

AROUSAL DETECTION USING EEG SIGNAL

*Dissertation submitted in partial fulfillment of the requirement for
The award of degree of*
Master of Engineering
In
Electronic Instrumentation and Control



Submitted by
Surabhi Gangwar
(801151027)

Under the supervision of
Mr. Mooninder Singh
Assistant Professor

July 2013
**Department of Electrical and Instrumentation
Engineering
Thapar University**

(Established under the section 3 of UGC act, 1956)
Patiala, 147004

DECLARATION

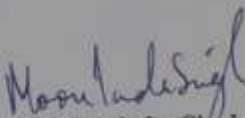
I hereby certify that the work is being presented in the dissertation work entitled "AROUSAL DETECTION USING EEG SIGNAL" in fulfillment of award of degree of Master of Engineering in Electronic Instrumentation and Control submitted in Electrical and Instrumentation Engineering Department, Thapar University, Patiala is an authentic record of my own work carried under the supervision of Mr. Mooninder Singh, Assistant Professor, Department of Electrical and Instrumentation Engineering, Thapar University, Patiala, Punjab.

Date: 15/7/2013

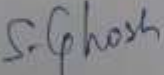

Surabhi Gangwar
801151027

It is certify that the above statement made by the student is correct to the best of my knowledge and belief.

Date: 15/7/2013


Mr. Mooninder Singh
Assistant Professor, EIED
Thapar University, Patiala
Punjab

Countersigned By


Dr. Smarajit Ghosh
Professor & Head, EIED
Thapar University, Patiala
Punjab


Dr. S.K Mohapatra
Dean of Academic Affairs
Thapar University, Patiala
Punjab

ABSTRACT

Emotion has an important role in interaction and communication between people. Emotion can be expressed either verbally through emotional vocabulary, or by expressing non-verbal cues such as intonation of voice, facial expressions and gestures. In recent years, estimation of human emotions from Electroencephalogram (EEG) signals plays a vital role in developing intellectual Brain Computer Interface (BCI) devices. In this work, we have analyzed the EEG signals of the 4 different participants from the dataset. The Data set is provided on the enterface06 site, But this data is raw EEG data. The work describes how to extract data in text form from this raw form. EEGLAB. This extracted data is then decomposed in subbands with the help of the wavelet transform in MATLAB. Features useful for emotion classification are then extracted. An ANN based classification system for human emotion by using Electroencephalogram (EEG) is used. Total three statistical features are computed and feed-forward back-propagation neural network is applied for the classification of human emotion. In the experiment we classify emotion in two classes, high arousal (HA) and low arousal (LA).

ACKNOWLEDGEMENT

I would like to express my sincere thanks to many people who have contributed to the fulfillment of my dissertation. First of all, I am especially thankful to my dissertation guide, **Mr. Mooninder Singh**, Assistant Professor and extremely grateful to **Dr. Mandeep Singh**, Associate professor, Department of Electrical and Instrumentation Engineering, Thapar University, Patiala, for their valuable guidance, scholarly inputs and consistent encouragement I received throughout the dissertation work. It was very good experience to working under him.

I am thankful to **Dr. Smarajit Ghosh**, Head of Department, Electrical and Instrumentation Engineering, Thapar University, Patiala for his encouragement and support. I am thankful to all the faculty members and staff members of the department of Electrical and Instrumentation Engineering, Thapar University for their support during my academic years.

I want to thank God for always being with me and pray him to always shower his blessings on me. I would like to thank my mother, father and my brother **AKASH** for their unwavering support. Without them I certainly would not have been where I am today, it would not have been possible for me to quest for postgraduate studies and objective for greater affairs in my vacation. I am proud to dedicate this thesis and all the good things in my life to them. Without them I could do nothing. I owe my dissertation to them.

This vote of thanks will be incomplete if I fail to thank **Amandeep cheema**, **Paramjeet**, **Prachi Sharma**, **Rajiv kumar**, **Mohit kumar** and my family members who stood beside me, understood my academic goals and helped me to achieve it. Last but not by any means least, my heartiest thanks to all the persons, who made me what I am today; word fails to express my feelings for them.

