다중 장애물 환경에서의 이동 매니퓰레이터의 충돌 회피

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Collision Avoidance of A Mobile Manipulator Among Multiple Obstacles

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Key Words: collision avoidance(충돌 회피), mobile manipulator(이동 매니퓰레이터), elastic strip (탄성띠)

Abstract: This paper presents a method for collision avoidance of a mobile manipulator in multiple obstacles. The method deals with the problem of driving a mobile manipulator from a starting configuration to a goal configuration avoiding obstacles. The information on obstacle location and shape is assumed to be given in real time. The method repeats the following procedure until the robot reaches to its goal configuration: (1) initial trajectory planning and determination of way poses, (2) application of elastic field and repulsive potential field, (3) computation of joint torque and force, (4) modification of way poses, and (5) trajectory following. The method is tested in multiple robot cooperation task as well as in simulation.

Design of a Mobile Robot with Terrain-adaptive Mechanism for 3D Unstructured Environment

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부정형 지형에 적응하는 메커니즘을 적용한 이동로봇의 설계

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Key Words: mobile robot(이동로봇), terrain-adaptation(지형적응)

Abstract : Mobile robots for search and rescue in disaster area demand high mobility on the 3D unstructured environments. Such robots have mostly employed hybrid locomotion combining advantages of wheels, legs, and caterpillars. This paper will present the two-phase terrain-adaptive mechanism with hybrid locomotion. First, the novel wheels, which consist of spokes and connecting tracks, can overcome obstacles smaller than wheel diameter. In addition, passive suspensions, designed through modifying planar four-bar linkage, adapt larger obstacles. Moreover, the robot is expected to have intelligence to percept the 3D terrain through measuring the passive linkage adaptation and to stabilize itself by control the linkage configuration in the case of tip-over. The linkage mechanism has been evaluated through dynamic simulation.