

Machine learning based framework for EEG/ERP analysis

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Introduction

Event-Related Potential (ERP) analysis of Electroencephalography (EEG) data has been widely used in research on language, cognition, and pathology [1,2]. The high dimensionality (time x channel x condition) of a typical EEG/ERP dataset makes it a time-consuming prospect to properly analyse, explore, and validate knowledge without a particular restricted hypothesis. This study proposes an automated, empirical, and greedy approach to the analysis process to determine an EEG dataset for the location, robustness, and latency of ERPs, if any, present in a given dataset.

Objectives

Provide an automated reliable analysis method that is capable of replicating traditional analysis techniques. The framework should also be capable of reducing averaging requirements and providing insight on many aspects of detected ERP signals.

Framework

Design Scheme

A given EEG/ERP dataset with more than one experimental condition should show a significant difference across latencies and sites that contain information on a differing signal (ERP). This can be obtained by simplification to a binary classification problem. Also, this can be extended to classification between experimental groups across a particular set of conditions [3].

Preprocessing

Raw data is filtered, passed through a semi-automated artifact rejection algorithm, corrected for ocular artifacts using ICA, and finally referenced to linked mastoids. Data is segmented for all relevant stimulus triggers and sorted into experimental conditions.

Feature Extraction

Observations are taken to be a single-trial or an average of 2-4.8, or 16 randomly sampled trials from a class. Features fed into the classification algorithm are the preprocessed amplitudes in addition to the mean, skewness, variance, and kurtosis of said values.

Classification

Linear classification support vector machines [4] using the libsvm (v3.21, [5]) implementation in MATLAB (2018a).

Validation

Monte-Carlo bootstrapping was set to yield 95% confidence intervals on each model's prediction accuracy on the testing set [2].

Framework (Cont.)

Analysis Outputs

- Latency of detected signal across an epoch's time axis
- Topography of signal detected across the scalp utilizing the dense electrode arrays (64+) needed by the proposed framework
- Size and consistency of signal provided by accuracies across both modalities and the five trial-averages per observation settings (see feature extraction)

Significance Criteria

- Accuracies before stimulus presentation is expected to yield chance (50%) and hence is used as a baseline
- Confidence intervals at a significant point must not intersect with respective intervals from the baseline
- Confidence intervals must not intersect with chance accuracy

Datasets

Dataset 1: P300 [6]

- Standard tones (82%)
- 3 deviant tones (8% each)
- Active response
- 20 healthy participants

Dataset 2: MMN [7, 8]

- Standard tones (82%)
- 3 deviant tones (8% each)
- Passive listening with silent video
- 15 healthy participants

Data Acquisition

EEG was recorded on 64 electrodes placed in accordance with the international 10-20 system using a bandwidth of 0.01 Hz to 100 Hz.

Results

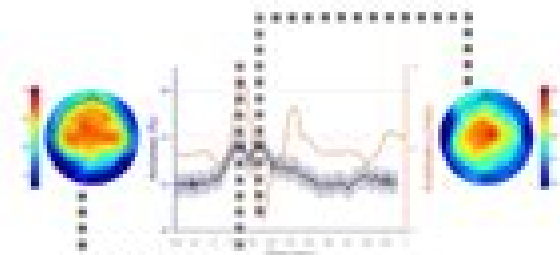
A) P300 dataset



Classification accuracy between frequency deviants and standard tones (black), with 95% confidence intervals (shaded region), difference from baseline, and topographic accuracy (heat map) based on further statistical analysis corresponding to the MMN (red), and the P300 (blue).

Results (Cont.)

B) MMN dataset



Classification accuracy between frequency deviants and standard tones (black), with 95% confidence intervals (shaded region), difference from baseline, and topographic accuracy (heat map) based on further statistical analysis corresponding to the MMN (red), and the P300 (blue).

Discussion

The proposed framework was capable of providing clear indications of the latencies and topographies of ERPs in their respective datasets. The mined information closely followed what can be found in the literature in regards to each of the ERPs in question.

Automatically analyzing the three datasets was also capable of highlighting other discrepancies between tested conditions which would not have been normally detected when using traditional analysis methods.

The analysis scheme produced models capable of accurate discrimination of ERPs utilizing only a small number of trials and minimal use of averaging.

