

عنوان مقاله:

Design and Implementation of Macula Biosensor Simulator Based on Vibration in Viscoelastic Medium

محل انتشار:

دومین کنفرانس بین المللی آکوستیک و ارتعاشات (سال: 1391)

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خلاصه مقاله:

The macula of utricle, in internal ear, allows a person to perceive changes in longitudinal acceleration as well as effects of gravity. Three layers of macula are the sensory hair cells, a gelatinous layer and the calcium carbonate crystals which they arranged from bottom to top respectively. When the head is tilted such that gravity pulls on the calcium carbonate crystals, the gelatinous layer is pulled in the same direction also causing the sensory hairs to bend. In this paper a biosensor simulator based on macula of utricle operation of human's internal ear is presented. In this device the vibration of some bending elements implemented in viscoelastic medium is used to interpret the acceleration. External excitation leads to vibration of bending elements. Vibratory behaviours of bending elements are recorded via a CCD digital camera while an Image processing technique is used to obtain their motion behaviour. A fuzzy system is used to provide a relation between image interpreting results and known excitation acceleration. This device may be used in biomechanical studies of human response to variable conditions of environment. Also it will be used to provide the new devices to measurement of motion and balance adjusting

کلمات کلیدی:

Biosensor; Macula; Simulator

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