

Bio-Inspired Sub-carangiform Fishbot

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Abstract

Underwater robotics is a great option to carry out various underwater operations like environmental inspection, monitoring natural resources, defense operations, underwater machinery inspection and many more, remotely.

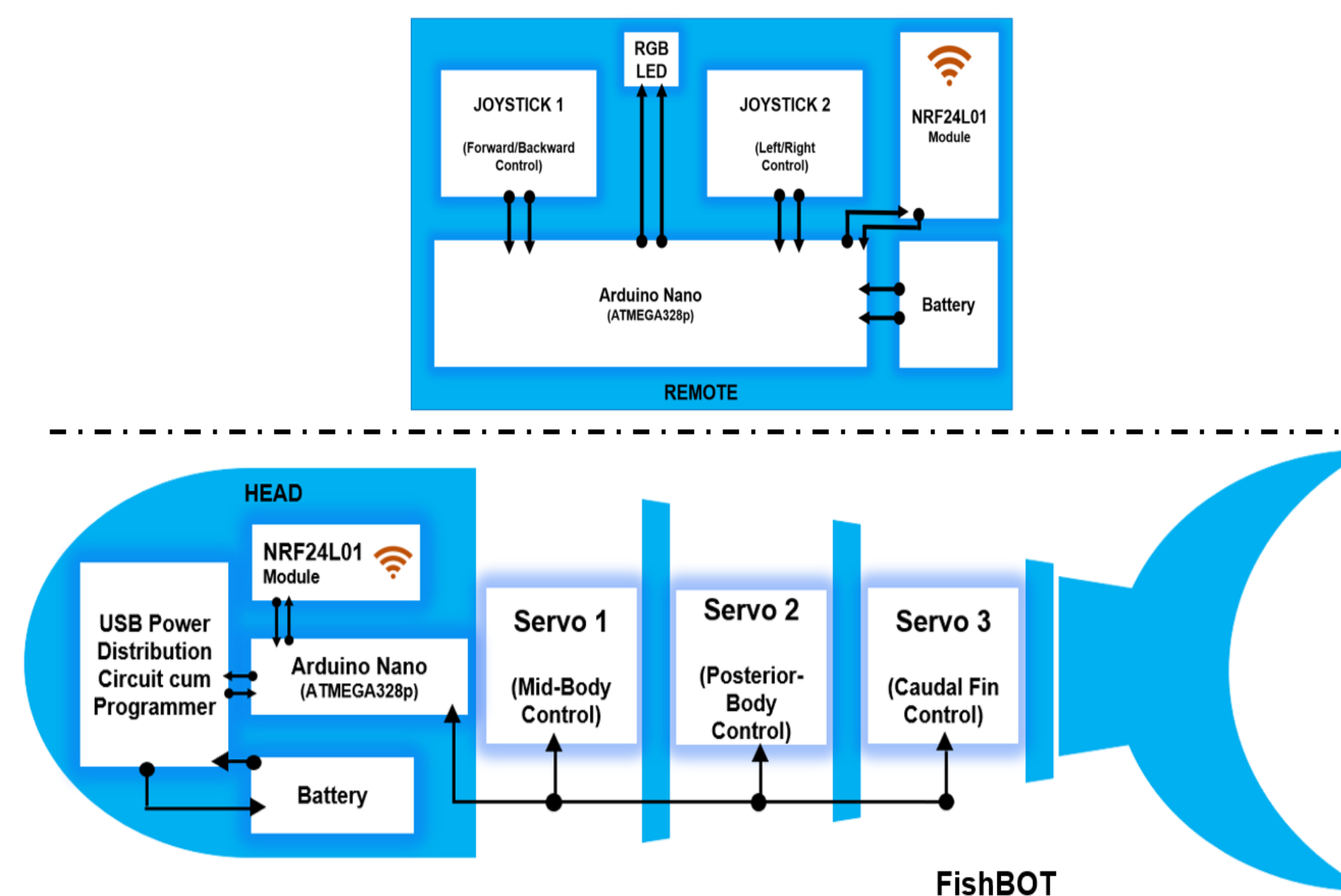
Objective

The objective of this project is to design, develop & build a bionic subcarangiform fish that can swim and can be controlled remotely.

