

Locomotion generation of a new quadruped walking robot using an embedded control system : 新型四足步行機器人之運動

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ABSTRACT

In this paper a new quadruped robot is used to investigate the relation of the bio-mimetic behavior and walking pattern. The legs of the novel quadruped robot, distinct from traditional walking robots with jointed legs, are designed by rotational axles. Each leg are comprised of coxa, femur, tibia and toe, and actuated by two sets of gear trains. Thereafter, the kinematics will be investigated to verify the gravity center to be kept a level while walking. Moreover, a central pattern generator(CPG) is developed to generate the walking patterns for mimicking quadruped animals. The undetermined parameters of the CPG can be optimized by the learning automation modulation method such that the associated walking/running patterns is realized. Also, the bio-mimetic behavior is developed by the cooperative method to generate the associated walking patterns so that the relations of the CPG-based behavior and locomotion patterns are constructed. Finally, an embedded control system is used to implement the locomotion control, and verify our developed model for the CPG-based bio-mimetic behavior and locomotion patterns.

Keywords : quadruped robot、 generator(CPG)、 embedded control system

Table of Contents

中文摘要.....	iv	英文摘要.....	v	致謝.....	vi	目錄.....	vii	圖目錄.....	ix												
表目錄.....	xii	第一章 緒論	1	1.1 研究背景與動機.....	1	1.2 文獻回顧.....	1	1.3 研究流程.....	5	1.4 章節架構.....	7										
第二章 懸臂式四足機器人設計	8	2.1 機構設計.....	8	2.2 輸入角度關係.....	11	2.3 腿部機構轉動角度.....	13	2.3.1 小腿周轉齒輪之輸出角度.....	20	2.3.2 大腿與小腿之錯動關係.....	21	2.4 馬達介紹.....	22	2.5 八軸伺服機運動控制電路.....	23	2.6 控制系統架構.....	25				
第三章 懸臂式四足機器人步行運動	27	3.1 aPSOC Designer介紹.....	27	3.2 馬達旋轉參數值.....	28	3.3 馬達對四足機器人之動作.....	30	第四章 運動步態之產生	31	4.1 中央步態產生器.....	31	4.2 以中央步態產生器實現四足機器人之步態.....	32	4.3 步行運動之實現.....	32	4.4 身體前進速度.....	35	4.5 校正.....	36		
第五章 步行運動之實現	37	5.1 實驗架構.....	37	5.2 實驗方法.....	38	5.3 產生正確脈衝寬度變化為馬達伺服器之轉動角度.....	38	5.4 馬達伺服器之轉動角度探討.....	39	5.5 步態平衡.....	40	5.6 實驗結果.....	41	第六章 結論與未來展望	47	6.1 對於步態修改之探討.....	47	6.2 未來展望.....	47	參考文獻.....	49

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