References

- [1] Boshra, R. G., Boshra, R. G., Connolly, J. F., Reilly, J. M., Ruiter, K., ... & Reilly, J. M. (2018). Event-related potentials in clinical research: guidelines for design, recording, and analysis. *Neurology*, 91(1), 1-11.
- [2] Reilly, J. M., Boshra, R. G., Connolly, J. F., Reilly, J. M., & Reilly, J. M. (2018). Event-related potentials: a review of the literature and its application to clinical research. *Neurology*, 91(1), 1-11.
- [3] Boshra, R. G., Reilly, J. M., Connolly, J. F., Reilly, J. M., & Reilly, J. M. (2018). Event-related potentials: a review of the literature and its application to clinical research. *Neurology*, 91(1), 1-11.
- [4] Boshra, R. G., Reilly, J. M., Connolly, J. F., Reilly, J. M., & Reilly, J. M. (2018). Event-related potentials: a review of the literature and its application to clinical research. *Neurology*, 91(1), 1-11.
- [5] Boshra, R. G., Reilly, J. M., Connolly, J. F., Reilly, J. M., & Reilly, J. M. (2018). Event-related potentials: a review of the literature and its application to clinical research. *Neurology*, 91(1), 1-11.
- [6] Boshra, R. G., Reilly, J. M., Connolly, J. F., Reilly, J. M., & Reilly, J. M. (2018). Event-related potentials: a review of the literature and its application to clinical research. *Neurology*, 91(1), 1-11.
- [7] Boshra, R. G., Reilly, J. M., Connolly, J. F., Reilly, J. M., & Reilly, J. M. (2018). Event-related potentials: a review of the literature and its application to clinical research. *Neurology*, 91(1), 1-11.
- [8] Boshra, R. G., Reilly, J. M., Connolly, J. F., Reilly, J. M., & Reilly, J. M. (2018). Event-related potentials: a review of the literature and its application to clinical research. *Neurology*, 91(1), 1-11.

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Chang-Hwan Im



Eegerp Analysis Methods And Applications:

EEG/ERP Analysis Kamel Nidal,Aamir Saeed Malik,2014-10-23 Changes in the neurological functions of the human brain are often a precursor to numerous degenerative diseases Advanced EEG systems and other monitoring systems used in preventive diagnostic procedures incorporate innovative features for brain monitoring functions such as real time automated signal processing techniques and sophisticated amplifiers Highlighting the US Europe Australia New Zealand Japan Korea China and many other areas EEG ERP Analysis Methods and Applications examines how researchers from various disciplines have started to work in the field of brain science and explains the different techniques used for processing EEG ERP data Engineers can learn more about the clinical applications while clinicians and biomedical scientists can familiarize themselves with the technical aspects and theoretical approaches This book explores the recent advances involved in EEG ERP analysis for brain monitoring details successful EEG and ERP applications and presents the neurological aspects in a simplified way so that those with an engineering background can better design clinical instruments It consists of 13 chapters and includes the advanced techniques used for signal enhancement source localization data fusion classification and quantitative EEG In addition some of the chapters are contributed by neurologists and neurosurgeons providing the clinical aspects of EEG ERP analysis Covers a wide range of EEG ERP applications with state of the art techniques for denoising analysis and classification Examines new applications related to 3D display devices Includes MATLAB codes EEG ERP Analysis Methods and Applications is a resource for biomedical and neuroscience scientists who are working on neural signal processing and interpretation and biomedical engineers who are working on EEG ERP signal analysis methods and developing clinical instrumentation It can also assist neurosurgeons psychiatrists and postgraduate students doing research in neural engineering as well as electronic engineers in neural signal processing and instrumentation *Quantitative EEG Analysis Methods and Clinical Applications* Shanbao Tong,Nitish V. Thankor,2009 This authoritative volume provides an overview of basic and advanced techniques used in quantitative EEG qEEG analysis The book provides a wide range of mathematical tools used in qEEG from single channel descriptors to the interactions among multi channel EEG analysis Moreover you find coverage of the latest and most popular application in the field including mental and neurological disease detection monitoring physiological and cognitive phenomena research and fMRI *Neurofeedback and Neuromodulation Techniques and Applications* Robert Coben,James R. Evans,2010-11-25 The study of neurofeedback and neuromodulation offer a window into brain physiology and function suggesting innovative approaches to the improvement of attention anxiety pain mood and behavior Resources for understanding what neurofeedback and neuromodulation are how they are used and to what disorders and patients they can be applied are scarce and this volume serves as an ideal tool for clinical researchers and practicing clinicians in both neuroscience and psychology to understand techniques analysis and their applications to specific patient populations and disorders The top scholars in the field have been enlisted and contributions offer both the breadth

needed for an introductory scholar and the depth desired by a clinical professional Includes the practical application of techniques to use with patients Includes integration of neurofeedback with neuromodulation techniques Discusses what the technique is for which disorders it is effective and the evidence basis behind its use Written at an appropriate level for clinicians and researchers

