

SMART NEWS

Scientists Use Dead Spiders as Claw Machines

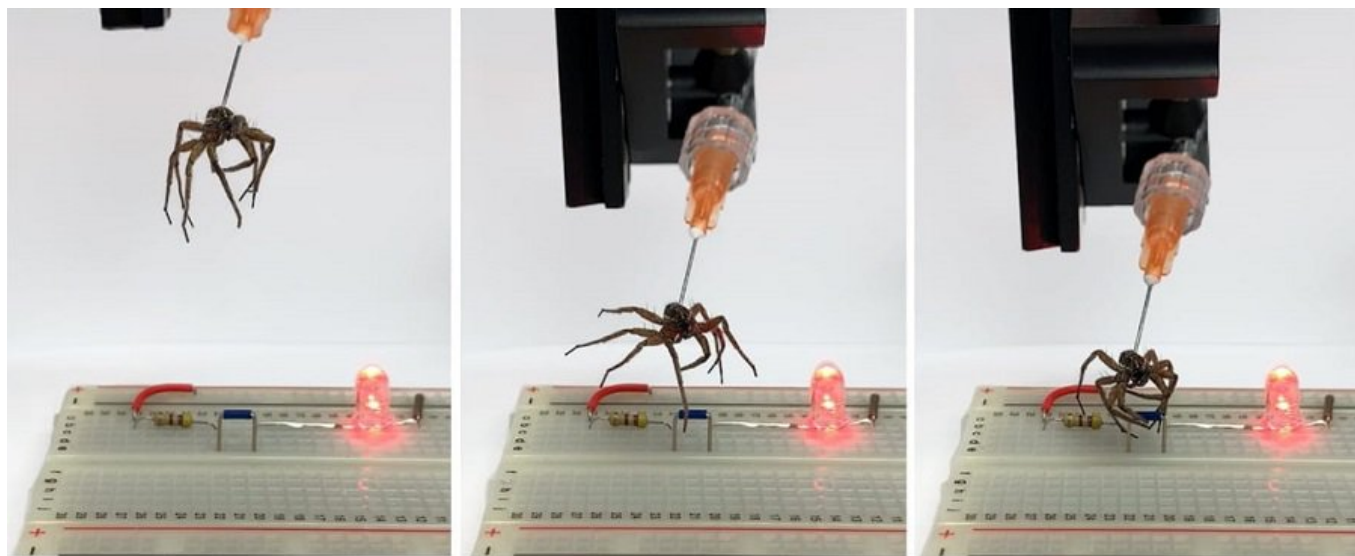
Researchers at Rice University have created “necrobotics,” a new area of research which uses biotic materials for robotic parts



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A spider gripper is used to lift a jumper and break a circuit on an electronic breadboard, turning off an LED. Preston Innovation Laboratory / Rice University

Spider corpses turned into robots sounds like the far-fetched plotline of a B horror movie. But researchers from Rice University have created just that—dead wolf spiders that can be used as machines to pick up and put down objects.

In a paper published in *Advanced Science*, researchers have dubbed the use of biotic materials as robotic components “necrobotics.” They say this area of

research could be used to create biodegradable grippers for very small objects.

“We understand that many people are put off by the sight of a spider, but from an engineering point of view, the spider’s mechanism of movement is very interesting,” Faye Yap, a mechanical engineer at Rice and lead author of the paper, tells Tony Ho Tran from *The Daily Beast*. “It definitely warrants taking a closer look at these creatures, and learning more from them.”

The research began in 2019, when the scientists noticed a dead spider curled up in their lab. Wondering why spiders always die with their legs in that position, Yap and her colleagues did a quick search and discovered that spiders have a hydraulic pressure system that controls their limbs.

“Spiders do not have antagonistic muscle pairs, like biceps and triceps in humans,” Yap explains in a university statement. “They only have flexor muscles, which allow their legs to curl in, and they extend them outward by hydraulic pressure. When they die, they lose the ability to actively pressurize their bodies. That’s why they curl up. At the time, we were thinking, ‘Oh, this is super interesting.’ We wanted to find a way to leverage this mechanism.”

To create their gripper, researchers stuck a needle into internal valves in the spiders’ hydraulic chamber, created a seal with superglue and attached a syringe to the other end. By puffing small amounts of air through the syringe, the scientists could extend and retract the spider's legs.

The dead spiders could pick up more than 130 percent of their own body weight and last through 1,000 open-close cycles, per the paper. Without any kind of coating on the corpse, the spiders only remained functional for two days because dehydration made their joints brittle. The researchers experimented with a beeswax coating and found it could slow loss of the spiders' mass.

The Rice team says necrobatic grippers could have multiple applications, including for the assembly of things like microelectronics and for collecting specimens.

“Because the necrobolic gripper has inherent compliance and camouflaging capabilities, we envision that we can deploy it in scientific fieldwork,” Yap tells *The Daily Beast*. “For example, to capture and collect small insects and other live specimens without damaging them.”

They say future research could include exploring different coatings for the spiders, experimenting with moving each leg individually and studying different species—like smaller spiders and whip scorpions.

And while the paper may conjure nightmare-inducing images of robot zombie spiders for some, coauthor Daniel Preston, a professor of mechanical engineering at Rice, clarifies that their research doesn’t actually qualify as reanimation.

“Despite looking like it might have come back to life, we’re certain that it’s inanimate,” Preston says in the statement. “It’s providing us with something really useful.”



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