



EEG Classification

A Comparative Study



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Purpose



Methodology



Literature Review

1. EEG-based Brain-Computer Interfaces (BCIs): A Survey of Recent Studies on Signal Sensing Technologies and Computational Intelligence Approaches and their Applications, Xiaotong Gu, Zehong Cao, Alireza Jolfaei, Peng Xu, Dongrui Wu, Tzyy-Ping Jung, Chin-Teng Lin (<https://arxiv.org/abs/2001.11337>)
2. Deep learning for electroencephalogram (EEG) classification tasks: a review, Alexander Craik, Yongtian He and Jose L Contreras-Vidal, Published 9 April 2019, Journal of Neural Engineering, Volume 16, Number 3 (<https://iopscience.iop.org/article/10.1088/1741-2552/ab0ab5>)




Task Datasets

1. DEAP - Emotion Classification - <http://www.eecs.qmul.ac.uk/mmv/datasets/deap/>
2. BCI2000 - Motor Imagery - <https://www.physionet.org/content/eegmmidb/1.0.0/>



EEG Classification Overview

1. EEG Signal Acquisition
2. Signal Pre-processing
3. Feature Extraction
4. Machine Learning



EEG Signal Acquisition

1. Wet Sensor Technology
2. Dry Sensor Technology



Signal Pre-processing

1. Sampling
2. Filtering
3. Artifact Handling



Feature Extraction

1. Raw Signal Values
2. Calculated Features
3. Image



Machine Learning

1. Machine Learning
2. Convolutional Neural Networks
3. Recurrent Neural Networks
4. Deep Belief Networks
5. Other Approaches