

If it flies like a bird and perches like a bird ... then it's a robot

An EU-funded project is developing bird-inspired robots, complete with talons, that can fly and land on perches and small surfaces. A recent video showcases its inspiring achievements so far.





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People have often turned to nature for inspiration when tackling technological challenges. And what better way to solve a flying problem than to study nature's best flying machines? This is precisely what researchers from the University of Seville in Spain have done in their effort to build robots that can fly, land and perch just like real birds do.

The EU-funded project financing this work is rather aptly named GRIFFIN, after the

mythical creature with a lion's body and the head and wings of an eagle. GRIFFIN researchers are using different methods, tools and technologies to develop robotic birds that are capable of dexterous manipulation – meaning that they have talons to grasp objects and assist with landing and perching. "The robots will be able to fly minimizing energy consumption, to perch on curved surfaces and to perform dexterous manipulation," the <u>GRIFFIN project website</u> and to perform the genergy consumption of the maintaining fixed contact with a surface, such as a pole or a pipe, by means of one or more limbs and manipulating with others overcoming the limitations of dexterous manipulation in free flying of existing aerial manipulators," it goes on to explain.

Achievements over the past year

A recently released <u>video</u> showcases the Seville team's achievements. The accomplishments shown include a video game-style simulation of the robotic bird and testing of the robot's wings in a wind tunnel. They also include a demonstration of bio-inspired flexible wings that can carry out biofidelic flapping motions, or movements made by foldable wings that faithfully model the flapping of real birds. Also showcased in the video are robotic talons used for landing and perching.

The video shows two different types of robotic birds, the Powerbird and the E-Flap, in outdoor flight and autonomous indoor flight. Both birds are depicted flying across a room or field and landing on the ground or a perch using their talons.

The research team ultimately aims to build robotic birds that will be able to safely access areas that cannot be reached by rotorcraft and will also be capable of physically interacting with people. "Compliance will play an important role in these robots and in their flight and manipulation control methods," the project website states. "The control systems will be based on appropriate kinematic, dynamic and aerodynamic models. The GRIFFIN robots will have autonomous perception, reactivity and planning based on these models. They will be also able to associate with others to perform cooperative manipulation tasks."

The GRIFFIN (General compliant aerial Robotic manipulation system Integrating Fixed and Flapping wings to INcrease range and safety) project's future work involves integrating new and more advanced wing-flapping prototypes with perception and planning methods and autonomous perching and manipulation. The 5-year project ends in October 2023.

For more information, please see: <u>GRIFFIN project website</u>

Keywords

GRIFFIN, bird, robotic bird, robot, manipulation, land, perch

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