Bangwar
Surabhi Gangwar

ORGANIZATION OF THESIS

The thesis begins by introducing Emotions, Human brain and how we measure brain activity, basic models of emotion in Chapter 1. This is followed by a discussion of previous work that has already been carried out in the classification of emotions in Chapter 2. Chapter 3 data collection for the present work done. Chapter 4 explains the methodology on which the whole work stands and Chapter 5 delves into the results obtained into tabular form and discussions over the result. Finally, Chapter 6 concludes the thesis and outlines directions for future work. The thesis ends with references and publications from the present research.

TABLE OF CONTENTS

Particulars	Page No.
Declaration	I
Abstract	II
Acknowledgement	III
Table of contents	V
List of Figures	VII
List of Tables	VIII-IX

Contents

1. INTRODUCTION.....	1
1.1. Introduction	1
1.2. Human Brain.....	2
1.3. Emotion.....	4
1.3.1 Models of emotion.....	4
1.3.2 Basic emotions	4
1.3.3 Dimensional view	5
1.4. The Emotional Brain.....	6
1.5. Measuring brain activity	8
1.5.1. Functional magnetic resonance imaging.....	8
1.5.2. Positron emission tomography.....	8
1.5.3. Electroencephelography.....	9
2. LITRATURE REVIEW.....	11
2.1. Literature Review	12
2.2. Other literature on emotion recognition using physiological signals.....	12
3. DATA COLLECTION.....	14
4. METHODOLOGY.....	17
4.1. Electrode Data Selection.....	17

4.2. Preprocessing of EEG signal.....	18
4.3. Discrete Wavelet Transform.....	19
4.4. Analysis using DWT.....	19
4.5. Feature Extraction.....	20
4.6. Matlab Functions.....	21
4.7. Artificial Neural Network.....	22
4.7. Classification.....	243
5.RESULTS.	26
5.1.TEST1: Feature extraction	26
5.2. TEST2: CLASSIFICATION.....	89
6.CONCLUSION AND FUTURE SCOPE.....	93

List Of Figures

Figure 1.1 Cerebrum divided into four lobes	3
Figure 1.2 Different Emotions	4
Figure 1.3 Different emotions on the valence and arousal scale.....	5
Figure 1.4 The human brain.....	7
Figure 1.5 Example of a FMRI scanning system. Image.....	9
Figure 1.6 Example of PET emission scanning	10
Figure 1.7 The 10-20 electrode placement system	11
Figure 5.1 Accuracy of classification through entropy	93
Figure 5.2 Accuracy of classification through variance	94
Figure 5.3 Accuracy of classification through power	95
Figure 5.4 Comprehensive results.....	96

List of tables

Table 4-1 Decomposition of eeg signals into different frequency bands with a sampling frequency of 256 hz	20
Table 4.2 Matlab Functions.....	21
Table 5.1 Entropy in different bands of participant one 1st 10 events for High Arousal	26
Table 5.2 Entropy in different bands of participant one next 10 events for High Arousal	27
Table 5.3 Entropy in different bands of participant one 1st 10 events for Low Arousal	29
Table 5.4 Entropy in different bands of participant one next 10 events for Low Arousal	30
Table 5.5 Entropy in different bands of participant two 1st 10 events for High Arousal	31
Table 5.6 Entropy in different bands of participant two next 10 events for High Arousal	33
Table 5.7 Entropy in different bands of participant two 1st 10 events for Low Arousal	34
Table 5.8 Entropy in different bands of participant two next 10 events for Low Arousal	35
Table 5.9 Entropy in different bands of participant three 1st 10 events for High Arousal	37
Table 5.10 Entropy in different bands of participant three next 10 events for High Arousal	38
Table 5.11 Entropy in different bands of participant three 1st 10 events for Low Arousal	40
Table 5.12 Entropy in different bands of participant three next 10 events for Low Arousal	41
Table 5.13 Entropy in different bands of participant four 1st 10 events for High Arousal	42
Table 5.14 Entropy in different bands of participant four next 10 events for High Arousal	44
Table 5.15 Entropy in different bands of participant four 1st 10 events for Low Arousal	45
Table 5.16 Entropy in different bands of participant four next 10 events for Low Arousal	46
Table 5.17 Variance in different bands of participant one 1st 10 events for High Arousal	48
Table 5.18 Variance in different bands of participant one next 10 events for High Arousal	49
Table 5.19 Variance in different bands of participant two 1st 10 events for Low Arousal	50
Table 5.20 Variance in different bands of participant one next 10 events for Low Arousal	52
Table 5.21 Variance in different bands of participant two 1st 10 events for High Arousal	53
Table 5.22 Variance in different bands of participant two next 10 events for High Arousal	54
Table 5.23 Variance in different bands of participant two 1st 10 events for Low Arousal	56
Table 5.24 Variance in different bands of participant two next 10 events for Low Arousal	57
Table 5.25 Variance in different bands of participant Three 1st 10 events for High Arousal	59
Table 5.26 Variance in different bands of participant Three next 10 events for High Arousal	60
Table 5.27 Variance in different bands of participant Three 1st 10 events for Low Arousal	61
Table 5.28 Variance in different bands of participant Three next 10 events for Low Arousal	63
Table 5.29 Variance in different bands of participant Four 1st 10 events for High Arousal	64
Table 5.30 Variance in different bands of participant Four next 10 events for High Arousal	66
Table 5.31 Variance in different bands of participant Four 1st 10 events for Low Arousal	67
Table 5.32 Variance in different bands of participant four next 10 events for Low Arousal	68
Table 5.33 Power in different bands of participant one 1st 10 events for High Arousal	70
Table 5.34 Power in different bands of participant one Next 10 events for High Arousal	71

