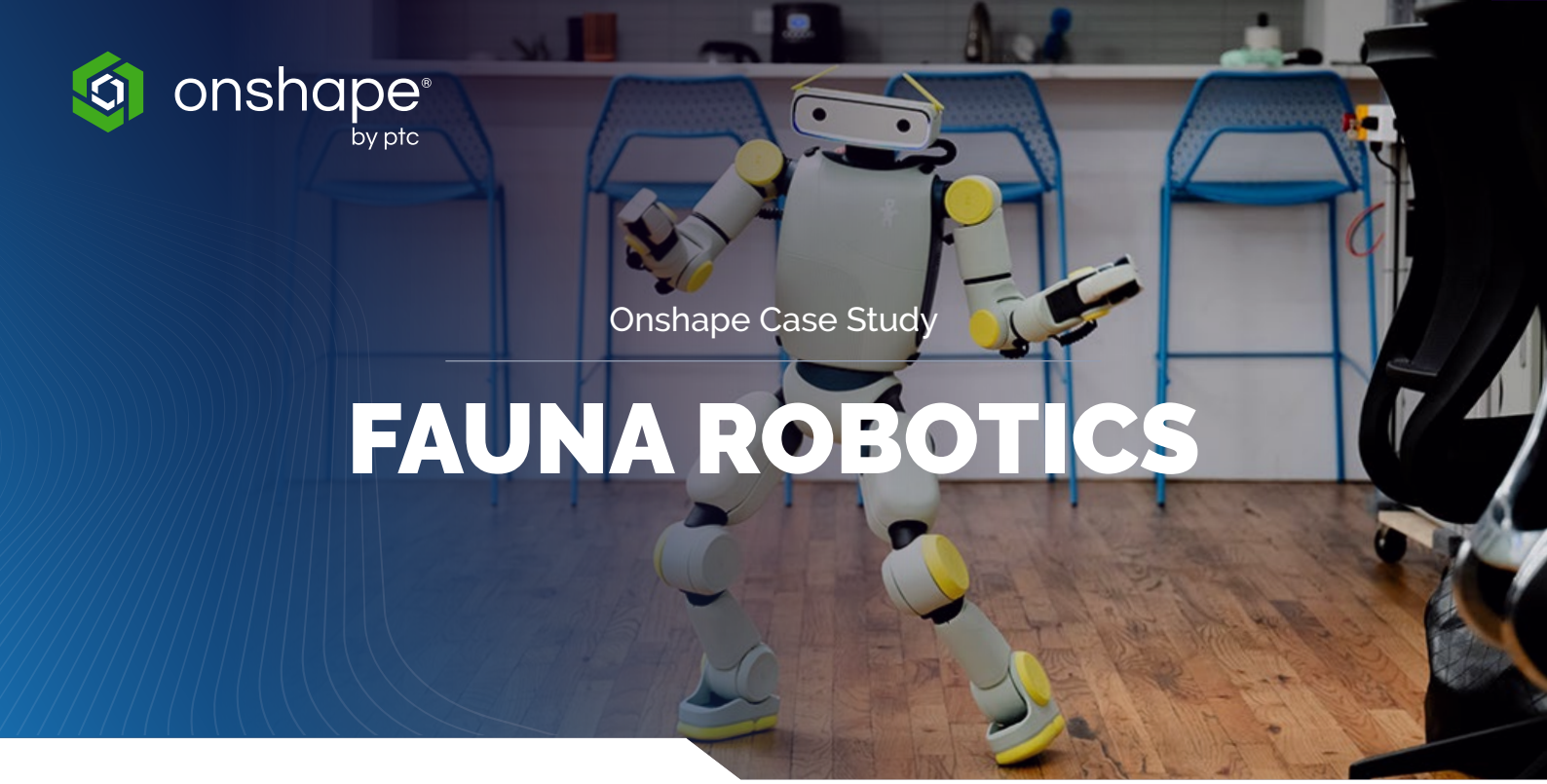
onshape® by ptc



Onshape Case Study

FAUNA ROBOTICS

fauna robotics

INDUSTRY: ROBOTICS

The Challenge

Most robots today are designed for structured environments like factories and warehouses. Fauna Robotics is pursuing a much more ambitious goal: robots designed to operate safely alongside people in everyday spaces.

