

## 적응제어 기법을 이용한 발목 근육 움직임의 안정적인 균형을 위한 모델링과 제어

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### Identification and Control of Ankle Muscles in the Stabilization of Balance in quiet Standing by using Adaptive Control

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**Key Words:** Adaptive Control(적응제어), System Identification(시스템 인식), Ankle Muscle(발목 근육)

**Abstract :** The purpose of this study is the identification and control of ankle muscles in the stabilization of balance in quiet standing. The study consist of system identification based on the data of measured COM(center of mass) during quiet standing, and control by using adaptive control method based on the model. The result shows that it is possible to control stiffness exactly with the optimum parameters that is gotten by system identification. Precise modeling is difficult because the structure of the ankle muscle is a non-linear and multi-variable system. But our model of stiffness control during quiet standing also suggests the possibility that the structure of the human body can be modeled by using advanced control method.

## 압전식 가스 밸브

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### Gas Valve using Piezo Actuator

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**Key Words:** PZT actuator(압전액추에이터), Gas valve(가스밸브), Bimorph actuator(바이모프 액추에이터), Proportional control(비례제어)

**Abstract :** Gas valve for domestic use is used for flow control of LPG(Liquefied Petroleum Gas) or LNG(Liquefied Natural Gas) of which pressure is about 200mmH<sub>2</sub>O( $\approx$ 0.0196 [bar]). Currently, two kinds of valves such as rotary type and button type are widely used in many applications. But, these valves have some problems that they are not controllable and reliable. Piezo actuation combined with modern microelectronics provides a reliable, quiet, low energy, infinitely adjustable gas valve. In this paper, gas valve using piezo actuator which are bimorph and a circle type was studied. Also, Prototype for gas valve was manufactured and characteristics of the prototype gas valve were analyzed.