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extracted the features, and organized these into three datasets based on their type and clinical usability. One dataset comprised basic spatio-temporal features: tapping angle, duration and speed, whereas the second feature set included two more spatio-temporal features: maximum lifting and maximum foot drop velocities. Frequency-based parameters describing tap-to-tap variability and rhythm regularity were further added forming the third feature set. The feature sets were fed to the Support Vector Machine, and the accuracy was assessed with 10-fold cross validation. Obtained results showed that frequency-based parameters contribute to better differentiation between the evaluated groups with accuracy of 83.94±1.17%.

BTI1.3

INFLUENCE OF TWO WEEKS BALANCE PRACTICE WITH FEEDBACK ON THE GAIT IN HEMIPLEGIC PATIENTS

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We hypothesized that practicing balance with feedback will improve the gait in hemiplegic patients. The practice consisted of two weeks 30-minute long Wii-Fit balance board gaming. The gait analysis was based on ground reaction pressures (GRP) recorded with the custom designed insoles. The data were collected at 100 samples per second from two insoles, each comprising five pressure (force) sensors. The sensors communicated with the host computer by a WiFi link. Custom software was developed in Matlab for automatic segmentation of the GRP data into segments belonging to swing and stance phases of each step. The examiner could correct the automatic segmentation if necessary. The outputs from the program were: pressure vs. time from all sensors and standard gait data (cadence, symmetry index, etc.). The results show that the exercise of the function with feedback has positive effects on the gait performance. The exercise period was only two weeks, and the group was small and heterogeneous; hence, a more extensive study is required for proving the significance.

BTI1.4

GYROSCOPE-BASED METHOD FOR EVALUATION OF GAIT SYMMETRY

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The hypothesis of the research was that MEMS based gyroscopes mounted on the lateral side of the thigh can be used for the assessment of the symmetry of the gait. To test the hypothesis we recorded gait characteristics with insoles in both shoes which measured the ground reaction force (GRF) distribution (five sensors per insole) and inertial measurement units (IMU) mounted on the lateral side of legs. We introduced the interval f1 when the angular rate in the sagittal plane is positive and f2 when the angular rate is negative. The symmetry of gait defined by the intervals f1 and f2 was compared with the symmetry calculated from the durations of the stance and swing phases. The analysis was performed by using the data collected in a short clinical study with twelve stroke patients. The IMU and GRF based estimated symmetries showed strong correlation ($r=0.87$, $p<0.001$). The differences between the IMU and GRF based estimated symmetries were within 4%. The results suggest that the IMU can be used instead of the GRF instrumented insoles for the assessment of the symmetry in the clinical environment.

BTI1.5

EFFECTS OF WII-FIT BALANCE BOARD EXERCISE ON THE POSTURE OF STROKE PATIENTS

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