

Bio-inspired robots can mimic live fish

What is in news?

“A study has developed robots that imitate the movements of fish, in an attempt by scientists to better understand marine life.”

Developed by:

- ✓ Scientists at the New York University in the US have developed these robots

About it:

- ✓ Scientists have developed bio-inspired robots that ‘see’ and mimic the behaviour of live fish in real time, and may help improve our understanding of marine animals.
- ✓ Biomimetic robots have been deployed alongside live animals to better understand the drivers of animal behaviour, including social cues, fear, leadership, and even courtship.
- ✓ Researchers tapped advances in real-time tracking software and robotics to design and test the first closed-loop control system featuring a bio inspired robotic replica interacting in three dimensions with live zebra fish.
- ✓ The team tested the interaction of the robotic replica and live zebra fish under several different experimental conditions, but in all cases, the replica and the live fish were separated by a transparent panel.
- ✓ In preference tests, zebra fish showed greater affinity-and, importantly, no signs of anxiety or fear – toward a robotic replica that mirrored its own behaviour rather than a robot that followed a pre-set pattern of swimming.

- ✓ While mirroring is a basic, limited form of social interaction, these experiments are a powerful first step toward enriching the exchange between robots and live animals.
- ✓ This form of mirroring is a very simple social behaviour, in which the replica seeks only to stay as close as possible to the live animal.
- ✓ Scientists are now investigating social interactions among live zebrafish to better understand the animals' natural cues and responses.

Biomimicry is copying the nature while bio-inspired design is learning from nature and making a mechanism that is simpler and more effective than the system observed in nature.

- ✓ Biomimicry has led to the development of a different branch of robotics called soft robotics.

Prelims Question:

Q) Statements regarding the Biomimetic robots recently in news

1. These robots have been deployed alongside live animals to better understand the drivers of animal behaviour.
2. The first robot fish (MIT's RoboTuna) was designed to mimic the structure and dynamic properties of a Tuna.

Which of the above statements is/are correct?

- a. Only 1
- b. Only 2
- c. Both
- d. None of the above

Ans: c

Mains Question:

Q) Explain about the Bio-inspired robots to study the marine life behaviour.