## Lehrstuhl für Bildverarbeitung

# **Master/- Bachelor Thesis**

Development and Implementation of a Low-Field NMR Probe to acquire the free induction decay signal of a sample

#### Keywords

Low-Field NMR | Electrical Engineering | Data | Embedded Systems

#### Background

Magnetic resonance imaging (MRI) is an imaging technique that uses magnetic fields and radio waves to create detailed images of the inside of the body. Low-field MRI systems work with a weaker magnetic field. In the DeLoRi project, together with the Fraunhofer MEVIS Institute, we are developing a low-field MRI device to support cancer diagnostics. The first step is to develop a small nuclear magnetic resonance (NMR) probe that provides the basis for MRI imaging.



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### Tasks

In this thesis, a simple Low-Field 50mT NMR Probe (Coil, RF-Chain) and a simple electrical Interface will be developed, to measure the free induction decay of a water sample probe. This work can be adapted to your interests and ideas. On the one hand there is the possibility of the development of the RF-Coil structure, RF-Chain for driving the Coils or the signal acquisition in software or hardware. A further step can also be the design of the interface to the readout computer.

### Your Profile

For the successful implementation of the project, you should have an interest in one or more of the following subject areas:

- Electrical Engineering
- RF Electronics 0-10Mhz
- Embedded Systems

### Our Offer

The call for applications is aimed at master's students with a technical background

(e.g. electrical engineering or technical computer science) and is carried out in cooperation with Fraunhofer MEVIS. A workstation can be provided at the Chair of Image Processing, includes modern IT infrastructure, includes access to modern IT infrastructure, a workshop and rapid prototyping facilities.