

TECH

Like an octopus, this glove lets fingers grip slippery objects

The octopus-inspired suckers on each fingertip grab and release objects on demand



This octopus-inspired glove can latch onto objects having different shapes and materials.

PHOTO BY ALEX PARRISH FOR VIRGINIA TECH

By **Maria Temming**

July 25, 2022 at 6:30 am

For all its deftness, the human hand is not good at gripping slippery things. But a new glove could change that. Each of its fingertips is outfitted with a sucker inspired by those on the arms of an octopus. These suckers let the wearer grab slick objects underwater without having to squeeze tight.

“Being able to grasp things underwater could be good for search and rescue. It could be good for archaeology. [It also] could be good for marine biology,” says Michael Bartlett. He’s a mechanical engineer at Virginia Tech in Blacksburg. His team described the new glove online July 13 in *Science Advances*.

Each of the glove's suckers is a cone of rubber about as big as a raspberry. That cone is capped with a thin, stretchy rubber sheet. Pulling air out of the sucker draws its cap into a bowl shape that sticks to surfaces like a suction cup. Pumping air into the sucker inflates the cap. That causes the sucker to pop off surfaces.

Each finger also has a Tic Tac-sized sensor that detects nearby surfaces. When the sensor nears an object, it switches the sucker on that finger to sticky mode.

A new glove lets humans grip like an octopus | Scien...



The octopus-inspired suckers on a new wetsuit glove can comfortably pick up varied objects, from a metal toy car to a squishy hydrogel bead. Sensors on the glove activate suction at its fingertips whenever it approaches an object. This allows wearers to pick items up without even closing their hands.

Bartlett and his colleagues used the glove to pick up various objects underwater. The glove was able to latch onto a toy car, a spoon and a bowl. It could also snag a delicate, Jell-O-like bead of hydrogel. Each sucker, on its own, can lift about one kilogram (2.2 pounds) in the air. Underwater, it can hoist even more weight thanks to the help of buoyancy, Bartlett says. Adding more suckers could give the glove an even stronger grip.

This new glove barely brushes the surface of what octopuses can do. Those animals can individually control thousands of suckers across their eight arms. The cephalopods use those suckers to feel around the seafloor and snatch up prey. To do this, they don't just use tactile

sensors in their arms. Octopus suckers also are packed with chemical-sensing cells that [let the animals “taste” their surroundings](#).

The new glove is far from turning fingers into extra tongues. But Bartlett is intrigued by the idea of adding chemical sensors to the tech. With that upgrade, a future version of the glove could pick up objects made from only specially sought materials.

CITATIONS

Journal: S.T. Frey et al. [Octopus-inspired adhesive skins for intelligent and rapidly switchable underwater adhesion](#). *Science Advances*. Published online July 13, 2022. doi: 10.1126/sciadv.abq1905.