STÄUBLI CASE STUDY

POWERFUL 3D ENGINE BRINGS HIGHLY REALISTIC REPRESENTATION TO ROBOTICS SOFTWARE

Market
Industrial Automation/ Robotics

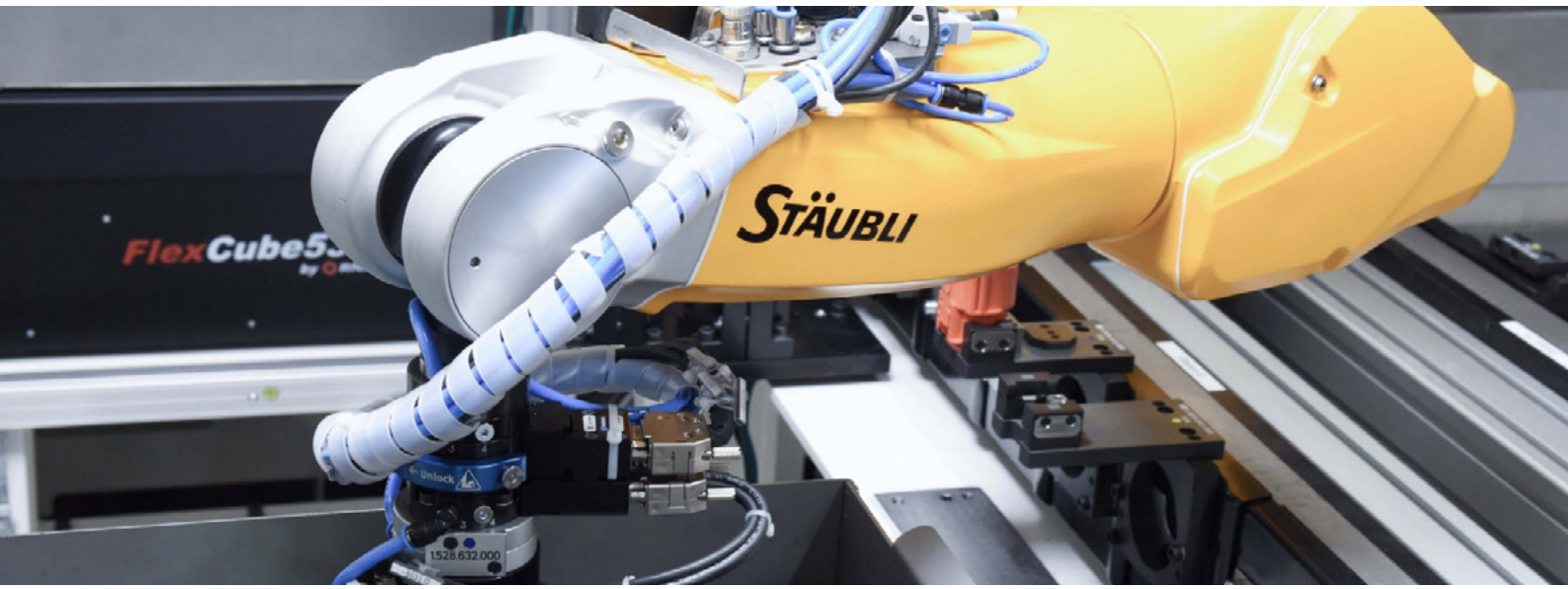
Product & Services
CGM Modeler, CGM Polyhedra, 3D InterOp, HOOPS Visualize

BRINGING 3D ROBOTIC FRAMEWORKS TO LIFE

Stäubli was seeking a 3D engine that was powerful enough to open new possibilities in their software enabling them to prepare for the next five to ten years in the market.

SUMMARY

CGM Modeler enabled improvements to the development environment in the Stäubli Robotics Suite, including new functionalities that assist in delivering realistic representation.



THE COMPANY

Stäubli is a mechatronics solutions provider with three dedicated activities: Connectors, Robotics, and Textile. Originally founded in 1892 as a small workshop in Horgen/Zurich, today, Stäubli is an international group headquartered in Pfäffikon, Switzerland. Stäubli operates fourteen industrial production sites and 29 subsidiaries worldwide, with a global workforce of over 5,500 agents in 50 countries, delivering innovative solutions to all industrial sectors.

Stäubli Robotics, a division of Stäubli, is a leading global player in robotics, consistently delivering effective and reliable engineering, service, and support. A complete solutions provider for digitally networked production, Stäubli offers a broad range of 4 and 6-axis robots, including robotic arms designed specifically for sensitive environments, autonomous mobile robots, driver-less transport systems (AGVs), and cobots for human-robot collaboration.

