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Professional Experience

Hanyang University

*Associate Professor,
Department of Biomedical Engineering*

Seoul, Korea
2018 – Present

University of Ulsan

*Associate Professor,
Department of Biomedical Engineering*

Ulsan, Korea
2011 – 2018

Medtronic Inc.

Senior MRI Scientist at Cardiac Rhythm Disease Management (CRDM)

Mounds View, MN, USA
2010 – 2011

- MRI compatible implants development team
 - * Design electric field –free DBS / pacemaker leads in clinical MRI (1.5 & 3 T)
 - * Evaluate temperature changes of a DBS / pacemaker lead due to MRI electric field heating

University of Minnesota

Post-Doctoral Associate at Center for Magnetic Resonance Research (CMRR)

Minneapolis, MN, USA

2009 – 2010

- Hardware development team for high resolution brain imaging in magnetic MRI systems (Advisor: Dr. Tommy Vaughan)
 - * Design novel RF (Radio Frequency) antenna system for the brain in high field MRI (~450 MHz)
 - * B_1 shimming with brain SAR (specific absorption rate) reduction in high field MRI
 - * Fast numerical brain imaging solutions (FEM+MoM) for high field MRI

University of Minnesota

Research/Teaching Assistant in Electrical and Computer Engineering

Minneapolis, MN, USA

2004 – 2009

- New numerical theory to analyze the open waveguides
 - * Developed the vector finite-element method (FEM) and boundary integral equation method
 - * Applied high performance coding technique to solve Maxwell equations
- Scattering of high dielectric objects for fast brain imaging analysis
 - * Method of moments with RWG (Rao Wilton Glisson) basis functions
 - * Analyzed high dielectric cube scattering
 - * Develop high efficiency brain antenna using Metamaterial based on high dielectric materials
- RF B_1 field localization for human brain in high magnetic field MRI systems
 - * Convex optimization for high resolution brain imaging
 - * Localized RF B_1 field in phantom and human brain model
 - * Operated the 9.4T MR system with a multichannel brain coil.

Education

University of Minnesota

Ph.D. in Electrical and Computer Engineering

Minneapolis, MN, USA

Sep. 2004 - Nov. 2009

- Dissertation: "Electromagnetics of waveguides, scattering, and MRI systems"
- Advisor: Dr. Anand Gopinath (IEEE, Life Fellow)
- Co-advisor: Dr. Tommy Vaughan (Center for Magnetic Resonance Research)

University of Minnesota

M.S. in Electrical and Computer Engineering

Minneapolis, MN, USA

Sep. 2004 - Apr. 2006

- Project: "Low Noise Amplifier using ATF34143 (pHEMT)"

Kyungpook National University

B.S. in Electrical and Computer Engineering,

Daegu, South Korea
Mar.1996 - Feb.2003