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|  |  | **objectives** | **Data** | **methodology** | **features** |
| 1 (2006) | Characterize dyskinesia | * Optimization of treatment * Maximization of patient function | Intensity  modulation  Rate  Periodicity  Coordination of movement | * PCA (principal components analysis) * Maximization of patient function * EM algorithm to find natural clusters in feature space * Dunn’s index for cluster validity | * Root mean square (RMS)value * Range of the auto-covariance * cross-correlation-on-based features |
| 2 (feb 2007) | Quantification of Tremor and Bradykinesia | * Quantification of Tremor and Bradykinesia | Roll  Yaw  Pitch direction | * Remove the drift of signals using infinite impulse response (IIR) filter * Burg method for the estimation of the frequency spectrum of the signal for each window |  |
| 3 (aug 2007) | Characterize  dyskinesia & bradykinesia | * Develop a software platform to efficiently process on-board data | Intensity  modulation  Rate  Periodicity  Coordination of movement | * Davies-Bouldin clustering evaluation | * Root mean square (RMS)value * Range of the auto-covariance * cross-correlation-on-based features |
| 4(jan 2009) |  | * longitudinal data collection |  |  | * maximum peak-to-peak amplitude * mean * RMS * Peak velocity * RMS of the jerk time series |
| 5 (jun 2009) | Fog detection | * design an unobstructed system * maximum battery life |  |  |  |
| 6 (nov 2009) | Monitor  motor fluctuations | * estimation of the severity of Parkinsonian symptoms and motor complications * facilitate the titration of medication in patients with late state Parkinson |  | * filter implementation as IIR filters based on eliptic design * Support Vector Machines (SVM) | * Data range * Root mean square (RMS)value * cross-correlation-on-based features * Frequency-based features * Signal entropy |
| 7 (mar 2010) | FOG detection | * Automatically detect FOG * Rhythmic auditory signal feedback * Reduce the number and length of their motor blocks * Increase safety while walking |  | * Modular research platform |  |
| 8 (sept 2010) | Monitor  motor fluctuations | * Home monitoring for improving the standards of health care * Making efficient and cost effective the process |  | * Support Vector Machines (SVM) | * Signal entropy * RMS * Data range * Cross-correlation |
| 9 (mar 2011) | Monitor  motor fluctuations | * facilitate the titration of medication in patients with late state Parkinson * real-time clinician interaction |  |  |  |
| 10 (may 2012) | Assessment of tremor | * propose an automated method for both resting and action/postural tremor assessment |  | * Hidden Markov models | * angle between sensors /Low-Frequency (LF) energy * Spectrum entropy/LF and HF energy/Ratio of high to total energy |
| 11 (2012) | FOG detection | * Automatically detect FOG * Rhythmic auditory signal feedback |  | * Correlation based feature Selection * Supervised machine learning techniques from the Weka data mining suite | * mean * variance * standard deviation * entropy |
| 12 (jan 2013) | Characterize motor symptoms during TUG and FOG | * valuable information for the evaluation of treatment and early diagnosis of people with Parkinson’s disease |  |  | * Midswing was first detected by the positive peak of pitch angular velocity |
| 13 (sep 2013) | FOG detection | * Support gait rehabilitation * Automatically detect FOG * Rhythmic auditory signal feedback * comfortable | Cadence  Step length  Trunk posture  Gait speed  Gait asymetry | * ABF application and algorithms |  |
| 14 (mar 2015) | FOG detection | * Independent use * Gait assistance at unsupervised envir. * Automatically detect FOG * Rhythmic auditory signal feedback * Long term monitoring |  | * Machine learning algorithms | * Power of locomotion band (PL) * Power on freeze band (PF) * Total Power (TP) * Freeze Index (FI) |
| 15 (2017) | FOG detection | * Investigate FOG * Real time signal processing platform |  | * True Positives and False Positives method | * Freezing index * Spectral coherence |