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Locomotion Strategies for Amphibious Robots-A Review (Review) (Open Access)

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Abstract

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In the past two decades, unmanned amphibious robots have proven the most promising and efficient systems ranging from scientific, military, and commercial applications. The applications like monitoring, surveillance, reconnaissance, and military combat operations require platforms to maneuver on challenging, complex, rugged terrains and diverse environments. The recent technological advancements and development in aquatic robotics and mobile robotics have facilitated a more agile, robust, and efficient amphibious robots maneuvering in multiple environments and various terrain profiles. Amphibious robot locomotion inspired by nature, such as amphibians, offers augmented flexibility, improved adaptability, and higher mobility over terrestrial, aquatic, and aerial mediums. In this review, amphibious robots' locomotion mechanism designed and developed previously are consolidated, systematically The review also analyzes the literature on amphibious robot highlighting the limitations, open research areas, recent key development in this research field. Further development and contributions to amphibious robot locomotion, actuation, and control can be utilized to perform specific missions in sophisticated environments, where tasks are unsafe or hardly feasible for the divers or traditional aquatic and terrestrial robots. © 2013 IEEE.

Author keywords

amphibious robot autonomous amphibious vehicle Bioinspired robot multimodal locomotion

Indexed keywords

Engineering controlled terms: Antennas Military applications Robotics

Engineering uncontrolled terms: Amphibious robot Combat operations Commercial applications Locomotion mechanism Locomotion strategies Technological advancement Terrain profile Terrestrial robots

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