This 'octopus' robot arm can stick to almost any object

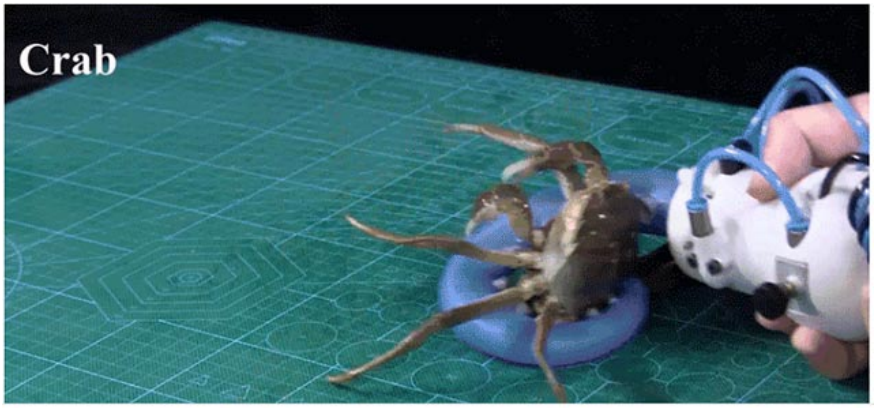
The robot arm is soft, skillful and extremely intelligent, able to identify and hold nearly every object in its power, with the shape inspired by the octopus tentacles.

Robot technology is being invested and developed on an unprecedented scale on a global scale in the past few years. Besides promoting the application of artificial intelligence, materials and design of robots are also the top concerns.

In particular, improving the grip of the robot is the most complex task. It requires the help of both artificial intelligence (to accurately identify the object) and the appropriate robot construction materials (to ensure the ability to adhere and not to damage the object). Last September, Nvidia sparked the technology world by introducing a new algorithm, called 6-Dof-GraspNet?, that allowed robots to distinguish and select arbitrary objects. 1 month later, OpenAI introduces Dactyl, a robot hand capable of learning how to solve complex Rubik's cube in a short time.

Today, an international interdisciplinary team of experts from Harvard University, the United States and Beihang University, China, has continued to stir technology enthusiasts by introducing soft robot arms, ingenious and extremely intelligent, able to identify and hold nearly every object in its power, with the shape inspired by the octopus tentacles.

The secret is a flexible, high-friction material used as a robotic arm, combined with simulated 'vacuum cups' with the octopus tentacles. This novel design allows the robot to hold, move and control countless objects of various shapes, as long as the size is not too large, from thin plastic sheets, coffee mugs, pipes. experience, eggs, even a live crab.



To create this amazing robotic arm, the researchers first carefully calculated the shape and mechanism of action of octopus tentacles in nature (these arms are a type of hydrostatic chamber muscles), then select the most optimal mechanism as well as the material is soft enough and has the ability to adhere like real tan skin, especially the indispensable 'suction cup' on the arm. These vacuum-based bio-suction tubes can attach to almost any object.

The operation of the robot arm is basically determined by the two valve systems. One valve creates pressure to bend the arm, while the other acts as a vacuum system that distributes force to the suction cups. Naturally, the amount of pressure and vacuum will be applied flexibly, allowing effective adhesion to certain types of objects.

The birth of this exciting robotic arm will provide new insights into the making of robotic actuators based on soft materials, paving the way for creating giant or ultra-small robotic arms, but extremely ingenious to perform the work of danger or high difficulty on behalf of people.