이름: 송 철/SONG, CHEOL
직위: 로봇 및 기계전자공학과/
Dept. Robotics &Mechatronics Engineering
소속: 대구경북과학기술원/DGIST
기타소속:

강연제목: 리사쥬 빔 스캐닝 내시현미경 영상 시스템

Lissajous beam scanning endomicroscopic imaging system

Abstract:

This talk introduces a Lissajous scanning confocal endomicroscopy system that utilizes a thin polyimide (PI) film, a piezoelectric tube actuator, and a modified approach to phase-offset-driven scanning. By employing finite element analysis (FEA) alongside experimental validation, the optimal dimensions for the PI film are determined, resulting in enough frequency separation and good field of view with low driving voltages. This system maintains a scanning density of over 80% at a high imaging speed, employing a modified method to correct any deviations in the scanning pattern. Furthermore, this talk also present an analytical model for asymmetric stiffeners using Castigliano's and Rayleigh-Ritz's methods, enabling swift adjustment of influential variables. Experimental imaging, including examinations of the rat gastrointestinal tract, confirms the effectiveness of the system, highlighting its potential for endomicroscopic applications.

Brief Biosketch

Cheol Song received a B.S. degree in mechanical engineering from Seogang University in 2003 (awarded Summa Cum Laude), and the M.S. and Ph.D. degree in mechanical engineering from KAIST in 2006 and 2010, respectively. From 2011 to 2013, he was a postdoctoral researcher with the Department of Electrical and Computer Engineering at Johns Hopkins University. He is an associate professor and vice department chair of Robotics and Mechatronics Engineering at Daegu Gyeongbuk Institute of Science and Technology (DGIST). His current research interests include intelligent bio-opto-mechatronics, artificial intelligence, biomedical imaging/sensing, and biomedical robotics.