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A Biomimetic Underwater Actuator

-Categorization of fish using swimming behavior, and development of fin actuator using electro conductive polymer-

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Summary: Precise motion control without mechanical noises is a technical issue on the operations of research vessels and underwater vehicles in order to observe creatures in actual. As a solution for the problem, we pay attentions to bio-mechanisms of underwater creatures, especially undulately fins being used for attitude control. Bio-mechanisms of creatures are adapted to environment as a result of evolution. If the motor control mechanisms of the creatures can be introduced into underwater robots, there is a possibility to realize a high performance actuator. In this research, we have been trying to develop a bio-inspired underwater actuator instead of screw propellers. As the material of the actuator, electroconductive polymer is used as an artificial muscle. We describe the concept of the developing actuator, behavior of water creatures and development of electroconductive polymer and the results of performance evaluation test of the developing electro conductive polymer.

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