"The world of possibilities in the robotics industry is exciting. Robots are the most flexible equipment to automate production. Working with Spatial means working with the leader in 3D environments and gives us even more confidence about the solution that we bring to our customers."

— Edouard Guillaume, Marketing Manager, Stäubli Robotics

Watch Full Interview with Edouard Guillaume

In November 2021, Stäubli released their Robotics Suite 2022, which included improvements to the development environment as well as new functionality. Functionality in the Stäubli Robotics Suite spans all usage scopes, from design, simulation, and setup debugging to production and optimization.

These improvements came about when Stäubli partnered with Spatial Corp to utilize their powerful 3D engine: CGM Modeler. CGM provided the Stäubli Robotics Suite with high-quality representations that previously could not be achieved.

Stäubli Robotics Products:

- Industrial robots: 4 and 6-axis robots
- Collaborative robots (cobots)
- Mobile robots
- AGV platforms: modular AGV platforms
- AGV forklift
- Stäubli Robotics Suite and Stäubli Robotics Control

Industrial Applications

Stäubli Robotics products are hard at work within a variety of industries. In Mexico, high-voltage connectors for electric vehicles use robot-assisted assembly via six ceiling-mounted Stäubli robots and 13 image processing systems. An Italian equipment manufacturer that supplies liquid filling lines for vials for the pharmaceutical industry uses Stäubli's Stericlean range of robots to create a germ-free environment. In another innovative example, a powerful Stäubli six-axis robot proves its capability for handling 80-kilogram cheese wheels at a dairy farm in Germany.

Additional industrial applications for Stäubli products include improving machine autonomy, deburring engine components, Stericlean robots in vaccine production, and the first robotic platform for surgical assistance.

CHALLENGE

Future Proofing an Application

The general trend toward automating industrial production assembly lines and system solutions is ongoing. This regularly poses challenges for machine and system builders because, despite the desire for standardization, the specific framework conditions and existing structures onsite at a customer's location often require individual designs far off from these standards.

When Stäubli first approached Spatial they were specifically looking for a 3D engine that was powerful enough to open new possibilities in their software that would enable them to prepare for the next five to ten years in the market.

SOLUTION

Using the right 3D engine to enable robust features

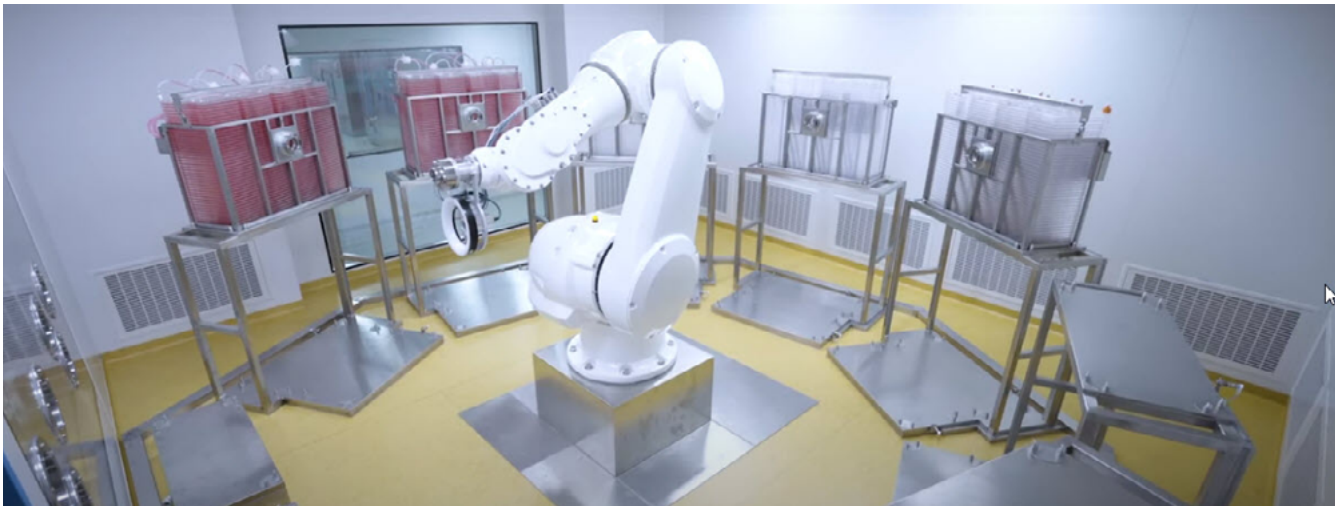
The Stäubli Robotics Suite 2022 offers optimized and powerful features that allow both standard and special solutions for complex automation scenarios to be readily visualized, simulated, validated, and realized. These features were enabled by Spatial's CGM Modeler.