Brain and Behavior Computing Mridu Sahu,G R Sinha,2021-06-23 Brain and Behavior Computing offers insights into the functions of the human brain This book provides an emphasis on brain and behavior computing with different modalities available such as signal processing image processing data sciences statistics further it includes fundamental mathematical model algorithms case studies and future research scopes It further illustrates brain signal sources and how the brain signal can process manipulate and transform in different domains allowing researchers and professionals to extract information about the physiological condition of the brain Emphasizes real challenges in brain signal processing for a variety of applications for analysis classification and clustering Discusses data sciences and its applications in brain computing visualization Covers all the most recent tools for analysing the brain and it s working Describes brain modeling and all possible machine learning methods and their uses Augments the use of data mining and machine learning to brain computer interface BCI devices Includes case studies and actual simulation examples This book is aimed at researchers professionals and graduate students in image processing and computer vision biomedical engineering signal processing and brain and behavior computing

The Neural Control of Locomotion: Current Knowledge and Future Research Monika Pötter-Nerger,Ioannis Ugo Isaias,2022-07-14

Translational Applications of Neuroimaging Stavros Skouras,David M. A. Mehler,Amelie Haugg,2024-04-04 Despite substantial progress in the development of neuroimaging methodologies translational applications of neuroimaging remain scarce This Research Topic invites article submissions that present promising neuroimaging applications and methods addressing critical needs for improving health outcomes These may include Original Research Clinical Trial Systematic Review or Methods articles that investigate neuroimaging metrics as outcome measures or in combination with neural perturbation techniques e g neurofeedback neurostimulation other translational applications e g guiding neurosurgery To foster debate we also welcome critical Review Opinion and Perspective articles that survey the field and its progress towards clinical utility

Computational EEG Analysis Chang-Hwan Im,2018-08-16 This book introduces and reviews all of the currently available methods being used for computational electroencephalogram EEG analysis from the fundamentals through to the state of the art The aim of the book is to help biomedical engineers and medical doctors who use EEG to better understand the methods and applications of computational EEG analysis from a single well organized resource Following a brief introduction to the principles of EEG and acquisition techniques the book is divided into two main sections The first of these covers analysis methods beginning with preprocessing and then describing EEG spectral analysis event related potential analysis source imaging and multimodal neuroimaging and functional connectivity analysis The following section covers application of EEG analysis to specific fields

including the diagnosis of psychiatric diseases and neurological disorders brain computer interfacing and social neuroscience Aimed at practicing medical specialists engineers researchers and advanced students the book features contributions from world renowned biomedical engineers working across a broad spectrum of computational EEG analysis techniques and EEG applications

Artificial Intelligence Applications for Health Care Mitul Kumar Ahirwal, Narendra D. Londhe, Anil Kumar, 2022-04-19 This book takes an interdisciplinary approach by covering topics on health care and artificial intelligence Data sets related to biomedical signals ECG EEG EMG and images X rays MRI CT are explored analyzed and processed through different computation intelligence methods Applications of computational intelligence techniques like artificial and deep neural networks swarm optimization expert systems decision support systems clustering and classification techniques on medial datasets are explained Survey of medical signals medial images and computation intelligence methods are also provided in this book Key Features Covers computational Intelligence techniques like artificial neural networks deep neural networks and optimization algorithms for Healthcare systems Provides easy understanding for concepts like signal and image filtering techniques Includes discussion over data preprocessing and classification problems Details studies with medical signal ECG EEG EMG and image X ray FMRI CT datasets Describes evolution parameters such as accuracy precision and recall etc This book is aimed at researchers and graduate students in medical signal and image processing machine and deep learning and healthcare technologies

Niedermeyer's Electroencephalography Donald L. Schomer, Fernando H. Lopes da Silva, 2018 Niedermeyer's Electroencephalography Basic Principles Clinical Applications and Related Fields Seventh Edition keeps the clinical neurophysiologist on the forefront of medical advancements This authoritative text covers basic neurophysiology neuroanatomy and neuroimaging to provide a better understanding of clinical neurophysiological findings This edition further delves into current state of the art recording EEG activity both in the normal clinical environment and unique situations such as the intensive care unit operating rooms and epilepsy monitoring suites As computer technology evolves so does the integration of analytical methods that significantly affect the reader's interpretations of waveforms and trends that are occurring on long term monitoring sessions Compiled and edited by Donald L Schomer and Fernando H Lopes da Silva along with a global team of experts they collectively bring insight to crucial sections including basic principles of EEG and MEG normal EEG EEG in a clinical setting clinical EEG in seizures and epilepsy complementary and special techniques event related EEG phenomena and shed light on the future of EEG and clinical neurophysiology Akin to an encyclopedia of everything EEG this comprehensive work is perfect for neurophysiology fellows as well as neurology neurosurgery and general medical residents and for the interns and medical students and is a one stop shop for anyone training in EEG or preparing for neurophysiology or epilepsy board exams

Handbook of Electroencephalography and Clinical Neurophysiology, 1971 Experimental Techniques in Human Neuropsychology H. Julia Hannay, 1986 This unique sourcebook describes the research methods used to study human brain function and brain behavior relationships

ranging from simple methods such as dichotic listening and tachistoscopic presentation to computerized techniques

