**Fish-bots to Conduct Controlled Experiments on Fish Behavior**

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Research
Title: Fish-bots to Conduct Controlled Experiments on Fish Behavior
Ms. Kalloo and Mr. Lynch worked as a team to design and build a wirelessly controlled robotic-fish for use in studies of fish/marine environments, and to inspire K-12 students to study robotics. Their system contained a smartphone application to control the movement of the fish, a router that facilitated wireless communication, an Arduino Uno with an Ethernet shield, and an RF communication system. They connected a radio transmitter to the Arduino to send signals to a radio receiver inside the robotic fish. They developed and implemented a software package containing the Arduino code for radio communication with the robot and Wi-Fi communication with the smartphone. The current version of the Fish App was developed for iPhone.
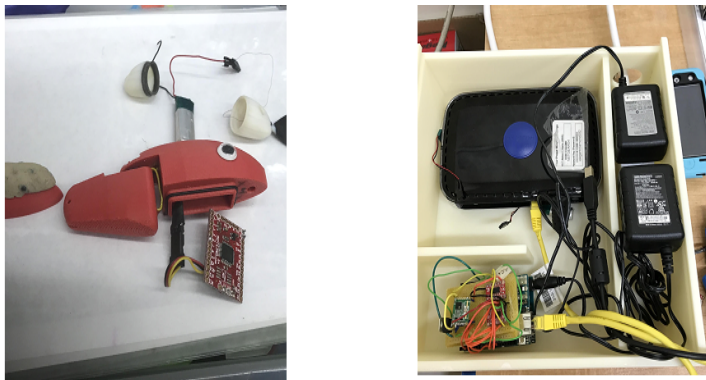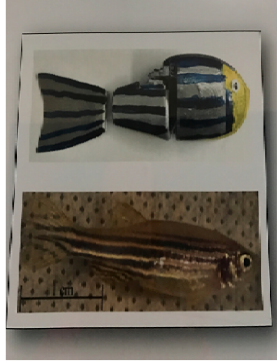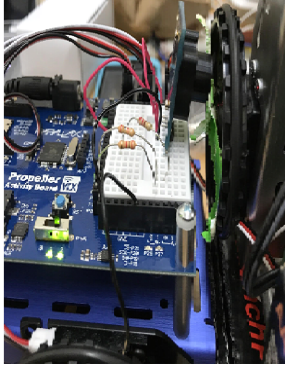

Figure: Hardware for the experiment
Lesson Plan
Title: Studying Evolutionary Development of Fish using Fishbots
This lesson is directly linked to research on robotic fish. The aim of the lesson is for students to explore the evolutionary development of fish (for example sharks) and the features that contribute to this evolutionary development. Students will print different 3D models of shark's fin tails and noses at different stages of their evolutionary development and use these to insert onto the attachable parts of a fish-bot. This will be used to compare the speeds using a distance-time graph of each shark at their evolutionary stage and by analyzing these results.

Figure: Hardware for the lesson