Laboratory for Movement Analysis
University of Basel Children's Hospital (UKBB)
Spitalstrasse 33, CH-4056 Basel, Switzerland

Master Thesis 2020/2021

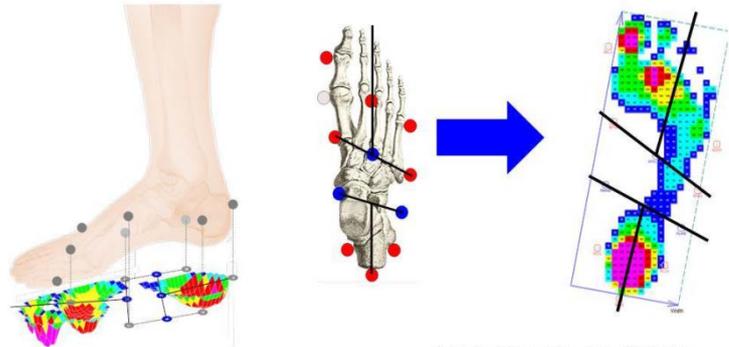# Integrating foot kinematics and plantar pressure for gait analysis

Keywords: Gait Analysis, Pedobarography, Foot kinematics

Overview

Plantar pressure measurements (pedobarography) and multi-segmental foot kinematics can be used in gait analysis to obtain insight into the biomechanics of the foot-floor interaction. Few studies have addressed the association between intersegmental kinematics and plantar loading within specific foot regions during gait.
At the Laboratory for Movement Analysis of the University of Basel

Adapted from: Dr. Julie Stebbins
Oxford University Hospitals NHS, UK

Children's Hospital we use both methods to gain inside into pathological foot biomechanics during gait. Currently a link is missing between plantar pressure data and data of patient specific foot kinematics. Interpretation of plantar pressure data alone is often difficult in pathological deformed feet. Thus, the main goal of this thesis is to develop a routine to link the information of both measurements and integrate it into our existing clinical and research methods.

Tasks

Your task is to develop a link between plantar pressure and foot kinematic data. When you are familiarised with both measurement techniques, you develop a concept how both datasets can be linked together. After you programmed a routine, you test your concept in the gait laboratory and analyse the resulting data. You summarise your results in a written report (Master thesis) and present it to the laboratory group.

Workpackages

- Literature research on the topics pedobarography and foot kinematics in gait analysis
- Familiarisation with the measurement techniques in the UKBB movement analysis lab
- Synchronise and link the plantar pressure and foot kinematic data by developing programming routines (MATLAB)
- Test your routine (retrospective data or prospective data depending on time)

Skills

- Some previous experience and basic programming skills, preferably with MATLAB

Contact

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