Table 5.35 Power in different bands of participant one 1st 10 events for Low Arousal.....	73
Table 5.36 Power in different bands of participant one next 10 events for Low Arousal	74
Table 5.37 Power in different bands of participant Two 1st 10 events for High Arousal	75
Table 5.38 Power in different bands of participant Two next 10 events for High Arousal	77
Table 5.39 Power in different bands of participant Two 1st 10 events for Low Arousal	78
Table 5.40 Power in different bands of participant two next 10 events for Low Arousal	79
Table 5.41 Power in different bands of participant Three 1st 10 events for High Arousal	81
Table 5.42 Power in different bands of participant Three next 10 events for High Arousal	82
Table 5.43 Power in different bands of participant Three 1st 10 events for Low Arousal	84
Table 5.44 Power in different bands of participant Three for low Arousal next 10 events	85
Table 5.45 Power in different bands of participant Four 1st 10 events for High Arousal	86
Table 5.46 Power in different bands of participant Four next 10 events for High Arousal	88
Table 5.47 Power in different bands of participant Four 1st 10 events for Low Arousal.....	89
Table 5.48 Power in different bands of participant Four next 10 events for Low Arousal.....	91
Table 5.49 Accuracy of classification by entropy.....	92
Table 5.50 Accuracy of classification by variance	93
Table 5.51 Accuracy of classification by Power.....	94
Table 5.52 Accuracy of classification.....	95
Table 5.53 comprehensive results.....	96

4.6. Introduction

Emotion has an important role in interaction and communication between people. One of the commonly accepted definitions of emotion is “A natural instinctive state of mind deriving from ones circumstances mood or relationship with others”. Emotion can be expressed either verbally through emotional vocabulary, or by expressing non-verbal cues such as intonation of voice, facial expressions and gestures. . If someone smiling and shouting “Shut up” at someone it does not have the same meaning as saying it while aggressively shouting “SHUT UP”. The Greek philosopher *Aristotle* thought of emotion as a stimulus that evaluates experiences based on the potential for gain or pleasure. Years later, in the seventeenth century, Descartes considered emotion to mediate between stimulus and response. Nowadays there is still little consensus about the definition of emotion Kleinginna and Kleinginna gathered and analyzed 92 definitions of emotion from literature [1].

Emotion is a complex set of interactions among subjective and objective factors, mediated by neural/hormonal systems, which can:

1. Give rise to affective experiences such as feelings of arousal, pleasure/displeasure;
2. Generate cognitive processes such as emotionally relevant perceptual effects, appraisals, labeling processes;
3. Activate widespread physiological adjustments to the arousing conditions; and
4. Lead to behavior that is often, but not always, expressive, goal directed, an adaptive.

In spite of the difficulty of precisely defining it, emotion is omnipresent and an important factor in human life. People's moods heavily influence their way of communicating, but also their acting. Imagine two drivers, one being happy and the other being very mad. They will be driving totally differently. Emotion also plays a crucial role in all-day communication. One can say a word like `OK' in a happy way, but also with

disappointment or sarcasm. Mostly communication this meaning is interpreted from the tone of the voice or from non-verbal communication. Other emotions are in general only expressed by body language, like boredom.

