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(국문/영문)기타소속:

**국문 강연제목: 지질학 최적화 기법을 활용한 치료 초음파 정밀
모니터링 시스템**

**영문 강연제목: Geophysics Optimization-Based Precision
Monitoring in Therapeutic Ultrasound**

Abstract(영문):

Ultrasound therapy uses cavitation, the rapid formation and collapse of microbubbles, to induce localized therapeutic effects. For treatment to be safe and effective, it is essential to know exactly where these bubbles occur, but current methods often lack precision, particularly along the axial direction and in cases with multiple overlapping events. To address this challenge, we adapted a double-difference method from geophysics and applied it to ultrasound signals. This approach defines a loss function by comparing pairs of bubble signals and incorporates it into an optimization process, enabling more accurate localization. Our framework, validated in phantoms and a tumor model, demonstrated higher precision and reliability than conventional methods, and supports improved imaging quality and localization accuracy for safer, more effective therapeutic ultrasound.

Brief Biosketch (간단한 이력, 연구/대외활동 소개,국문/영문)

현재 한국외국어대학교 글로벌캠퍼스 바이오메디컬공학과 조교수로 재직 중이며, 포항공과대학교 기계공학과에서 학사(2015)와 박사(2021)를 취득하였다. 이후, 한국과학기술연구원 바이오닉스연구센터(2021-2022)와 미국 스탠퍼드 의과대학 영상의학과의 박사후연구원을 거쳤다. 주요 연구 분야는 진단 및 치료 초음파, 인공지능 기반 의료영상, 음향 및 열유체 역학이며, 초음파 영상과 치료 기술의 정밀도 향상 및 임상 적용 가능성 확대를 목표로 연구하고 있다.

Jun Hong Park is an Assistant Professor of Biomedical Engineering at Hankuk University of Foreign Studies. He earned his B.S. and Ph.D. in Mechanical Engineering from POSTECH and completed postdoctoral training at KIST and Stanford University. His research focuses on diagnostic and therapeutic ultrasound, AI-based biomedical imaging, and acoustics/thermo-fluid mechanics.