

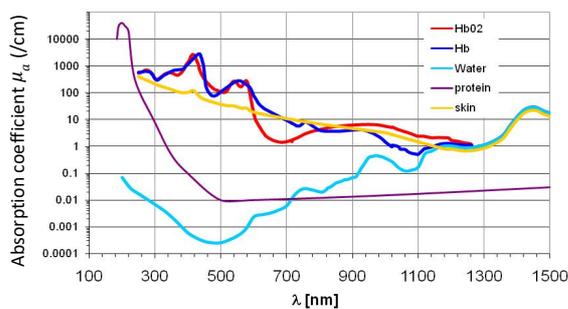
Spatial Frequency Domain Imaging

Determining the optical properties of your skin with your setup

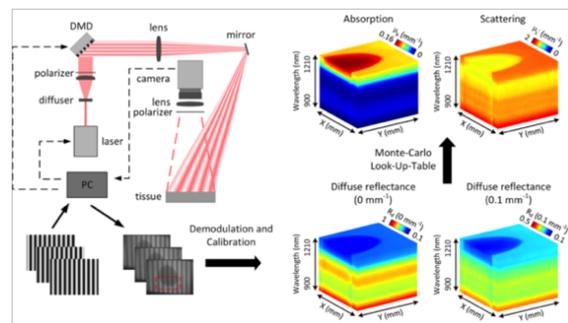
An internship position is available at the Biomedical Engineering and Physics department of the Academic Medical Center (AMC). In our group, new treatment and diagnostic procedures based on innovative physical techniques are developed. Research is performed by a multidisciplinary team that includes physicists, engineers, mathematicians, medical doctors, biologists, and chemists.

Background

The optical properties of tissues are determined by the concentration and distribution of the constituents, such as blood, lipids and water. The (health) status of the tissue correlates with these concentrations and thus the optical properties of the tissue (e.g. μ_a , μ_s , μ_s' , g , ...) can be used to monitor the status of the tissue. Determining these optical properties, however, is challenging as it is a combination of smart experimental measurements and appropriate modelling of the light-tissue interaction.



The absorption spectrum of tissue



SFDI principle (from <http://www.bu.edu/botlab/research/>)

Research description

In this project you will:

1. Built a new set-up to determine the optical properties of tissue, based on Spatial Frequency Domain Imaging;
2. Implement the algorithm to determine the μ_a , μ_s' of the tissue;
3. Validate your set-up and algorithm on samples with known optical properties;
4. Determine the blood, lipid, and water content of your skin (and other tissues).

Requirements

We are looking for a Bachelor/Master student with knowledge of physics and engineering. Biological knowledge is NOT needed. The duration of the internship can be adjusted according to the curriculum.

Learning outcome

The student will gain knowledge in the field of biomedical optics and develop skills in building set-ups, understanding models to describe light-tissue interaction and apply these models to analyze the data. Being part of an interdisciplinary and international research group the student will acquire competences including: (1) collaboration, (2) scientific writing, and (3) presentations.

References

1. <http://opensfdi.org>

Contact

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