There are many difficulties in automatic human emotion identification. Since emotion expresses a natural instinctive state of mind, the outward expression may be voluntarily controlled as per the environment or the circumstances. A person when feeling angry may shout at his child, but may suppress this in front of his boss. Straight forward connection of facial actions with neural signals or with emotions may not be correct. EEG signal changes according to the emotional state. On the other hand changes that occur in EEG signal cannot be voluntarily controlled and hence become a better indicator of emotions. One of the motives to study detection of emotions is to make robots communicate with humans in a natural way. Emotion detection using EEG signals can be of help in this communication it may be mentioned here that to design experiments to single out a unique emotion is a very challenging task .As even small changes in the experimental setup may lead to significant differences in the results.

A large part of communication is done now a day by computer or other electronic devices. But this interaction is a lot different from the way human beings interact naturally. Mostly Communication between human beings involves non-verbal signs, and the social form of this communication is important. On the other hand the interaction between humans and computers is done there, use of a simple keyboard and mouse, that works fine in many cases. And now many other forms of human computer interaction have been invented .Speech recognition by computers is improving and this is becoming more and more common in consumer products. It is speculated that the speech recognition process shall be able to detect the emotion by sensing the tone of the speech. Arm movement is used when playing games on a game console.

4.7. Human Brain

Scientists agree on the fact that the human brain is the main source of emotion. However, the precise role of the brain is not clear. Many theories exist about the exact involvement of the brain.

The human brain can be divided into three parts: cerebrum, cerebellum and the brain stem. The cerebrum is the largest part and is responsible for initiation of movement, coordination of movement, sensing temperature, touch, vision, hearing, judgment, reasoning, problem solving, emotions and learning. The cerebrum is divided into four lobes as shown in Figure 1.1. They are frontal lobe, occipital lobe, parietal lobe & temporal lobe.

The smaller part of the brain is called the cerebellum. The main purpose of the cerebellum is to coordinate voluntary muscle movements and to maintain posture, balance and equilibrium. The brain stem is the middle part of the brain. This part is responsible for movement of the eyes and mouth: it relays sensory messages like voice pain, temperature etc. It is also responsible for controlling respiration, hunger, consciousness, cardiac functions, body temperature etc[2]. EEG is a very powerful tool in neurology. The electroencephalogram (EEG) is a non-invasive, multi-electrode recording of time varying electric potentials that generated due to activation of millions of neurons [3]. The voltage range of EEG signal is 3-100 μ V which is 100 times weaker than ECG signal.

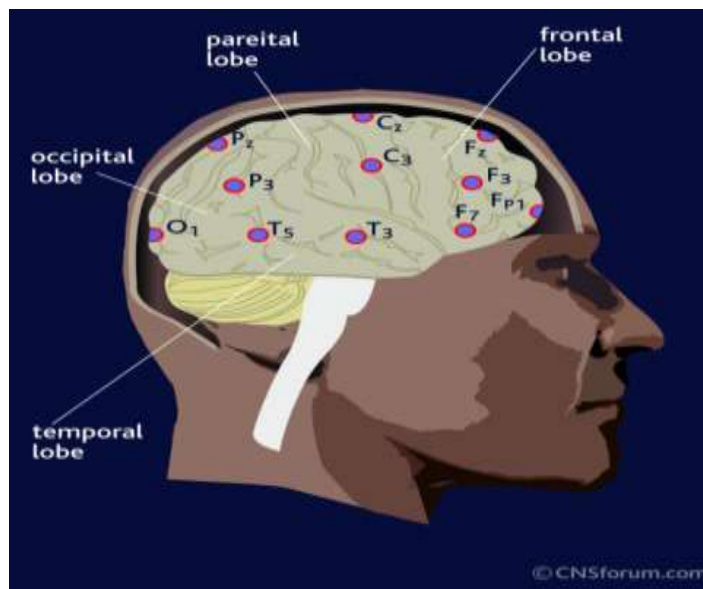


Figure 1.1 Cerebrum divided into four lobes

4.8. Emotion

Emotion is an important aspect of the interaction and communication between people. emotion is a concept that is hard to define. They can be expressed either verbally through emotional vocabulary, or by expressing non-verbal cues such as intonation of voice, facial expressions and gestures [4]. In this context, decoding emotional cues are essential to correctly interpret a message. Most of the researchers have focused on facial expression recognition and speech signal analysis for assessing emotions [5, 6].



