

## عنوان مقاله:

Identification and control of Ionic Polymer–Metal Composite (IPMC) actuators

## محل انتشار:

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## خلاصه مقاله:

Ionic Polymer-Metal Composites (IPMCs) are a class of electroactive polymers (EAP) that are able to operate as distributed electromechanical actuators and sensors. These polymers show a great potential to be used as artificial muscle in robotic and in biomedical applications. In this paper, modeling and optimal control of IPMC actuators is studied. Due to the complexity of the governing equations, a nonlinear Hammerstein-Weiner model is used as IMPC model. This model consists of a linear dynamic submodel and two nonlinear memoryless blocks with some unknown parameters which are identified using the experimental results. Considering the identified model and using the inverse of the two nonlinear blocks, a Linear Quadratic Regulator (LQR) feedback controller is presented to control the position of IPMC actuator. Numerical simulations demonstrate a good position control performance of the IPMC actuator which is obtained by using the proposed controller.

## کلمات کلیدی:

Ionic Polymer, Metal Composite, LQR, Hammerstein-Weiner, System Identification

## لینک ثابت مقاله در پایگاه سیویلیکا:

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