SARCOS® | ROBOTICS

Leading the charge in robotic systems designed to maximize workforce potential through increased safety and efficiency.

The Future of Solar Field Construction

Why robotics for solar field construction?

The solar industry is booming. According to the Solar Energy Industries Association (SEIA), solar energy was responsible for 43% – a record 19.2 gigawatts – of all new electricity generated in the U.S. in 2020.

As the demand for solar energy increases, industry analysts expect those numbers to quadruple by the end of the decade, with solar energy powering approximately 1 in 8 residential homes. Globally, data from the International Energy Agency shows that distributed solar photovoltaic (PV) capacity is expected to increase by more than 250% by 2024. How will the industry keep up with this growth? Robotics. Robotic systems developed for rugged outdoor use are ideal for construction applications, including the development of solar fields. These systems must be environmentally hardened and power efficient to be able to perform in challenging conditions and over varying terrains for extended periods of time. Robotic systems for solar construction must include an outdoor-grade robotic arm, appropriate end-of-arm tooling, specialized computer vision to "see" in all outdoor conditions, and intelligent machine learning capabilities. Sarcos is bringing these systems to life and ultimately expanding access to solar energy with autonomous robotic technology for solar field construction. By applying the Guardian® robotic arm systems to repetitive, routine construction tasks,

Sarcos can help the solar industry:

- Improve construction laborer safety, productivity, and quality
- Reduce construction time
- Lower soft costs
- Achieve short-term ROI

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Impediments to Growth

The construction of solar farms currently requires significant manual labor to set photovoltaic modules onto mounting hardware, which poses several challenges. Given the size and bulk of PV modules, this work is hazardous, physically taxing, and ergonomically challenging for laborers. The manual placement of PV modules on their frames requires consistent heavy lifting, which can lead to repetitive stress injuries. As workers become fatigued, mistakes are more likely to occur, such as the incorrect orientation of solar modules, which can significantly affect plant circuitry and limit its life. In addition, modules are made of fragile componentry, such as glass, and can crack or break easily if mishandled. Given the strenuous nature of this work, as well as the competition for manual labor, labor costs are rising. As a result, the industry is experiencing labor shortages.

An Innovative Solution

Sarcos is developing technology that will not only enhance labor productivity and safety, but also reduce construction costs and accelerate the construction of solar fields by automating solar module installation tasks. Through a project with the Department of Energy, Sarcos is developing a new, outdoor, autonomous robotic system using state-of-the-art computer-vision and machine-learning techniques. The system aims to reduce the time it takes to construct a new solar field by almost 40 percent. Sarcos is applying its history of developing robotic systems for unstructured, outdoor environments to support the transfer, manipulation, and placement of solar modules. In addition, Sarcos will use its computer-vision and artificial intelligence software to ensure that the system is capable of autonomously manipulating and placing PV modules to safely and efficiently construct a solar field.

Why Implement an Autonomous Robotic System for Solar Field Construction?

- Improve worker safety
- Automate dangerous tasks
- Automate repetitive tasks
- Reduce construction time
- Address labor shortages
- Streamline operations
- Disrupt your industry

Technology Provider Checklist

As the solar energy and construction industries begin to navigate today's new technological revolution, companies are searching for trusted and experienced solutions providers. Before partnering with a technology provider, you'll want to ask the following questions:

✔ Is the technology partner experienced?

Sarcos has been developing outdoor robotic systems for decades. We are now applying the same technology we engineered for the U.S. military to commercial applications for the solar industry.

✔ Is the technology partner incorporating next-generation technology into its robotic systems?

Sarcos' robotic systems have expanded significantly beyond teleoperated robots and into the field of computer vision and machine learning, thus enabling our robots to see, feel, and interact with the world. Our perception software can detect and track objects in just about any indoor or outdoor environment, and our autonomy algorithms can handle anomalies that are common in unstructured, outdoor environments.

✔ Does the technology partner understand your industry's challenges?

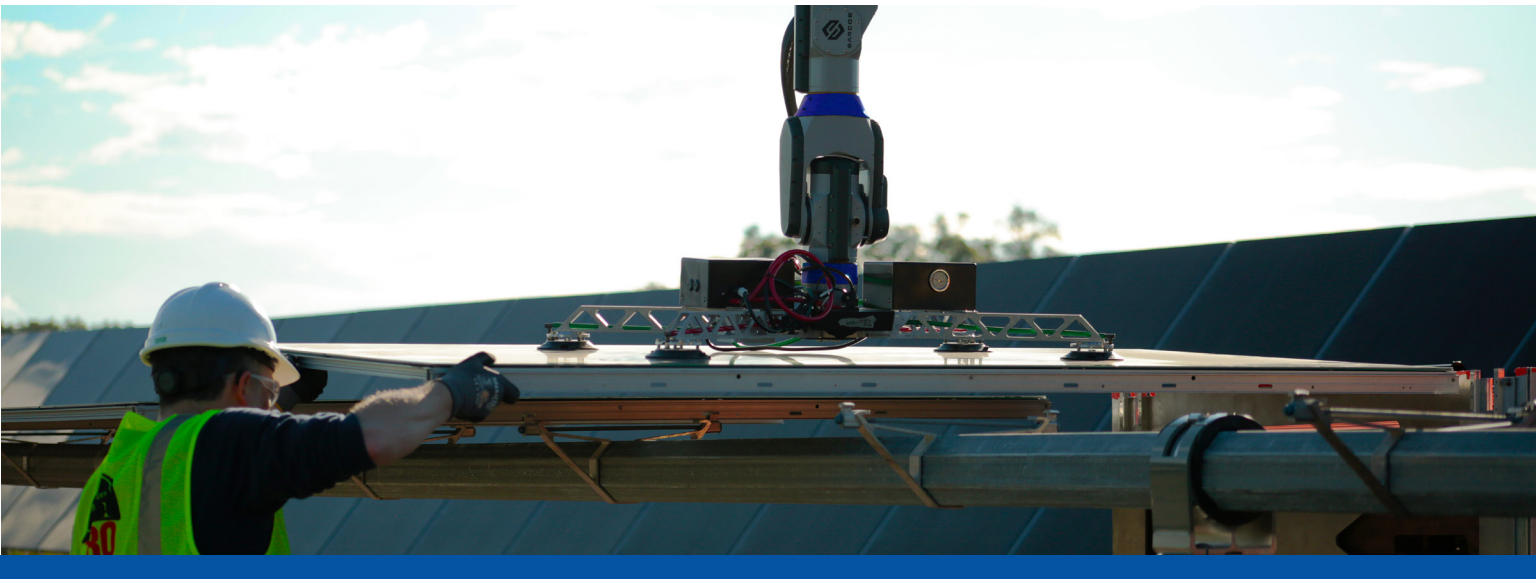
Sarcos was awarded $1.9 million in funding from the U.S. Department of Energy Solar Energy Technologies Office (SETO) to create technology that will improve access to solar energy. Our team is partnered with industry leaders who are aware of the industry's growth and challenges, and we are prepared to help your solar energy company disrupt the industry.

✔ Does the technology partner emphasize worker safety?

Since its founding, Sarcos has been dedicated to creating technology that prevents injury and saves lives by keeping people out of harm's way. As we make new advances in robotic technologies, we remain committed to that mission.

✔ Is the partner's technology customizable to your needs?

Sarcos understands that customer needs vary. Whether you're looking for a single- arm or dual-arm solution, teleoperated or autonomous operation, Guardian robotic arm systems can be customized to solve your company's unique challenges.



See how Sarcos Robotics can transform your workplace safety and efficiency.

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