INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY
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Technology, Social Impact

UNDERWATER CONTINUUM MANIPULATOR WITH GRIPPER

ABSTRACT

This project demonstrates the Bio-inspired Robotic Manipulator. This kind of Robotic Manipulator is inspired from Octopus Tentacles or Trunk of an Elephant. It is flexible and it has dual gripping and shrinking capacity.

OBJECTIVE

- We are developing an Underwater Continuum Robotic Manipulator to grasp various objects with Continuum Arm and Flexible Gripper.
- Also it is aimed to shrink around 30 % of its vertical length Fig2 (Sec 2).

METHOD

- Three Servo Motor based Tendons driven system have been used to actuate the entire Continuum Arm.
- Another Servo motor has been used to control the Gripper.
- Two types of springs have been used as the part of the system.
- By controlling the tendons we can achieve the grasping with Continuum arm & Gripper.

Fig 1: Octopus Tentacles

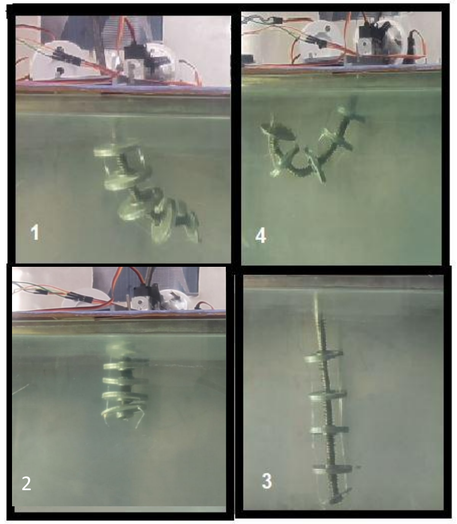

Fig 2: Stages of Manipulation

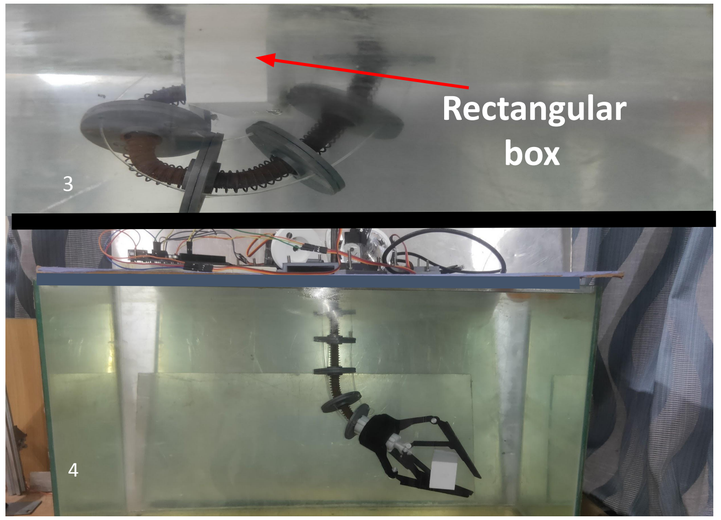

Fig 3&4 : Grasping object with Continuum arm & Gripper

Reference:

- Mishra, A.K., Del Dottore, E., Sadeghi, A., Mondini, A. and Mazzolai, B., 2017. SIMBA: Tendon-driven modular continuum arm with soft reconfigurable gripper. Frontiers in Robotics and AI, 4, p.4.
- Haihang Wang et al, Modeling and Experiments on the Swallowing and Disgorging Characteristics of an Underwater Continuum Manipulator, ICRA 20.

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