

타이어와 지면간 마찰계수의 실시간 추정 알고리즘에 대한 연구

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Research for the real-time estimation of friction coefficient between tire and road

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Key Words: Tire(타이어), Friction Coefficient(마찰계수), Estimation(추정), Algorithm(알고리즘)

Abstract : If the real-time maximum traction force between the tire and the road can be precisely estimated, it would be easier to control the vehicle behavior. Usually, estimation of friction coefficient requires tire tread stiffness and tire contact length on road surface. But in this research, tire tread stiffness property and contact length are obtained from traction force and self-aligning moment. Using the estimation method introduced in this paper, only required parameters are lateral, longitudinal, vertical force, self-aligning moment and rotational speeds of all wheel. Isotropic tire brush model is used to obtain the equations of traction force and self-aligning moment. Validation of developed algorithm is performed based on real tire data, and the possibility of friction coefficient estimation is confirmed.

지능형 로봇팔씨름시스템의 개발

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Development of an Intelligent Robotic Arm-Wrestling System

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Key Words: Robotic arm wrestling(로봇팔씨름), force control(힘 제어), ultrasonic sensor(초음파센서), photoelectric sensor(광센서), random scenario(랜덤시나리오)

Abstract : In order to lessen social welfare cost and to improve the quality of life of the elderly via helping them physically and mentally, we have developed an intelligent robotic arm-wrestling system. This paper presents an intellectualization of the robotic arm wrestling system using ultrasonic and photoelectric sensors for detecting human approach and using an intelligent game scenario that reflects human will to win. The robot arm is controlled by torque command generation and torque control logic using information of the selected scenario, present velocity and position, and the previous torque command. The validity of the proposed logic and algorithm is shown through experimental study using the actual arm-wrestling system.