2축 열 대류 방식 가속도 센서의 설계

오준석† · 윤성기*(한국과학기술원)

A Study on the Parametric Design of Micromachined Dual Axis Convective Accelerometer

Jun-Seok Oh and Sung-Kie Youn

Key Words: Convective accelerometer(열 대류 가속도계), Thermal accelerometer(열 가속도계). Natural convection(자연 대류)

Abstract : A micromachined convective accelerometer is composed of a heating resistor and temperature detectors. Acceleration is detected by sensing changed temperature profile that is modified by natural convection. In this research, several design variables, distance of detector from heater, height of detector from substrate, frequency and heating power, are considered. Thermopile model is adopted for temperature detecting element. Based on numerical thermal transient analysis, parametric optimal design values are presented for better sensitivity and thermal time delay.

효율적인 multi-grid 유한요소법을 이용한 실시간 변형체 해석

전성기† · 최진복* · 조맹효**(서울대)

Efficient Multi-grid Haptic Simulation

Seongki Jun, Jinbok Choi and Maenghyo Cho

Key Words: s-FEM(s-FEM), haptic(햅틱), deformable object simulation(변형체 시뮬레이션)

Abstract : Accurate and fast haptic simulations of deformable objects are desired in many applications such as medical virtual reality. In the haptic interactions with a coarse model, the number of nodes near the haptic interaction region is too small to generate detailed deformation so that local refinement techniques have been developed. This paper presents a physics-based adaptive method to perform a haptic interaction with a deformable object which is analyzed by finite element method (FEM). It is accomplished by superimposing a local fine mesh upon a global coarse model which consists of the entire deformable object. The coupling between the local mesh and the global mesh is achieved by s-version finite element method (s-FEM) which is generally used to enhance more accurate solutions. The employment of s-FEM demonstrates the reliable deformation to users in real-time.