Founded with the belief that robots should adapt and respond to the world around them rather than the other way around, Fauna Robotics built Sprout, a humanoid robot platform designed for experimentation and development. Instead of being built for a single task, Sprout gives researchers and organizations a flexible foundation to build on, from universities, to advanced AI research, and real-world applications in retail and corporate settings.

“Our vision is that humanoid robots should be designed for humans,” says Anthony Moschella, VP of Product and Hardware at Fauna Robotics. “We wanted to build something that is safe, friendly, and easy to deploy so developers around the world can start exploring how robots and humans interact in the same space.”

Building that vision required extremely fast hardware development cycles. Mechanical systems, industrial design, electronics, and simulation environments all needed to evolve together as the team refined designs. And because Sprout is a developer platform, Fauna’s downstream engineering workflows need to scale quickly. APIs, simulation tools, and integration pipelines have to connect design data with robotics software environments.

Traditional file-based CAD systems saddled with outdated design workflows and heavy administrative overhead weren't going to cut it. Fauna turned to PTC's Onshape: a modern, cloud-native CAD+PDM partner that supports real-time collaboration, rapid experimentation, and built-in product data management from day one.

Results

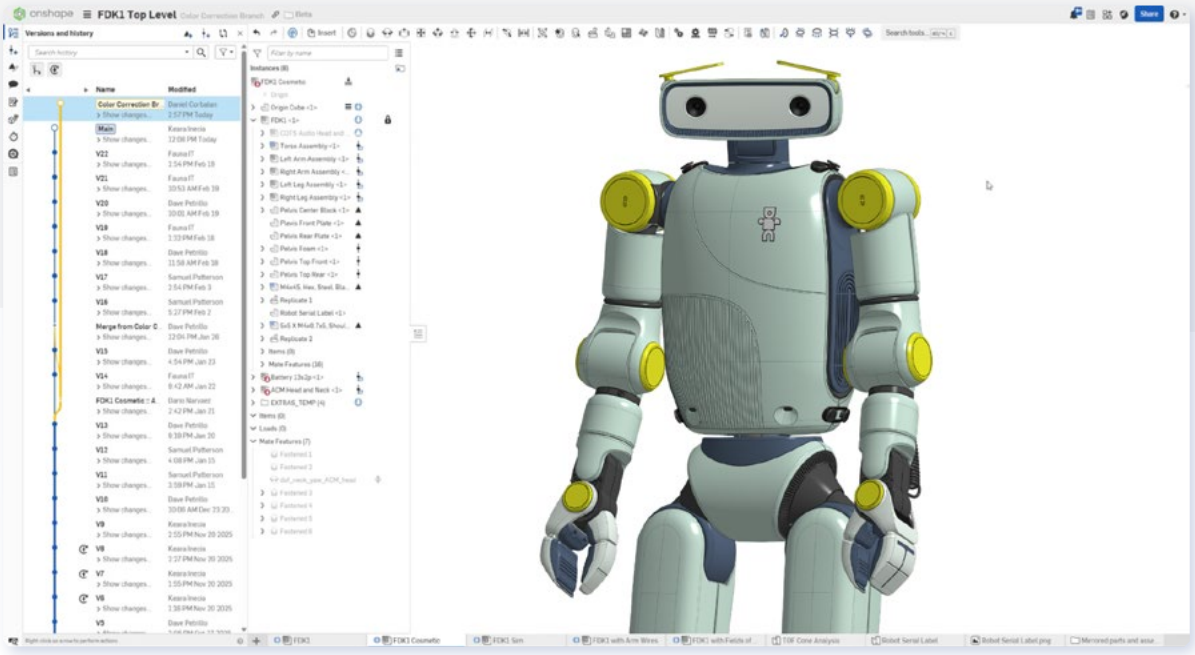
- **Enabled real-time collaboration**
  between designers and engineers working in the same shared design environment
- **Accelerated design experimentation**
  with Onshape's built-in PDM, allowing for rapid prototyping without disrupting the main assembly
- **Connected CAD data to downstream workflows**
  through Onshape's open API integrations
- **Streamlined prototyping and manufacturing releases**
  with real-time Bill of Materials (BOM) management and revision control

"Everything we did from beginning to end was optimized for speed. Onshape helped us manage releases without making mistakes or shipping out old revisions, so we could get prototypes built as quickly as possible."

