

Topics for student assistants

Project description #1:

Often commercial software as COMSOL or CST studio is used to solve Partial Differential Equations (PDE).

We develop an open-source workflow based on SALOME, GMSH and FeniCS as a free alternative. On the right you can see the electric field in a cell culture well (Petri dish), computed by our workflow and visualized by ParaView.

In the context of the software development there arise always topics for student assistants.

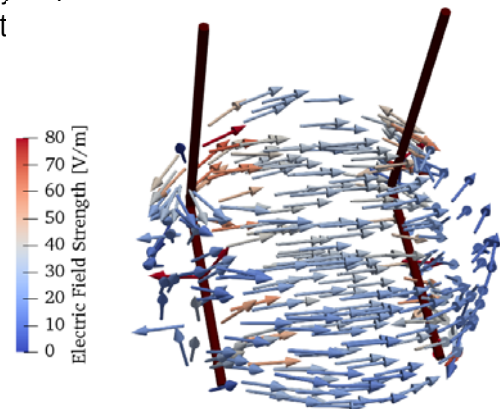
This includes development of models, examples or paramet

Please don't hesitate to contact me for further details!

Requirements:

Sound knowledge of C/C++ or Python.

First experiences with UNIX-like systems.



Project description #2:

We would like to use experimental data for the validation of our simulations as well as input for Uncertainty Quantification (UQ) approaches.

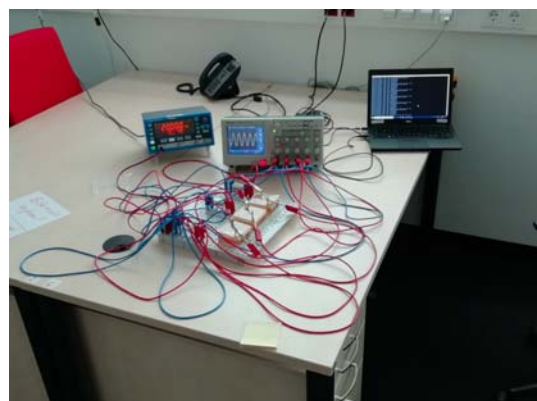
The experiments are conducted together with medical scientists and technical staff without knowledge of electrics. Thus, we need to design foolproof solutions.

Among the required solutions are:

- Continuous monitoring of AC signals (20 HZ, about 2V amplitude) and the current through the system using a shunt resistor as small as possible. I thought about developing a solution using an Arduino. If you are interested, I can show you first sketches of the circuit.
- Controlling the AC signal.
The mentioned signal fluctuates over time and leads to a different current. We want a solution where we can fix the current to a certain value.
This is the follow-up project to the monitoring project.

Requirements:

Soldering, willing to play around, first experiences with Arduino or microcontrollers



Current solution (very messy, you see why I need some support)