



이름: 황재윤 / Jae Youn Hwang

직위: 교수 / Professor

소속: 디지스트 / DGIST

국문 강연제목: 탈부착 다중 소자 내시경 초음파 프로브를 이용한 딥러닝 기반 고해상도  
심부 조직 영상 기술

영문 강연제목: Deep Learning-based In-Depth High-Resolution Imaging using an  
Attachable Dual-element Endoscopic Ultrasound Probe

#### Abstract

Endoscopic ultrasound (EUS) faces a resolution vs. penetration depth trade-off when imaging human organs in vivo. To address this, we introduce a novel deep learning-based high-resolution EUS probe, accommodating both low- and high-frequency ultrasound image pairs. Our system includes a dual-element EUS probe with customized transducers for maintaining the same imaging plane within hardware constraints. We validate our system using wire and tissue-mimicking phantoms, yielding 442 ultrasound image pairs. By applying various deep learning models, we successfully generate synthetic high-resolution in-depth images, highlighting the clinical potential of our approach. Our quantitative and qualitative analyses identify an optimal deep-learning model for the task, demonstrating the potential of our deep learning-based dual-element EUS probe in delivering high-frequency ultrasound images deep within tissues.

#### Brief Biosketch

I hold a B.S. degree from Korea University and an M.S. degree from Seoul National University. In 2009, I obtained my Ph.D. degree from the Department of Biomedical Engineering at USC. Currently, I am a Professor at the Department of Electrical Engineering/Computer Science and Artificial Intelligence at DGIST.