– **Anthony Moschella**, *VP of Product and Hardware, Fauna Robotics*

How Fauna Robotics Is Leading Humanoid Robot Development with Cloud-Native CAD & PDM

The robotics company iterates rapidly and manages complex hardware development collaboratively with PTC's Onshape.



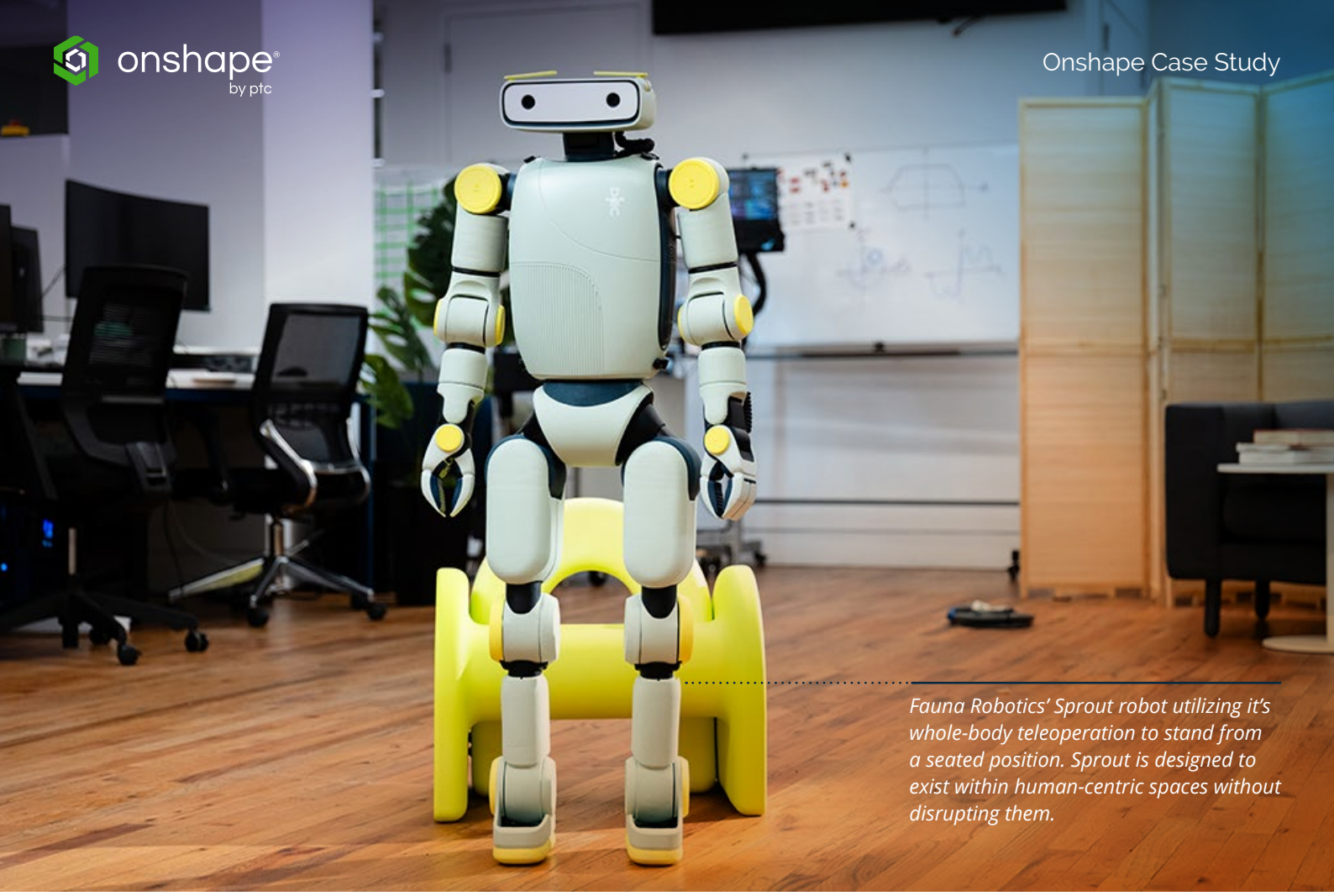
Fauna Robotics' humanoid robot, Sprout, was designed entirely in Onshape cloud-native CAD+PDM

Real-Time Collaboration Powers Rapid Cross-Disciplinary Design

Humanoid robots bring together an unusual mix of design disciplines. Mechanical structures, electronics, sensors, actuators, and software all need to fit together within a compact, highly integrated system while also maintaining the visual personality and approachability that Fauna wants its robots to embody.