Figure 1.2 Different Emotions

1.3.1 Models of emotion

Emotion is a phenomenon that is difficult to grasp. In order to classify and represent emotions, some models have been proposed. There are two dominant models.

1.3.2 Basic emotions

One of the models uses the idea that all emotions can be composed of some basic emotions, just as colors can be composed of primary colors. Plutchik's [7] relates eight basic emotions, and based thereupon he claims these to be the basic emotions: anger, fear, sadness, disgust, surprise, curiosity, acceptance, and joy. Ekman [8] has chosen

other emotions to be basic, and has found that these emotions and expressions of these emotions are universal. Ekman's list of basic emotions is: anger, fear, sadness, happiness, disgust and surprise.

1.3.3 Dimensional view

Another model is composed of multiple dimensions, and places every emotion on a multidimensional scale. The first dimension is emotional valence, with positive on the one and negative on the other side. The second axis contains the arousal, from calm to excite. The third dimension is not always used, and when used, it is not always the same. Sometimes dominance is used as the third dimension. Other times it is motor activation (approach or avoid) that is on the third axis.

A pictorial representation of some of the emotions is shown in the figure 1.2

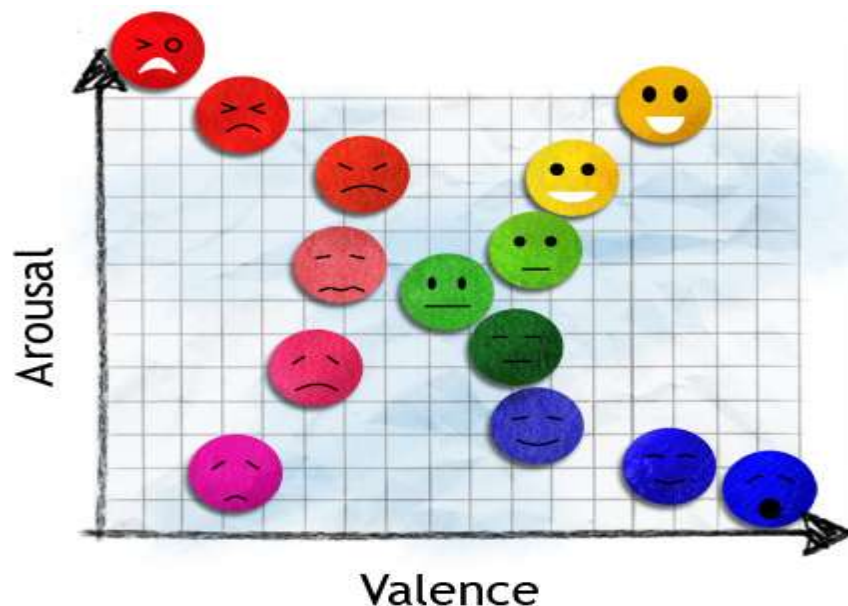


Figure 1. 3 Different emotions on the valence and arousal scale

- **Valence**

Most apparent things about emotion in EEG measurements is the difference between the left and the right hemisphere. It has been suggested that information about the valence dimension can be found in this difference, which is called the hemispherical emotional valence (Hev)[9].

- **Arousal**

Where there is a lot of information about EEG properties of the valence dimension, less is known about how to measure arousal using EEG signals. Many studies have been done but the results are less obvious than for the valence dimension. The main conclusion from earlier research shows that the right posterior hemisphere has something to do with arousal. This has also been confirmed the research of Aftanas et al. State that right posterior hemispheres and left anterior both hemispheres are involved with arousal[10].

Most literature on emotion recognition uses the dimensional model of emotions because of its simplicity and universality.

4.9. The Emotional Brain

For years, scientists have reasoned about and researched emotion. One of the first theory proposed was the James-Lange theory, in the end of the 19th century. This theory states that emotion is the experience of some changes in the body. For example: when one sees a lion, he will run away, and running away will provide him the feeling of fear.

