Data documentation

Data

This document describes shared data that is the basis for the following manuscript:
E.V. Olesh, S. Yakovenko, and V. Gritsenko (2014) Automated Assessment of Upper Extremity Movement Impairment Due To Stroke. PLOS ONE. In press.

The data consists of motion capture data of people with stroke performing several arm movements. The data values are upper extremity joint angles (shoulder, elbow, and wrist) captured simultaneously at sequential time points with fixed frequency by two devices, Kinect sensor (Microsoft) and Impulse motion capture system (PhaseSpace). The sampling frequency of Kinect was 30 Hz, the sampling frequency of Impulse was 470 Hz.

Data for each subject is in a separate CSV file entitled SignalData_Subject#.csv, where # refers to subject ID. Subjects characteristics are described in Table 1 of the manuscript using the corresponding subject IDs.

Columns inside each data file contain angular values in radians starting from row 2, row 1 contains headers for all columns.

Metadata

Headers in SignalData_Subject#.csv files

The header name contains the following meta information:
- the type of performed movement
  - identified by idTrialType# described below
- the device that captured data
  - K for Kinect or
  - M for markers from Impulse
- the corresponding joint
  - Shoulder_Left1 for abduction/adduction angle of the left arm
  - Shoulder_Right2 for flexion/extension angle of the right arm
  - Elbow_Right for flexion/extension angle of the right arm
  - Wrist_Left for flexion/extension angle of the left arm
  - etc
- sequential run of data capture
  - Run# (single runs contain from one to several repetitions of the same type of movement)

metaTrialType.csv

The file contains meta information about the movements performed by subjects. Row 1 contains column names, rows 2 to 11 contain descriptions for movements as following:
- idTrialType - movements 1 through 10, IDs correspond to idTrialType# in data file headers
- sTrialType - description of each movement
- FMA - name of one clinical test that includes selected movements
  - FMA stands for Fugl-Meyer Assessment (Fugl-Meyer et al. 1975)

    - metadata contains names of the corresponding movements in FMA
- ARAT - name of another clinical test that includes the corresponding movement
    - ARAT stands for Action Research Arm Test (Lyle 1981)
    - metadata contains names of the corresponding movements in ARAT
    - not all movements are part of this test

metaClinicalScore.csv

The file contains clinical scores of movements performed by subjects. 30 PT student raters scored the movements from video files, which were de-identified and randomized. The raters were blinded to which side was affected by stroke. Row 1 contains column names, rows 2 onward contain values as following:

- nScore - clinical score on a 3-point FMA scale
    - 0 - no movement
    - 1 - abnormal movement
    - 2 - normal movement
- idTrialType - corresponding movement ID as described above
- nRater - ID of human rater, 1 - 30
- idVideoCodes - ID of video file used for scoring; meta information about video files is described below in metaVideoCodes.

metaVideoCodes.csv

The file contains meta information about the video files used for clinical scoring. Row 1 contains column names, rows 2 onward contain values as following:

- idVideoCodes - ID of video file used for scoring
- sLimb - arm which was used by the subject to per for the test
    - l stands for left
    - r stands for right
- nRep - consecutive number of repetition of the same movement; up to 5 repetitions were video recorded and scored
- idSubject - subject ID

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