That makes tight collaboration between industrial designers, mechanical engineers, and software engineers essential.

With Onshape's cloud-native platform, Fauna's team works inside a shared design environment where everyone sees the same CAD model in real time.



Fauna Robotics' Sprout robot utilizing it's whole-body teleoperation to stand from a seated position. Sprout is designed to exist within human-centric spaces without disrupting them.

Instead of exporting files or waiting for updated versions, engineers and designers can build directly on each other's work as the design evolves.

"Part of using Onshape in our workflow is being able to collaborate really quickly across multiple designers," says Anthony Moschella, VP of Product and Hardware at Fauna Robotics. "Our industrial designers can develop surface models, and engineers can immediately pick those up and detail the backside of the part. The inherent collaborative nature of Onshape makes that back-and-forth really seamless."

That speed matters not just for engineering efficiency, but for the product vision itself. Fauna has intentionally designed Sprout to feel more approachable than a typical robot platform, which means industrial design and mechanical engineering have to evolve together rather than in separate silos.

"If you look at our robot, the industrial design is quite a bit different," says Dave Petrillo, Fauna's Principal Mechanical Engineer. "It's much more approachable. It's something you actually want to be around. That drove a lot of the design decisions."

Because the entire design process lives in the cloud, Fauna's team can move fluidly between design reviews, engineering changes, and prototype preparation without worrying about file conflicts or outdated models.

Built-In PDM Enables Faster Hardware Experimentation With Less Overhead

Robotics development is inherently experimental. Components are constantly being refined, subsystems redesigned, and new ideas tested against real-world constraints.

Over the past 18 months, Fauna Robotics has developed five distinct generations of its robot platform, each iteration improving performance, reliability, and manufacturability.

Onshape's built-in product data management (PDM) capabilities make that pace of experimentation possible. Instead of duplicating files or creating disconnected prototype assemblies, engineers can branch off the main design, test new ideas, and merge successful improvements back into the core robot architecture.

"One thing about Onshape that has been really powerful for us is the ability to branch off designs and do experiments quickly," says Moschella. "We can prototype lots of subassemblies to test what works and what doesn't, and then integrate those changes back into the main design."

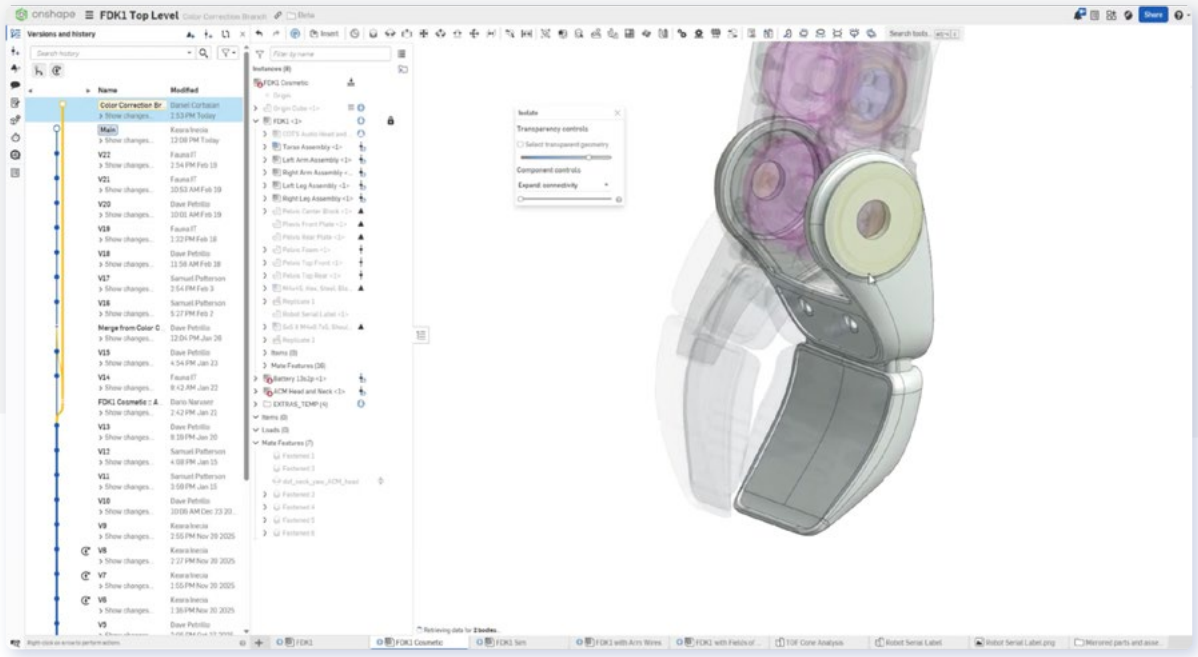
That flexibility is especially valuable in humanoid robotics, where even small changes can ripple across tightly integrated subsystems. For Fauna's engineering team, being able to test and refine subassemblies without destabilizing the broader design helps keep development moving quickly while maintaining control over the broader robot architecture.

