곤충 모방 등반 로봇의 기구학

압둘 유마랸토[†](건국대) · 안재범[*](건국대) · 이상윤[**](건국대)

Kinematics of an Insect-Inspired Climbing Robot

Abdul A. Yumaryanto, Jaebum An, and Sangyoon Lee

Key Words: mobile robot (이동로봇), hexapod robot (육족로봇), robot kinematics (로봇 기구학)

Abstract : In this paper, we design a model of hexapod robot inspired by six-legged insects which able to climb multiple stairs. Legged robots are used to overcome limitations that wheeled ones have. The ability to climb and traverse an uneven terrain with a good stability in both static and dynamic situations is the main reason why we use six-legged insects as an inspiration of our kinematic design for leg robot. From the experiments using high-speed camera we analyze how the cockroach climbs multiple stair-like obstacles and how each leg of climbing cockroach has its own function. Our result is the design of a six-legged robot with two degrees of freedom in each leg, which enable the rotational and translational motion. To visualize and analyze how it can climb the stairs we also present a simulation using the ADAMS software.
f

HMA을 이용한 이족로봇의 이동물체 추적에 관한 연구

조동수[†](전남대 원) · 김동일[*](전남대 원) · 신윤덕[**](전남대 원) · 기창두[***](전남대)

A Study on Tracking of a Moving Target for a Biped Robot Using HMA

Dong Soo Cho, Dong Iel Kim, Yun De Shen, Chang Doo Kee

Key Words: Visual Tracking System(시각 추적 시스템), Biped Robot(이족 로봇), Hexagonal Matching Algorithm(육각형 정합 알고리즘), Affine Transform(어파인 변환), Kalman Filter(칼만 필터)

Abstract : In this paper, the visual tracking system for a moving target is proposed in the biped robot of which the movement of the camera is irregular. Hexagonal Matching Algorithm is used to measure the changes of size, location, and rotation angle for a moving object from its image frame. Also, for enhancing the efficiency of the tracking, we can adaptively adjust the starting point and the size of search area from the image information obtained. Finally, using Affine Transform and Kalman Filter, the position estimation of the moving target is refined against the swing of the camera. Experiments of the moving target tracking were implemented with 20-DOF biped robot using mono vision sensor to prove the reliability of the proposed method.