Cannon and Bard challenged this theory in 1920, among others because bodily changes are too slow to be responsible for emotions and artificial body changes are insufficient to generate emotions. They state that the hypothalamus is the brain region that translates stimuli into emotions. Some years later, Papanicolaou augmented this idea and made a nice scheme of how emotion would be processed in the brain [11]. It consists of two streams, the stream of feeling and the stream of thinking. He claimed that emotional experiences are a function of the activity of both streams, that is computed in the cingulate cortex.

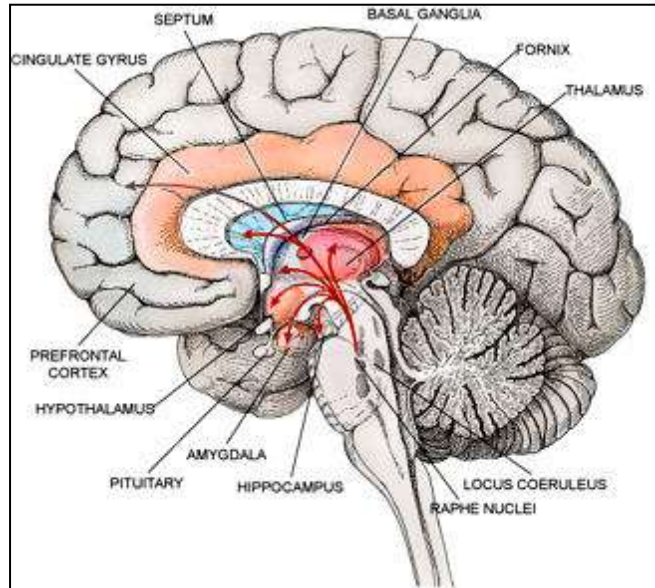


Figure 1.4 The human brain

In 1949, Maclean introduced another, more accurate model, and invented the term limbic system. He claimed (as a neo-Jamesian) that perception of the world, combined with information on body changes generates emotional experience, and this integration of knowledge occurs in the limbic system. This theory of the limbic system has been the dominant theory for a long time, although it is now thought that some structures of the limbic system play a less important role, and some other structures play a more important role in the emotional brain. Some of these structures are:

- **Amygdala** The amygdala are two groups of neurons deep inside the human brain. Together, they are one of the most important brain regions for emotion. Together they are called the amygdala. One of its functions is to **interpret the emotional** value of incoming signals. When a person receives some sort of signal with some emotional load, it is recognized by the amygdala. Another function of this organ is **fear conditioning**: it helps in learning a connection between some stimulus and a threatening event. For example, when a rat hears a sound and gets an electric shock, he will connect these two things after a number of combinations.

Afterwards, he will become afraid of the sound. A third important function of the amygdala is the consolidation of long-term emotional memories.

- **Prefrontal cortex** Just as the amygdala, the prefrontal cortex (PFC) plays a role in the reward process. Neurons in the Pfc can detect changes in the reward value of learning stimuli [12]. Furthermore, the PFC is involved in planning, making decisions based on earlier experiences and working towards a goal. The combination of functions of the PFC is described as the executive function'.
- **Anterior cingulated cortex** This part of the brain is generally subdivided into a 'cognitive and an effective' part. The affected part is suggested to monitor disagreement between the functional state of the organism and any new information, that might have affective consequences [13].
- **Hypothalamus** The hypothalamus is the part of the brain that controls many processes in the body, such as body temperature, hunger and thirst. It also handles there lease of some hormones. As such, the hypothalamus is involved in processing emotions and sexual arousal.
- **Insular cortex** The insular cortex is said to be associated with emotional experience and produces conscious feelings. It combines sensory stimuli to create a emotional context.

4.10. Measuring brain activity

Brain is the part of the body that regulates almost all of the human activity. Therefore the activity of the brain contains a lot of information .There are Several ways of measuring this activity such as positron emission tomography (PET),functional magnetic resonance imaging (fMRI) and electroencephalography (EEG).

1.5.1. Functional magnetic resonance imaging

Functional magnetic resonance imaging (fMRI) depends on the blood flow. Active neurons are known to consume oxygen that is carried by hemoglobin. This

consumption of oxygen in the blood changes the magnetic properties of hemoglobin, and these magnetic properties are measured by the FMRI. So that brain activity is measured. FMRI has a high spatial resolution, but a low temporal resolution and the equipment needed is very expensive.