Sprout's robust, integrated grippers enable the robot to grip and hold objects without applying too much pressure.

Managing all of that CAD data can quickly become its own engineering challenge. Onshape's built-in PDM ensures every design change automatically becomes part of a fully traceable design history without maintaining separate data infrastructure or needing dedicated IT support.

"One of the biggest advantages of using Onshape is getting your PDM and CAD management essentially for free," Moschella says. "In previous companies, we had entire teams of CAD administrators just to keep everything in sync. That's a tax you don't want to pay as a startup."

Open APIs Help Connect CAD, Simulation, and BOM Workflows



A semi-transparent view of Sprout's gripper in Onshape. Onshape gives Fauna Robotics full design visibility 24/7 for rapid collaboration and prototyping.

For Fauna Robotics, CAD is only one part of the development process. Mechanical design data also needs to flow into downstream operational tools so the team can iterate quickly across both hardware and software. That's where Onshape's open API integrations have become especially valuable.

Built on Amazon Web Services (AWS), Onshape offers Fauna Robotics a secure, resilient cloud foundation for more than CAD alone. By combining cloud-native CAD, integrated data management, and open APIs on AWS's global infrastructure, Onshape enables Fauna to connect design data directly to simulation and bill of materials (BOM) workflows. The result is a single, always up-to-date source of truth that helps the team collaborate in real time, automate downstream processes, and keep critical engineering data secure and accessible.

Fauna uses the Onshape API integration with NVIDIA Isaac Sim™ to connect design data directly into its simulation workflow, making it easier to validate designs virtually as the robot evolves. That API access also supports faster iteration by reducing the manual work required to move data between systems.

"The link between mechanical CAD and simulation is entirely through querying the design data through the Onshape API," says Moschella.

That same flexibility extends into Fauna's downstream operational workflows. The company uses Onshape's API connection with OpenBOM to manage top-level BOM, vendor packages, and release files. Rather than treating CAD as a disconnected design environment, Fauna can use Onshape as the core system connecting engineering data to the broader robotics toolchain.

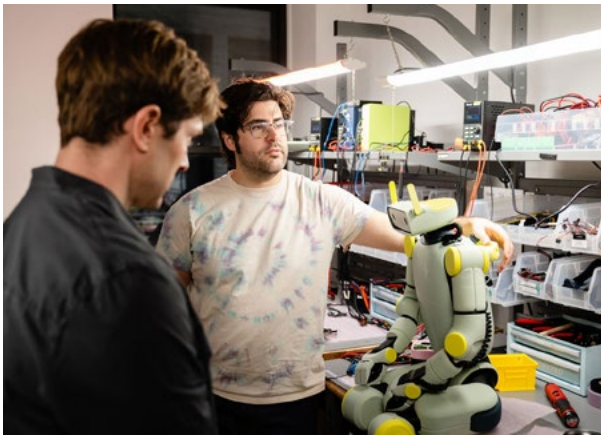
For a robotics company building a developer-friendly platform, that openness matters.

"The API is very well documented," says Moschella. "You can reach in, get the information you need, and build tools that serve your workflow in hours instead of weeks or months."

