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Foot Type Amphibious Investigation Robot

足型水陸偵察機器人

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作品摘要 Abstract

本研究針對目前最熱門軍事與娛樂方面，設計出能替代人類至任何險惡地區進行探索任務的多足偵察機器人。在市面上常見的多足機器人如：蜘蛛機器人、昆蟲機器人等等，其足部構造大多需使用多軸馬達完成，但因其過於複雜的結構導致機器人的足部無法快速及準確的移動。本團隊所製作的足形偵察機器人，其機構只需六顆AI馬達，並使用特殊「C」型構造完成機器人足部的行動機構，機器人的行動原理，使用足型機器人行走模式，與輪型機器人的控制方式來完成，兼具足型機器人跨越能力，以及輪型機器人高速移動性，即使在崎嶇不平的道路上，機器人依然可以保持良好的穩定性以及高速突破性。機器人裝置多種感測元件如：紅外線感測器、超音波感測器、溫度感測器及無線攝影機等多種感測元件，進行各種環境的偵測，並可使用電腦操控機器人達到遠端偵察的功能，替代人類進行高危險性偵察活動。應用可結合在救災、核能廠偵測、特殊地形探索、科學偵查、軍事用途。

In the recent years, there are lots of myriapod robots such as spider robots, insect robots, etc. There are usually two or even more motors in each legs of a robot. Results in improving in precise positioning but slowly walking speed and expensive. That is the major issue of slowly developing of the multi-legged robot. We use only six AI motors in each legs reduce the complexity and cost of the robot. Each motors are connected to the "C" shaped legs which have good flexibility and toughness, and they are used to sustain the whole robot because of excellent effect in shock-absorbing and simple construction. When the robot needs to move forward, motors in left side do counterclockwise rotation and the other side is converse. But there are always only three legs contacts with the ground in the same time formed a special triangle pace. The robot presents good stability and fast in moving when crossing rough roads, and it can also crossing lawn, sandy beach, mire, stairs and inclined ramp. As reconnaissance robot, it installed many sensors such as infrared sensor, ultrasonic sensor, temperature sensor and wireless camera, and can explore a high-risk environment for humans such as cave, volcano, outer space and military areas.