Abstracts of the Twentieth International Congress of Parkinson’s Disease and Movement Disorders
Sensor-based motor state detection in Parkinson’s disease to approach personalized therapy delivery
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Objective: As primary objective, we acquire a data pool of medically-treated PD patients with motor fluctuations to determine the sensitivity and specificity of algorithms capable to classify the motor state in time.

Background: Motor fluctuations in Parkinson’s disease are often unpredictable and transitions between motor states (e.g., between hypokinesia and dyskinesia) often occur in short time intervals. Continuous therapies like medication pumps and subthalamic nucleus deep brain stimulation alleviate these fluctuations, however, provide rather rigid treatment regimens. Closed-loop applications might pave the way towards more personalized regimens in future, however, critically depend on valid biomarkers.

Methods: In first pilot recordings, we captured motor transitions between motor states under ongoing clinical survey and additional video documentation allowing for accurate clinical categorization. For cross-validation, we record accelerometry and gyrometry in terms of mobile inertial sensors (APDM mobility lab). We performed first exploratory analysis on these signals based on power spectral estimates.

Results: In these first preliminary analyses, we found that dyskinesias (resting position) were paralleled by a low-frequency activity increase below 4Hz. However, we expect relevant confounding from voluntary movements under daily life conditions, and expect to refine the motor state detection by adding more sophisticated classification algorithms. To this end, we plan to validate independent component analyses, and supervised learning algorithms to render the motor state classification more robust.

Conclusions: Biomarkers for automated motor state detection shall be obtained and are believed to assist personalized therapy in future.

Randomized controlled trial protocol: Balance training with rhythmical cues to improve and maintain balance control in Parkinson’s disease
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Objective: To evaluate the effects of balance training with rhythmical (BRT) which is a motor program to improve balance associated with rhythmical auditory cues (RACs). This study is ongoing in the stage 1 to 2.

Background: Postural instability is a particularly incapacitating disorder, where loss of motor independence by pelope with Parkinson’s Disease (PD) marks a significant stage of disease onset. Evidence suggests that deficits in automatic motor control, sensory integration and attention are associated with lack of balance in PD. Physiotherapy, together with medication, plays an important role in the treatment of this state.

Methods: A total of 150 PD patients at H&Y stages II–III and asymptomatic for depression and dementia were enrolled in a single-blind randomized study. Randomization was achieved via a computer-generated random-sequence table. All patients should also present a fall history. They were assigned into one of three groups, and their balance history. They were assigned into one of three groups, and their balance

Results: The preliminary results showed improvement on BRT and MT Groups TUG (p=0.01), 6 min walk (p=0.00). To BBS (p=0.00), Mini BESTest (p=0.00) only to BRT showed difference.

Conclusions: This protocol could be effective to improve balance and gait, evaluate the effects of a motor program to improve balance associated with RACs and assess whether balance training leads to activation of balance reactions.
showing an actor performing the same gestures, and then tried to repeat
the gesture. Each video-clip was composed by images and sounds of the
gestures. The sounds of gestures were obtained with the sonification
technique, by transforming kinematic data (velocity) recorded during the
execution of gesture, into pitch variations (for an example see: bt.ly/ sonif_example). The same 8 motor gestures were re-learned in the stand-
ard protocol, with a common sensory stimulation method. We evaluated
patients with functional and clinical scales before, immediately after, at 1
month, and 3 months after the treatment. We also compared gait indi-
ces with those of a normative sample of PwP and FoG (Mezzarobba
et al. 2015). Preliminary data are based on two patients.

Results: Overall, data showed that both protocols have positive
effects on functional and clinical tests. Larger performance improve-
ments were seen with the experimental protocol. In the after treatment
evaluations, the number of indices that differed from those of the norma-
tive population. Negative and decreasing values correspond to a gait profile that is more different from the normative population. A value of 0% means
that no changes were occurred in the period. Before treatment the % of indices in common with the PwP and FoG population was comparable (34% - experimental protocol, 32% - standard protocol).

Conclusions: These preliminary data suggest that a multisensory
approach could help PwP with FoG to re-learn gait movements, to
reduce freezing episodes, and that these effects could be prolonged over
time.

The effects of intensive speech treatment on intelligibility in Spanish
dysarthria secondary to Parkinson’s disease

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Objective: To examine the effects of intensive speech treatment
(LSVT-LOUD; Ramig et al., 2001) on intelligibility at conversational
level in Spanish dysarthria secondary to Parkinson’s disease (PD).

Background: The Lee Silverman Voice Treatment (LSVT-LOUD)
has been shown to improve vocal function in speakers with PD. How-
ever, its efficacy has only been established for English. Little is known
about its effects on other languages, such as Spanish.

Methods: Sixteen Spanish-speaking individuals with PD (11 males
and 5 females) received one month of LSVT-LOUD treatment. They
were native speakers of Castilian Spanish, ranging in age from 58 to 82
years (M = 70, SD = 8). Speakers were recorded producing a one-minute
emotional monologue one month and one week before treatment, as well
as one week and one month post-treatment. Twenty-one listeners (nine
men and 12 women) orthographically transcribed utterances from the
monologues produced by speakers with PD pre- and post-treatment.
Utterances were also rated for ease of understanding on a 9-point Likert
scale (1 = unintelligible; 9 = very intelligible). Thirteen healthy controls
were recorded twice throughout the study for later comparison.

Results: The mean transcription accuracy scores for speakers with
PD at baseline were significantly lower than for healthy controls
(F(1,1737) = 164.5, p < .001). The mean transcription accuracy scores for speakers with PD were 32.28% (SD = 39.62%) for the first pre-
treatment and 28.55% (SD = 33.64%) for the second pre-treatment ses-
tions. Performance did not differ significantly at baselines (p > .05).
Median intelligibility ratings were 2 and 3 at pre-tests. Positive effects
of intensive speech treatment on speech intelligibility were found
(p < .001). The mean transcription scores immediately post-treatment
were 71.72% (SD = 35.14%) and 66.08% (SD = 37.12%) at the one-
month follow-up. The increase in post-treatment performance was statisti-
cally significant (p < .001). Median intelligibility ratings were 8
immediately post-treatment and 7 at follow-up, also representing a statisti-
cally significant increase from baseline (p < .001).

Conclusions: Our data indicated an increase in intelligibility at the
conversational level as a function of intensive speech treatment for
Spanish speakers with dysarthria.

STEADY-PD III. A phase 3 study of isradipine as a disease
modifying agent in patients with early Parkinson’s disease. Baseline
characteristics of the enrolled cohort

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Objective: To evaluate the efficacy of isradipine 10 mg daily on PD
disability.

Background: Isradipine, a dihydropyridine calcium channel antagon-
ist with excellent penetration of the blood brain barrier, has been shown