Streamlining Prototyping, Releases, and Vendor Collaboration

The path from digital design to physical hardware often runs through rapid prototype cycles and frequent vendor collaboration. Fauna optimized its entire development process around speed, moving quickly from concept to prototype while ensuring suppliers always receive the correct design revisions.

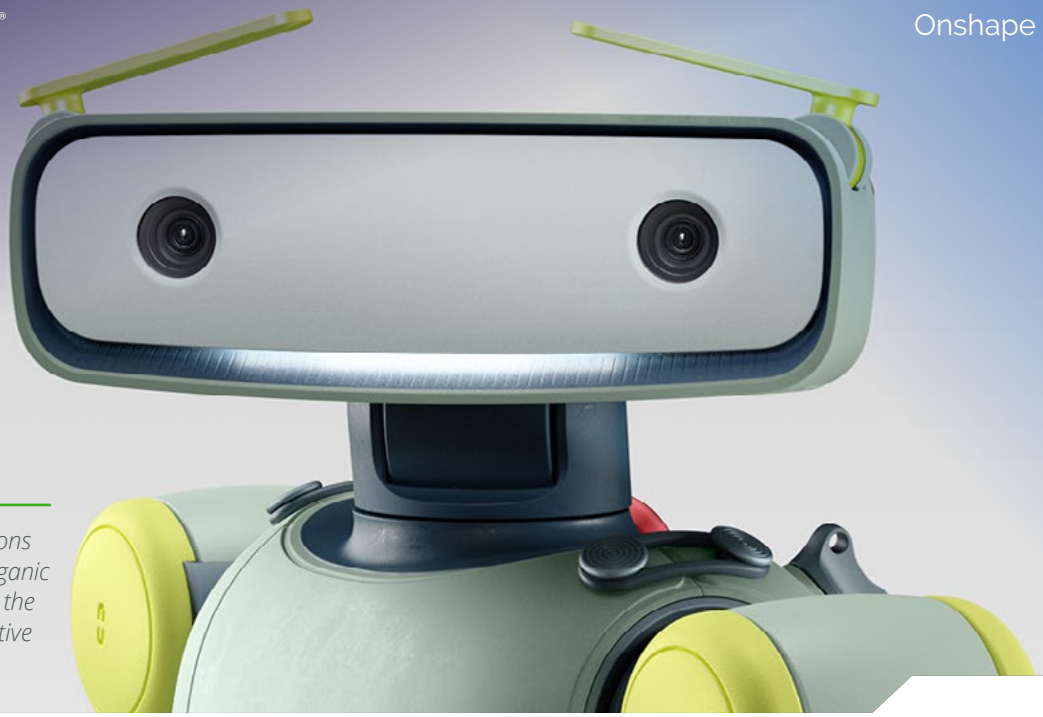
Onshape's integrated release management and real-time BOM management make that process straightforward. Engineers can manage revisions, track configurations, and release designs to manufacturing directly from the same platform used for design.



Fauna Robotics team members evaluating a Sprout robot. Fauna's in-house manufacturing setup allows them to collaborate directly with CAD designers to make adjustments quickly.

"Everything we did from beginning to end was optimized for speed," says Moschella. "Onshape helped us manage releases without making mistakes or shipping out old revisions, so we could get prototypes built as quickly as possible."

That structure is essential when moving a complex robot into prototype builds. With large assemblies and many interdependent components, clear revision control helps ensure the right parts and documentation move downstream at the right time so Fauna gets production-ready prototypes with minimal friction.



Sprout's dynamic expressions allow it to express more organic interactive behaviors, with the goal being a friendly, intuitive user experience.

Building the Foundation for a Developer-Friendly Robotics Platform

Fauna Robotics isn't just building humanoid robots. They are creating a platform designed to support an ecosystem of developers, applications, and future robotic capabilities across industries and environments. Supporting that vision requires an engineering platform that evolves just as quickly as the technology itself.

By combining Onshape's cloud-native CAD with built-in PDM, collaborative design tools, and open APIs, Fauna Robotics moves quickly while maintaining the structure needed to manage complex hardware development.

"With a small team, we're able to move extremely quickly," Moschella said. "Having everything live in the cloud, with collaboration, version control, and configuration management built in, just makes a ton of sense."

As Fauna Robotics continues to refine its platform, Onshape provides the foundation that allows the team to experiment boldly, iterate rapidly, and bring new robotic capabilities into the real world.