Spatial's CGM Modeler enabled improvements to the development environment in the Stäubli Robotics Suite, including new functionalities that assist in delivering realistic representation.

The Benefits of CGM within Stäubli Robotics Suite:

- Smooth, jerk-free, 3D representations, even when simulating extensive production lines, are displayed in high resolution down to the smallest detail.
- Significant reduction in the number of mouse clicks within the Suite, with visible results being generated quickly and easily.
- STEP files can be imported even faster via drag and drop.
- Direct transfer of the Safety Configuration between Stäubli Robotics Suite 2022 and the CS9 controller
- Positioning is more intuitive

Spatial's CGM Modeler is the modern, 3D engine that enables these robust functionalities in the Stäubli development



Stäubli Robot Used in Vaccine Production

environment, making it an extremely powerful engineering tool with high performance and ease of use. Additionally, Spatial's interoperability, modeling, and visualization components easily integrate for higher performance capabilities with increased ease-of-use. Because of this, Stäubli also utilized Spatial's CGM Polyhedra, 3D InterOp, and HOOPS Visualize within their Robotics Suite.

Software Development Kits Bring 3D Robotic Frameworks to Life

When it came time to build a 3D robotic framework, Staubli utilized Spatial's 3D Software Development Kits (SDKs) to streamline development. Spatial SDKs are a single source, completely integrated solution from which the application developer benefits from the Spatial engineering team's in-depth experience. Utilizing Spatial SDKs reduces development costs, and time to market; factors that are top of mind for Stäubli in the fast-evolving robotics industry.

Stäubli was seeking a technology partner who had historical expertise and guidance on which to lean. With SDKs, Spatial leverages decades of highly engineered software capabilities and Dassault Systèmes best of breed technology, which is then passed onto their customers who deliver a more robust product in the end.
The SDKs provided flexibility for integrating new modules when needed, robot kinematics architectures, and the development

Auxillary Pharma Processes

The Features of The Stäubli Robotics Suite

CGM helps the Stäubli Robotics Suite enable useful and value-added capabilities for the creation of new and innovative digitally networked productions. The updated, CGM-enabled, development environment within the Stäubli Robotics Suite involves all areas of usage including design, simulation, setup debugging, production, and optimization.

FEATURE	PURPOSE/GOAL
Reduction in mouse clicks	Visible results are generated quickly and easily.
Snap Replace function	Simplifies the transition from the static designing environment to the dynamic Stäubli development environment.
Integrated component catalogue of parts	Frequently used parts or assemblies can be stored in a collection. Provides faster access and speeds up process.
Snap Function	Position objects/components, or simply move the robot to a desired position without having to create position variables in advance.
Position Optimizer	Guarantees the automatic identification of the ideal position for the robot to reach every point desired.
Integrated Screen Capturing	User can record the simulated robot tasks at each work step and send it to the customer as an mp4 file.
Integrated Control Panel	Supports the user in optimizing processes and movements during the simulation. Reduces the time required for recurring work steps.
Safety Configuration direct transfer	Allows for direct transfer between Stäubli Robotics Suite 2022 and the CS9 controller.

Stäubli Robotics Suite

of a Collision Detection Tool to convert old VRML cells from a previous solution provider. When customizations were needed to fully flush out the workflow, Spatial experts worked on making the necessary improvements.

Spatial's attention to the workflow development allowed the Stäubli team to focus on their area of specialty, creating a highly effective process.

Spatial's technology experts assisted by analyzing the feasibility of modeling algorithms and workflows that would enhance Stäubli's application for years to come. This was key for the leaders at Stäubli who wanted a product that would be useful in different robotics industry applications, now and in the future.

