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ML- Volunteering Work

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GitHub link: https://github.com/naveen-kumar68/Machine-learning.git

Dataset 1: Parkinson's Disease and fNIRS Motor Task Dataset

This dataset includes functional Near-Infrared Spectroscopy (fNIRS) recordings obtained from Parkinson's disease (PD) patients and healthy controls while performing different motor tasks. The data were recorded to examine cortical activity patterns of motor performance, particularly in the context of neurodegenerative disorders. Participants undertook tasks like walking, resting, and finger tapping, and the respective brain signals were recorded by fNIRS systems. Each subject's data are organized into folders with SNIRF files for multiple tasks, as well as ancillary metadata files in JSON format. These metadata files detail the recording parameters, channel and optode setup, and coordinate system data. The dataset allows researchers to investigate variability in cortical activation across PD patients and control subjects, so it is useful for research on motor function, disease progression, and potential biomarkers for Parkinson's disease.

Overview

This dataset provides functional Near-Infrared Spectroscopy (fNIRS) recordings from subjects with Parkinson's Disease (PD) and age-matched controls. Recordings were taken during a set of motor tasks such as walking, rest, and finger tapping in order to study cortical activity patterns related to motor control in neurodegenerative disorders.

Data Collection

fNIRS signals were recorded using high-resolution systems whilst participants performed the motor tasks. Each participant has their own folder which includes:

SNIRF files for all task conditions

JSON metadata files that describe:

Recording parameters

Channel and optode configuration

Coordinate system and spatial registration information

Dataset Structure

Format: SNIRF (neuroimaging), JSON (metadata)

Subjects: Parkinson's Disease patients and healthy controls

Tasks: Resting, Walking, Finger Tapping

Size**:** ~270 MB (277,052 KB)

Organization: One folder per subject, one file per task

Usage

This dataset is appropriate for:

Analyzing activation of the motor cortex in PD

Examining inter-subject variability of cortical function

Investigating biomarkers of disease progression and motor dysfunction

Drawbacks

Variability in subjects' performance in the task may influence signal interpretation

Spatial resolution of fNIRS is inferior to other imaging modalities

Dataset 2: Motor Practice and fNIRS Imaging Dataset in BIDS Format

This dataset follows the Brain Imaging Data Structure (BIDS) standard and includes both behavioral and neuroimaging data collected during a motor learning experiment involving healthy participants. Over multiple days, participants engaged in finger and foot movement tasks, logging details such as practice duration, self-assessment scores (on a 1–10 scale), and subjective notes in a structured logbook (practicelogbook.tsv). The dataset contains phenotype data, experimental stimuli, and individual participant directories (sub-XX) that hold NIRS

recordings taken under various motor task conditions (e.g., fingerauto, fingernonautodual). Each subject directory has SNIRF files, event timing annotations (_events.tsv), channel and optode placement information, and metadata files recording the setup and task design. The combination of behavioural measures and brain imaging data facilitates rich analysis of motor learning, task difficulty, and neuroplasticity through time. The structured organization of the dataset, along with full metadata, make it especially useful for longitudinal investigations and multimodal analysis.

Overview

This dataset includes longitudinal fNIRS and behavioral data obtained in a motor learning experiment with healthy subjects. It is in the Brain Imaging Data Structure (BIDS) format and combines brain imaging recordings with rich behavioral measures, facilitating strong multimodal analysis of neuroplasticity and motor skill acquisition across time.

Data Collection

Participants executed finger and foot movement tasks over several days. Data collection comprises:

fNIRS recordings in SNIRF format

Task annotations in _events.tsv

Logbook entries (practicelogbook.tsv) with:

Practice duration

Self-report scores (1–10 scale)

Subjective comments on task difficulty or experience

Data for each participant are saved in a sub-XX/ directory with full metadata, optode/channel mapping, and task condition information.

Dataset Structure

Format: BIDS-compliant (SNIRF, TSV, JSON)

Subjects: Healthy adult participants

Tasks: e.g., fingerauto, fingernonautodual

Size: ~625 MB (640,610 KB)

Directories: sub-XX/ folders per subject

Includes: Behavioral logs, metadata, stimuli files, events, and optode setup

Usage

This dataset is particularly suited for:

Examining motor learning and adaptation

Measuring task-related hemodynamic responses

Longitudinal examination of neuroplastic alteration

Assessing task difficulty impact on cortical activation

Strengths

Completely BIDS-formatted to be compatible with analysis tools

Rich dataset of behavioural and neuroimaging information

Optimal for time-series and progression examination

Limitations

Only contains healthy participants (no clinical control group)

Self-report measures can introduce subjective bias