Robojelly: The Underwater Robot Jellyfish that Produces its own Energy from Hydrogen

Robojelly is the name of the newly invented underwater robot jellyfish prototype, capable of refuelling itself using hydrogen present in ocean waters, producing the necessary energy to perform its movements.

The system that allows the robot to move autonomously was developed and realized by Virginia Tech University after having closely observed the movements of real-life jellyfish, which are able to flex their tentacles by means of a propelling action in the muscles, controlled by the upper region of the organism, which contracts and expands in a way that makes it possible for these unique marine animals to move through water.

The jellyfish robot was realized using special materials, chosen for their flexible qualities, so as to imitate the harmonious real-life movements of these invertebrates in their course through the water. To obtain a satisfactory result, Yonas Tadesse and his colleagues used nickel-titanium parts to create tentacles that retain their original form after contraction. In addition, they constructed a covering made of metallic nano-particles, able to generate heat, thus producing energy, once exposed to the hydrogen and oxygen present in ocean waters.

Thanks to this exothermic reaction, the tentacles of the jellyfish robot are potentially able to contract and protract continuously because of the constant presence of hydrogen and oxygen in ocean waters. What this means for the robot's performance is that it does not need to resort to external energy sources or use fuel. The next step in research for this invention – a direct source of inspiration is the movement patterns of the jellyfish species, Aurelia aurita, or common jellyfish – is the creation of a system that makes it possible to control the direction of the robot's movements, an aim that, if realized, would make the device of potential use to highly relevant fields, such as the military and strategic operations.

Link

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