BIOMIMETICS

Soft robotics enters uncharted waters

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Credit: Joseph DelPreto, MIT CSAIL

Robots are of potential value in the study of marine life, where they could be used, for example, to examine the swim patterns of sea creatures. Current systems are of limited value, however, as they can be disruptive and cannot manoeuvre efficiently. Robert Katzschmann and colleagues at Massachusetts Institute of Technology have now developed a robotic fish that can swim in a biomimetic manner and observe aquatic life in the ocean.

The researchers built a robot termed a soft robotic fish, or SoFi, using 3D-printed soft actuators, which is complete with sensors, a video camera and a communication system. Unlike other robotic fish prototypes, SoFi can be steered from a

distance and also dive down to 18 metres. In particular, a diver can send commands to the robot remotely via acoustic signals, allowing its speed and motion to be controlled. In addition, the robot has a soft tail with hydraulic actuation and an autonomous buoyancy system that helps it imitate the movement of a real fish.

The team successfully tested the SoFi at a coral reef in Fiji. During six 40-minute dives the robot swam with other fish without scaring them away.

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