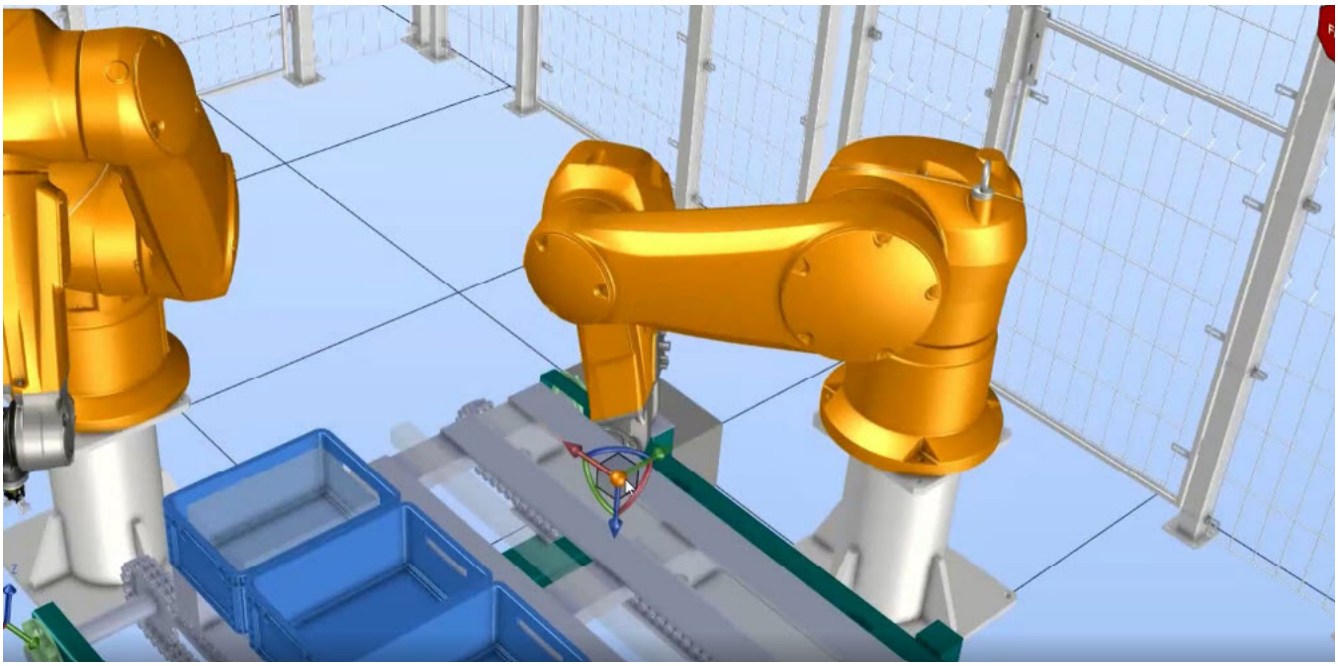
The outcome of implementing SDKs for the Stäubli Robotics Suite spoke to the efficient and collaborative nature of the partnership. Spatial experts applied their historical knowledge during the Stäubli Robotics Suite development process, and together the two teams uncovered solutions faster and prepared the product for launch in a timely manner.

Proven Success Through Collaboration

Two months before Stäubli planned to launch their Robotics Suite, an event occurred that highlighted the effectiveness of the partnership with Spatial. When recording the software for an upcoming promotion, an instability of the Stäubli Robotics Suite was discovered that inhibited registration of the software.

Stäubli's development team worked on the issue internally, as well as sought additional help from the Spatial technical support team. A specific task force was set up with five individuals from Spatial who conducted daily follow-ups in order to find the root cause of the issue and meet the release date. This collaborative example is indicative of the nature of SDKs and the efficient partnership that is formed through collaboration.

KEY INSIGHTS



Modular and Adaptive Solution

Stäubli sought a solution for their Robotics Suite that would position them for success in the future of the robotics market, an outlook they viewed five to ten years out. Their vision is long-term, and they are continually learning about new applications in new market sectors of this exciting industry. Additionally, they sought a modular solution because their previous system was large, inflexible, and not adaptable to their needs.

Stäubli has proudly worked with Spatial's parent company, Dassault Systèmes, and their CATIA product for nearly 30 years. They knew that by utilizing Spatial's SDKs, Stäubli's developers would benefit from a mature product that comes with the value-add of years of software engineering and easy integration with other software and file types created by Dassault Systèmes. In terms of flexibility, Stäubli developers can now add new modules, use the ones they want, and ignore the ones they don't need. This freedom of integration was key for Stäubli developers; they did not want to feel locked inside a complete end-to-end solution.

The capabilities that Spatial's SDKs provide help deliver the kind of realistic representation in the Stäubli Robotics Suite previously reserved for the B2C and gaming sector. With the updated development environment in their Robotics Suite, Stäubli is positioned to rocket toward the robotics industry's limitless possibilities.

STÄUBLI

Learn more about Staubli and their robotics software solutions.

Connect with Staubli

SPATIAL

Ready to catapult your application ahead of the competition?

Connect with Spatial

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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