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**기타소속:**

**강연제목:** Development of a high-sensitive optomechanical ultrasound sensor for photoacoustic microscopy: a feasibility study

### **Abstract:**

Ultrasound sensors are commonly used in medical imaging, industrial inspection, and non-destructive testing. Traditional sensors, which use piezoelectric transducers, have fixed sensitivity and dynamic range, leading to issues like signal saturation and high production costs. In this study, we introduce a new optomechanical ultrasound sensor that combines silicon photonic waveguides with a MEMS cantilever membrane. This sensor features tunable sensitivity and dynamic range, using light interference to detect mechanical vibrations caused by ultrasound. It is compact, cost-effective, and can be integrated onto a single chip. Our experiments showed that the new sensor has six times the sensitivity of traditional sensors, with a spatial resolution of 300 microns. It successfully imaged a USAF-1951 target and has potential for future biomedical applications.

### **Brief Biosketch**

Jaesok Yu (Member, IEEE) is an assistant professor of department of in Robotics and Mechatronics Engineering with Daegu Gyeongbuk Institute of Science & Technology (DGIST), Daegu, South Korea. He received B.S. and M.S. degrees in electronic engineering from Sogang University, South Korea in 2009 and 2011, respectively. He obtained his Ph.D. degree in bioengineering at University of Pittsburgh, Pittsburgh, PA, USA at the Multimodality Biomedical Ultrasound Imaging Lab, University of Pittsburgh Medical Center. He is a director of the advanced ultrasound research laboratory where are focusing on the development of novel ultrasound and optic fusion technologies for diagnostic imaging, molecular imaging and image guided therapy for preclinical and clinical applications.