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# 강연제목: 근전도 신호를 활용한 관절 움직임 추정 연구 / Joint movement estimation using EMG signals

## Abstract:

This study was conducted with a focus on estimating joint movement using surface electromyography (sEMG) signals. Specifically, we developed a method for estimating joint angle and joint torque using sEMG, and studied a method for estimating joint torque that is robust to sensor position changes or experimenter changes. We made experiments when human joints moved using sEMG sensors and other kinetic sensors. EMG signals were analyzed to estimate joint angles and joint torques, which were verified through experiments. In addition, we proposed a method that is robust to changes in the sensor position of the experimenter or change of the experimenter. As a result, the proposed method was able to estimate joint torque with high accuracy even when the experimenter's position changed. Finally, dynamic torque estimation was also studied in this study. Dynamic torque is a particularly important part of joint motion, and it is very important to estimate the force of the actual muscle in action. We experimentally proposed a method for estimating dynamic torque using EMG, and this method showed high accuracy with static torque. In this study, in estimating joint motion using EMG, we proposed a robust method and dynamic torque estimation method even when the experimenter's position changes. These research results are expected to provide a new basis for research using EMG in the field of exercise rehabilitation or exercise physiology by increasing the practicality of using EMG sensors.

## Brief Biosketch

한남대학교 기계공학과 경슬기 교수는 한국과학기술원(KAIST) 기계공학과에서 학사(2014), 석사(2016), 박사(2022)학위를 취득하였으며, 연구 분야로는 웨어러블 로봇, 생체신호 처리, 생체신호 센서 개발, 생체역학을 포함하는 착용형 재활/보조 기기 개발이다.

Professor Kyeong of the Department of Mechanical Engineering at Hannam University received her B.S. , M.S. and Ph.D. degrees in 2014, 2016, 2022 from the Department of Mechanical Engineering at the Korea Advanced Institute of Science and Technology (KAIST). Her research fields include wearable robots, bio-signal processing, and bio-signal sensors development, development of wearable rehabilitation/assistive devices including biomechanics.