# Tasks for project „Clothing artefact removal“

* Step 0: Get familiar with the provided Python code (check out the readme file first; instructions and code are tested under Ubuntu 18.04 LTS)
* Step 1a: Compute/visualize the global segment orientation errors for the following segments (time plots for each movement, statistics (root mean squared errors/mean absolute errors, standard deviations for each movement and person)) 🡪 see figure below for segment names
  + Head
  + Right / Left Upper Arm
  + Right / Left Forearm
  + Right / Left Hand 🡪 only tightly fixed IMUs 🡪 errors should be low
  + T8
  + Pelvis
  + Right / Left Upper Leg
  + Right / Left Lower Leg
  + Right / Left Foot 🡪 only tightly fixed IMUs 🡪 errors should be low
* Step 1b: Compute the joint orientation errors for:
  + Head wrt. T8 🡪 neck
  + Right / Left Upper Arm wrt. T8 🡪 glenohumeral joints
  + Right / Left Upper Arm wrt. Right / Left Forearm 🡪 elbows
  + Right / Left Forearm wrt. Right / Left Hand 🡪 wrists
  + T8 wrt. Pelvis
  + Pelvis wrt. Right / Left Upper Legs 🡪 hips
  + Right / Left Upper Legs wrt. Right / Left Lower Legs 🡪 knees
  + Right / Left Lower Legs wrt. Right / Left Foot 🡪 ankles
* Step 1c: Identify the most challenging movements
* 🡪 document your results, e.g. gather plots, statistics, conclusions in a PPT
* Latest here, make an appointment with Bertram Taetz ([taetz@cs.uni-kl.de](mailto:taetz@cs.uni-kl.de)) and Gabriele Bleser ([bleser@cs.uni-kl.de](mailto:bleser@cs.uni-kl.de)) to discuss the results and how to proceed
* Step 2: error correction
  + Analysis of variances: check, which segments influence errors in which other segments
  + Use sequence to sequence mapping to remove artefacts (based on kinematic data)
  + Introductory tutorial for sequence to sequence learning: <https://github.com/ematvey/tensorflow-seq2seq-tutorials>
  + More advanced tutorials (optional):
    - <https://towardsdatascience.com/sequence-to-sequence-tutorial-4fde3ee798d8>
    - <https://github.com/sachinruk/deepschool.io/blob/master/DL-Keras_Tensorflow/Lesson%2019%20-%20Seq2Seq%20-%20Date%20translator%20-%20Solutions%20-%20bLSTM.ipynb>
    - <https://github.com/tensorflow/tensorflow/blob/r1.13/tensorflow/contrib/eager/python/examples/nmt_with_attention/nmt_with_attention.ipynb>

## Segment names

