machines

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Special Issue Reprint

Bio-Inspired Smart Machines: Structure, Mechanisms and Applications

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By imitating certain characteristics of creatures in nature, such as grasp, twist, locomotion, or flying, etc., bio-inspired smart machines can engage in certain difficult tasks instead of human beings, such as medical surgery, rapid manufacture and assembly, disaster search and rescue, and scientific investigation, and this has become one of the most interesting areas in the robotics community. This reprint focuses on the latest theoretical and technological advances in bio-inspired smart machines and their structure, mechanisms, and applications. Generally, bio-inspired smart machines can be divided into two categories: rigid machines and soft machines. Rigid machines are composed of different rigid components assembled together, and the joints are mainly driven by electric motors or hydraulic means. In soft machines, the rigid hinges and bolts together with the body structure are replaced by soft components usually made from stimulus-responsive materials that change shape in response to stimuli. The whole reprint consists of eighteen research articles, which include state-of-the-art research on bio-inspired smart machines and their subsystems and components, such as bio-inspired rigid machines, soft machines and robotics, active materials, controls, sensors and actuators, structure and modeling, etc., and can provide a reference for researchers in related fields, including but not limited to robotics, intelligent control, intelligent sensing, etc.

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