. 3D InterOp improved CAD data conversion accuracy, ensuring precise translation across multiple formats and reducing geometry inconsistencies. Integrated seamlessly with CGM Modeler, this solution freed KHI engineers from the stress and time consumption associated with data translation variations, leading to dramatically improved development efficiency.

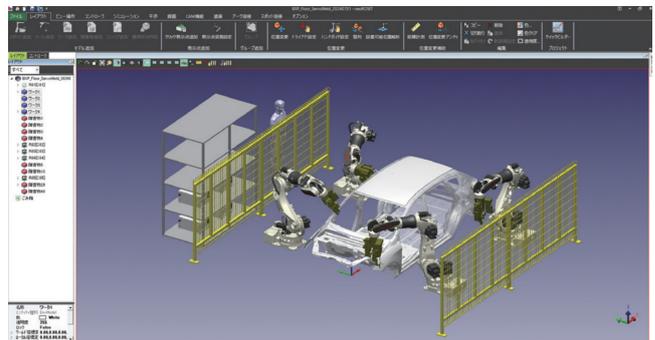
Advanced Visualization with HOOPS Visualize

HOOPS Visualize provided a flexible, high-performance 3D rendering engine capable of handling both lightweight and highly detailed geometry, delivering high-quality visualization that improved the verification of teaching points and robot paths directly on CAD data.

This enabled smooth and clear visualization even for large and complex models, greatly enhancing usability and clarity for identifying automatically generated machining points.

Integrated Development Platform with AGM

By leveraging AGM framework, the SDK sample code provided by Spatial, engineers reduced the need for specialized CAD expertise and improved development efficiency. This eliminated the need for development from scratch and significantly reduced development costs while providing the advanced functionality needed for both simulation and CAD-based robot teaching.



KEY INSIGHTS

Expanding a portfolio with cloud solutions

The integration of Spatial's comprehensive SDK suite enabled Kawasaki Heavy Industries to create a market-leading solution that significantly outperforms their previous robot programming offerings. neoROSET now provides a much more intuitive interface compared to the previous K-ROSET software, with visual programming capabilities and simplified UI accessible even to beginners. With comprehensive CAD format compatibility and integrated healing functionality, the solution minimizes errors, reduces manual rework, and accelerates deployment cycles.

The collaboration with Spatial not only solved immediate technical challenges but also positioned KHI to serve all industrial segments implementing robotics more effectively. The resulting solution reduces training costs and improves quality across the entire robot deployment lifecycle, demonstrating the power of integrated 3D technology in industrial automation.

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Spatial's Japanese engineers possess extensive knowledge and advanced expertise, and we are satisfied with both their technical support and consulting services. ”

~ Mr. WATANABE Masayuki, Senior Staff Officer, Technical Planning Department, KHI



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manufacturing with
advanced simulation
technologies.

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application ahead of the
competition?

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About Spatial Corp

Spatial Corp, a Dassault Systèmes subsidiary, is the leading provider of 3D software development toolkits for technical applications across a broad range of industries. Spatial **3D modeling**, **3D visualization**, **3D meshing** and **CAD translation software development toolkits** help application developers deliver market-leading products, maintain focus on core competencies, and reduce time-to-market. For over 35 years, Spatial's 3D software development toolkits have been adopted by many of the world's most recognized software developers, manufacturers, research institutes, and universities. Headquartered in Broomfield, Colorado, Spatial has offices in the USA, France, Germany, Japan, China, and the United Kingdom. For more information on Spatial's latest updates and product offerings, please visit www.spatial.com.



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