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강연제목: MRI 를 위한 하드웨어 영상시스템 개발 / Medical imaging system for MRI

Abstract:

MRI is based on nuclear magnetic resonance that was originally discovered by Bloch and Purcell in 1946. The present form of the MRI was introduced in the early 1970s by Lauterbur. He proposed the use of gradients to distinguish between spatially localized signals. This technique, which can encode spatial information, led to the development of MRI as a medical device. In the mid 1970's, Richard Ernst applied a 2D Fourier transform to the reconstruction of MR images. This method is a representative algorithm that is now used for MRI.

MRI is used in the clinic to diagnose and discover anatomical structures and physiological principles. The advantage of MRI is that it is a non-invasive imaging technique and therefore has an important role as a medical instrument. Unlike some other imaging modalities like x-rays and CTs, MRI does not require that the subject be exposed to ionizing radiation. MRI also provides more information than other imaging modalities with sensitive soft tissue contrast.

RF coils are essential hardware components of MRI. The role of RF coils is to transmit and receive signals between the MRI system and the subject being imaged. To obtain high quality images, a uniform B_1 field and a high SNR are highly desired with RF coils. Specifically for transmitter coils, a uniform B_1^+ field with a high B_1^+ efficiency is strongly preferred for uniform imaging. For receiver coils, a high SNR with a high sensitivity is essential for efficiently acquiring the RF signal. In addition, the issue of the safety of RF coils must be considered in the design of RF coils.

Brief Biosketch

- 차세대 통신 RF 설계 센터 참여교수
- iMRI 학술지 편집위원
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