MP/BME 710 Homework #4 – T1 and T2 mapping
Due: Thursday, Oct.25th, 2018

This homework is based on phantom data acquired on the Varian scanner with various sequences. You will find a zip file 'MP710_Lab_Handout.zip' with all necessary files on the course homepage. Look for the file 'MP710_MRI_Lab.m' and follow the instructions in this file. It is a 'skeleton' M-file that contains homework questions and some basic code, e.g. for loading the Varian data.

The goal of the assignment is to read in raw k-space data, reconstruct magnitude images, then measure T1 and T2 by fitting these images to a mathematical model of the MRI signal evolution.

There are three problems:
        0 is just an example
        1 deals with T1 mapping (IR sequence)
        2 deals with T2 mapping (SE sequence)

The key exercises in the homework are T1 and T2 fitting. In my opinion, Problem 2d) is easier to solve than 1d) (hint: it requires nonlinear fitting). If you get stuck at problem 1d), I suggest you move on to solving problem 2 and then revisit 1d.

Please also look at a file named 'notes for homework 4.pdf' which I included in the package. It contains some notes on how to setup an optimization / parametrization problem such as the T1 and T2 mapping exercises and Matlab functions and notation.

Please upload your homework solutions through the class website.