# Edinburgh researchers develop ant-inspired robotic gripper



Researchers at the University of Edinburgh have developed a prototype robotic gripper inspired by the unique mechanics of ant jaws, aiming to enhance robotic capabilities in object manipulation. This innovation, referred to as the “hairy gripper,” utilises a design that mimics the strategies ants employ to grasp items, which has yielded impressive results in testing.

The development of this two-jawed parallel plate gripper incorporates four rows of hairs made from thermoplastic polyurethane, arranged in a V-shape. This design has been specifically tailored to improve the gripper's performance in handling circular objects, which are often challenging for traditional robotic systems to manage. Testing of the prototype with typical household items, such as cups and jars, demonstrated a significant increase in its effectiveness—raising the grasp success rate from 64% to 90%.

The research, funded by the UK Research and Innovation Engineering and Physical Sciences Research Council (EPSRC), is poised to influence various sectors. Applications are anticipated across environmental clean-ups, retail, construction, agriculture, and other industries, as well as for home use.

Leading the research, Professor Barbara Webb from Edinburgh noted the aspiration to harness the intricate methods by which ants manipulate objects. She highlighted that, “Inspired by the strength and delicacy with which ants move things, our prototype is just the first step.” To create this gripper, the research team employed high-resolution videography to observe ants and track their detailed sequences of action as they pick up seeds and other objects—an area that has been relatively unexplored until now.

Professor Webb elaborated on the insights gained from observing the ants, particularly how their antennae and front legs interact with their jaws to improve dexterity in gripping and transporting items. This knowledge will be fundamental in guiding future enhancements to the robotic technology.

Professor Charlotte Deane, the executive chairwoman at EPSRC, praised the project, describing it as “a great example of cutting-edge engineering research leading to real-world benefits.” She acknowledged the gripper's potential to enhance productivity and efficiency across multiple sectors through its biomimetic approach.

Initiated in September 2021, the five-year project has secured a total funding of £1.7 million from EPSRC, indicating the research community's confidence in this innovative technology which bridges natural inspiration with robotic advancement.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://physicsworld.com/a/ants-hairy-jaws-help-robots-to-get-a-grip/> - This article supports the claim that researchers at the University of Edinburgh developed a 'hairy robotic gripper' inspired by the hairs on ants' jaws, which significantly improved the gripper's ability to grasp circular objects.
* <https://www.research.ed.ac.uk/files/439412186/SorourWebbArXiv2023AntGripBoostingParallelPlateGripper.pdf> - This PDF provides detailed insights into the design and testing of the 'AntGrip' robotic gripper, highlighting how mimicking ant mandibles enhances grasping performance.
* <https://www.independent.co.uk/tech/copying-ants-could-improve-grip-of-robots-research-suggests-b2724240.html> - This article corroborates the development of the 'hairy gripper' prototype and its potential applications across various sectors, including environmental cleanup and retail.
* <https://epsrc.ukri.org/> - This is the official website of the EPSRC, which supports the claim that the project received funding from the UK Research and Innovation Engineering and Physical Sciences Research Council.
* <https://www.ed.ac.uk/> - This is the official website of the University of Edinburgh, which supports the claim that the research was conducted by researchers based there.
* <https://www.ukri.org/> - This is the official website of UKRI, which supports the claim about UK Research and Innovation's involvement in funding the project through EPSRC.