Introduction

Nature has always remained an inspiration to build and innovate robots that operates similar to real-world beings. A fish has got typical smooth motion when it comes to underwater navigation. It uses undulated body motion and caudal fin to move forward and pectoral & pelvic fins for turning operations. This robo-fish has geometry and body resembling to a subcarangiform fish.

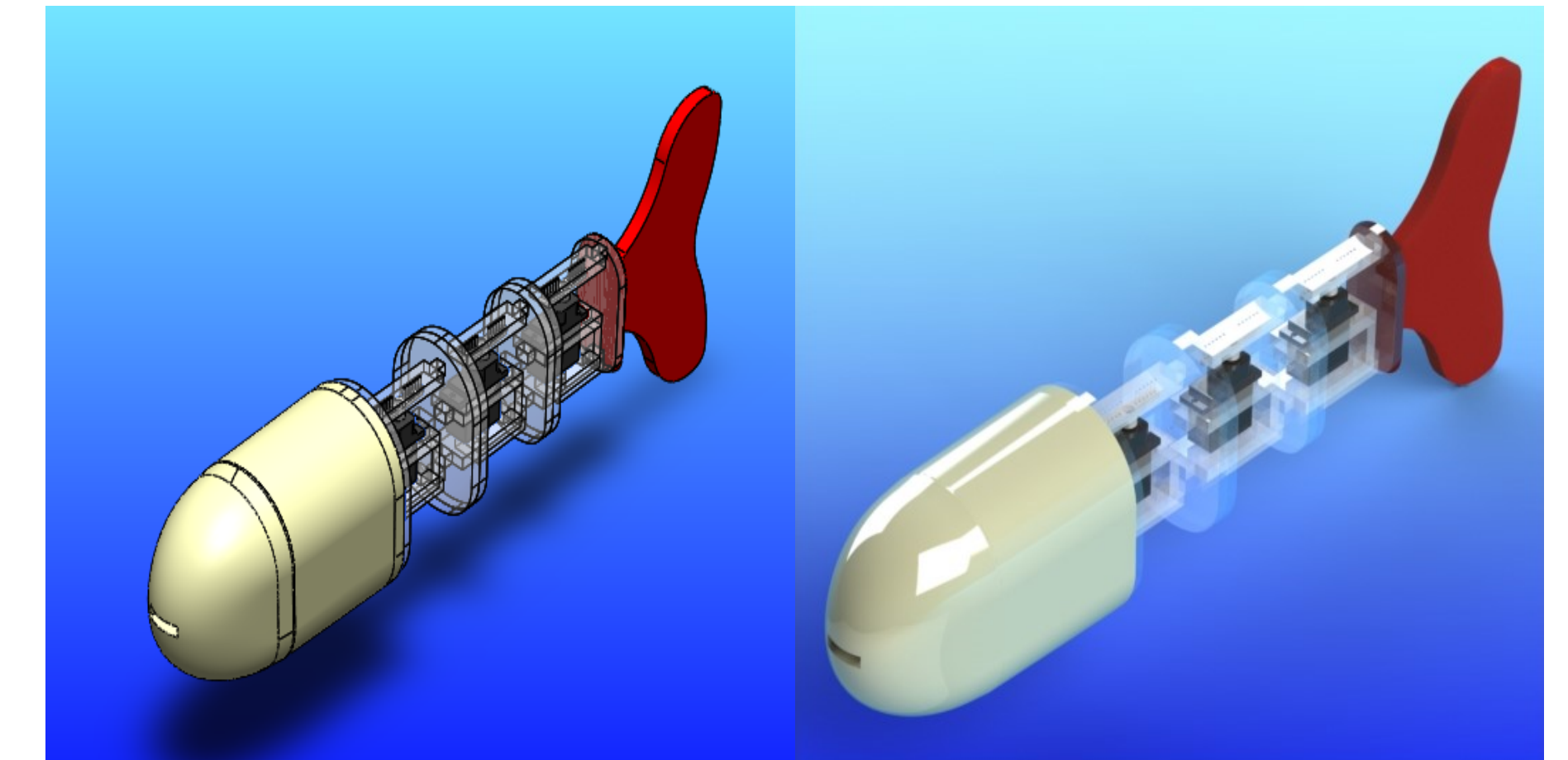
Block Diagram



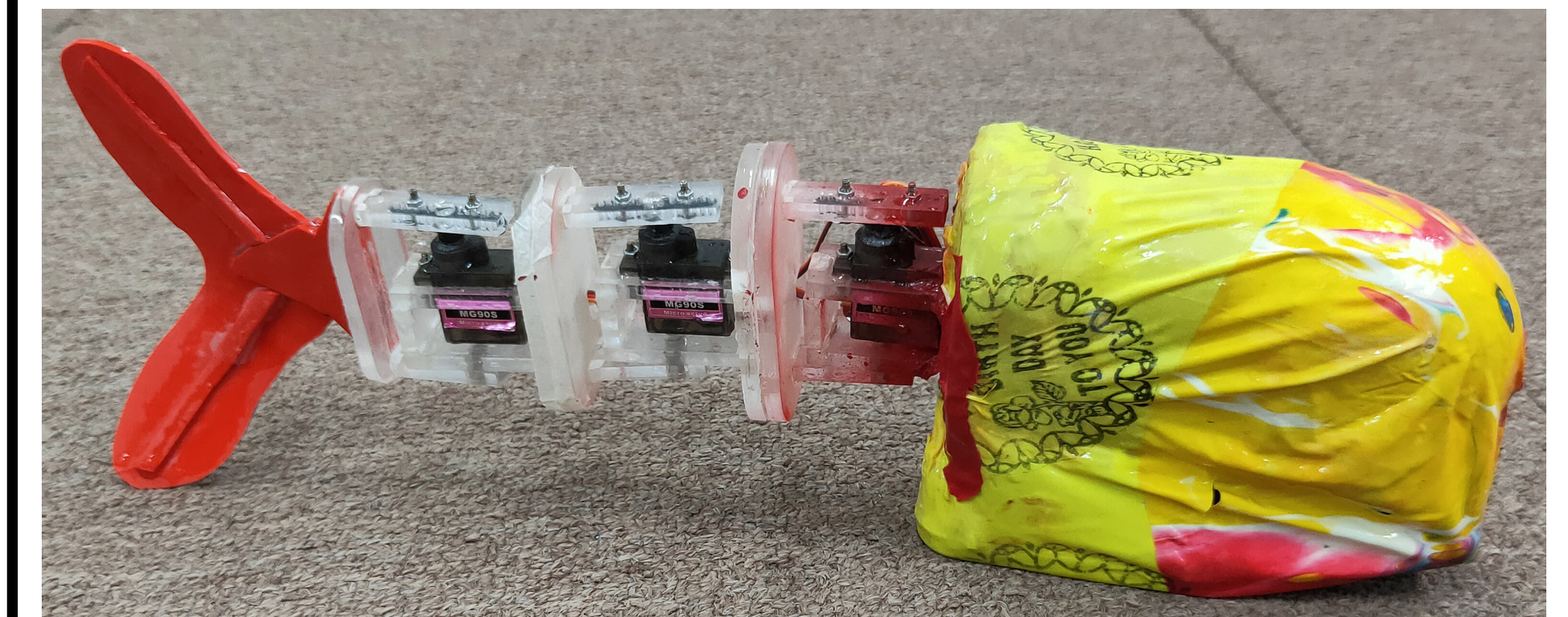
Features

- + Imitates swimming pattern of a sub-carangiform fish and has streamline design.
- + Multi-segmented body for a sinusoidal motion of the body. (Length is 36cm and Turning Radius is 18cm).
- + Maneuvring of the fish is achieved using only **Caudal Fin** and the **Body motion**.
- + Wirelessly controlled using NRF24L01 module (2.4 GHz ISM Band) through SPI protocol.
- + Waterproofing of electronics using plasticizer resin.

Solidworks CAD model



Actual Model



Application

- + Underwater surveillance.
- + Underwater exploration.
- + Robot-animal interaction.
- + Aquatic Environmental monitoring.
- + Education and outreach.