What Can Neuroscience Learn from Contemplative Practices? Zoran Josipovic, Bernard J. Baars, 2016-09-22 A recent wave of brain research has advanced our understanding of the neural mechanisms of conscious states contents and functions A host of questions remain to be explored as shown by lively debates between models of higher vs lower order aspects of consciousness as well as global vs local models Baars 2007 Block 2009 Dennett and Cohen 2011 Lau and Rosenthal 2011 Over some twenty five centuries the contemplative traditions have also developed explicit descriptions and taxonomies of the mind to interpret experiences that are often reported in contemplative practices Radhakrishnan Rinbochay reflexivity or self knowing associated with consciousness the sense of self and consciousness and aspects of consciousness that are said to continue during sleep These real or claimed aspects of consciousness have not been fully integrated into scientific models so far This Research Topic in Consciousness Research aims to provide a forum for theoretical proposals new empirical findings integrative literature reviews and methodological improvements inspired by meditation based models We include a broad array of topics including but not limited to replicable findings from a variety of systematic mental practices changes in brain functioning and organization that can be attributed to such practices their effects on adaptation and neural plasticity measurable effects on perception cognition affect and self referential processes We include contributions that address the question of causal attribution Many published studies are correlational in nature because of the inherent difficulty of conducting longitudinal experiments based on a major lifestyle decision such as the decision to commit to a mental practice over a period of years We also feature clinical and case studies integrative syntheses and significant opinion articles

Techniques in Psychophysiology Irene Martin, Peter Henry Venable, 1980

EEG Signal Processing Saeid Sanei, Jonathon A. Chambers, 2013-05-28 Electroencephalograms EEGs are becoming increasingly important measurements of brain activity and they have great potential for the diagnosis and treatment of mental and brain diseases and abnormalities With appropriate interpretation methods they are emerging as a key methodology to satisfy the increasing global demand for more affordable and effective clinical and healthcare services Developing and understanding advanced signal processing techniques for the analysis of EEG signals is crucial in the area of biomedical research This book focuses on these techniques providing expansive coverage of algorithms and tools from the field of digital signal processing It discusses their applications to medical data using graphs and topographic images to show simulation results that assess the efficacy of the methods Additionally expect to find explanations of the significance of EEG signal analysis and processing with examples and a useful theoretical and mathematical background for the analysis and processing of EEG signals an exploration of normal and abnormal EEGs neurological symptoms and diagnostic information and representations of the EEGs reviews of theoretical approaches in EEG modelling such as restoration enhancement segmentation and the removal of different internal and external artefacts from the EEG and ERP event related potential signals coverage of major abnormalities such as seizure and

mental illnesses such as dementia schizophrenia and Alzheimer s disease together with their mathematical interpretations from the EEG and ERP signals and sleep phenomenon descriptions of nonlinear and adaptive digital signal processing techniques for abnormality detection source localization and brain computer interfacing using multi channel EEG data with emphasis on non invasive techniques together with future topics for research in the area of EEG signal processing The information within EEG Signal Processing has the potential to enhance the clinically related information within EEG signals thereby aiding physicians and ultimately providing more cost effective efficient diagnostic tools It will be beneficial to psychiatrists neurophysiologists engineers and students or researchers in neurosciences Undergraduate and postgraduate biomedical engineering students and postgraduate epileptology students will also find it a helpful reference

How Do Brains Work? Theodore Holmes Bullock,1993 I ll bet it will tum out that brains use both mechanisms in different centers Much of my waking life and that of many of my friends is spent racking our brains over how brains work This book claims that good science is often a form of betting on the outcome of research the stakes being time and reputation and someone s money Some scientists to be sure claim they avoid leaning this way or that in the name of keeping an open mind I recommend making expectations explicit in order to design controls against unconscious influence formulate alternative outcomes more clearly and to add zest Both the immediately upcoming experiment and the expected result of many long years of work by many people after one is gone are proper subjects for betting or the most informed and serious guessing The working title for this collection of new and old papers was for some time Betting on how brains work and then Betting on brains It goes without saying that the book will not answer the title question but will speak to it in particular making a series of propositions that I think are more likely to be confirmed by future research than the alternatives we can presently recognize It follows that a significant message implied in many chapters of the book is this

Proceedings of the 1992 International Biomedical Engineering Days, August 18-20, 1992, İstanbul, Turkey Yekta Ülgen,1992

Third International Conference on Photonics and Imaging in Biology and Medicine Qingming Luo,2003

CSA Neurosciences Abstracts ,1999

The 13th Convention of Electrical & Electronics Engineers in Israel, Tel Aviv, 22-24 March 1983 ,1983

Cognitive Neuroscience Jamie Ward,2009

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