Figure 1.5 Example of a FMRI scanning system. Image

1.5.2. Positron emission tomography

With positron emission tomography (pet), a radioactive isotope is injected into the blood. Because this isotope emits positrons, and is taken with the blood flow, a machine can measure the blood flow. Since it is believed that the blood flow in the brain is highly correlated with brain activity. The machine can show brain activity. PET is able to measure activity with a high spatial resolution, but it has a low time resolution and a time delay due to the time it takes before the radioactive material has arrived at the brain. Another disadvantage of this method is the radiation a person is subjected to.

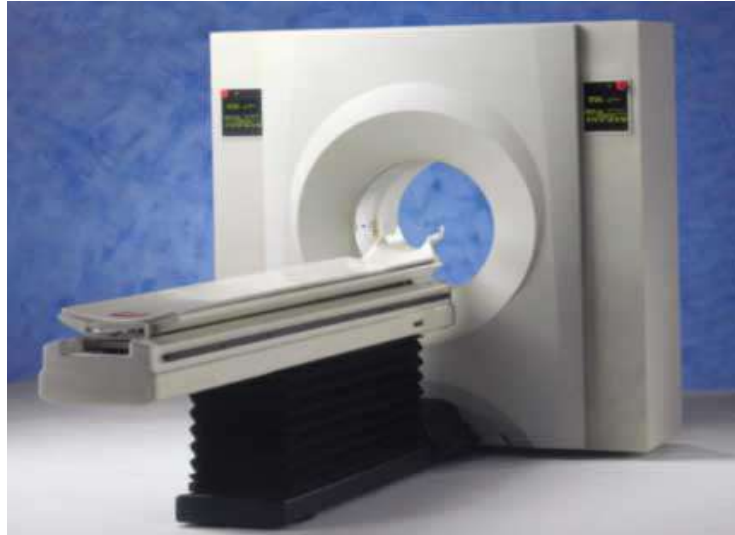


Figure 1.6 Example of PET emission scanning

1.5.3. Electroencephelography

Human Brain is the most complex organ in all the systems in the human body. In medical terms, the human brain is also called an Encephalon and the medical technique that reads the scalp electrical activity of the Encephalon is called ELECROENCEPHALOGRAPH (EEG).

For EEG measurements an array of electrodes is placed on the scalp. There are so Many caps available use 19 electrodes, although the number of caps using more electrodes is rising. The electrodes are placed according to the international10-20 system, as is depicted in figure 1.6.This system makes results from different research easily comparable.

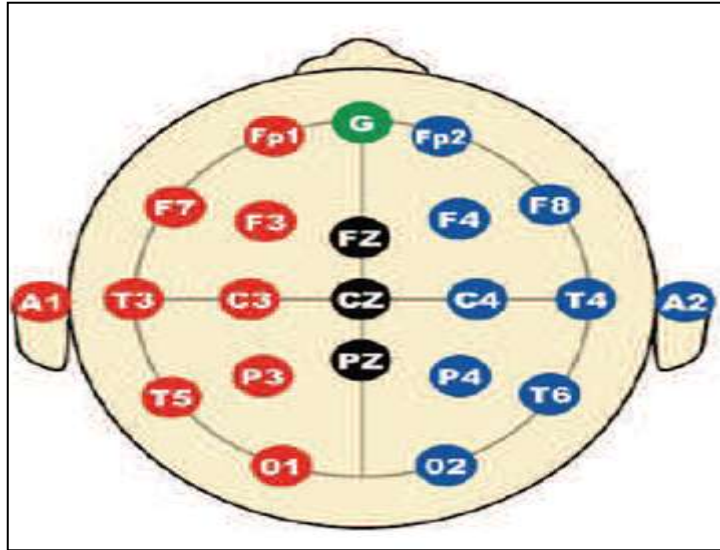


Figure 1.7 The 10-20 electrode placement system

Rhythmic activity

The neuron of the brain produces together a rhythmic signal that is constantly present. This signal can be divided into several bands on the basis of frequency.

Delta band The delta band is the frequency band up to 4Hz. Delta activity is mainly Seen in deep sleep.

Theta band The theta band consists of frequencies between 4Hz and 8Hz. This activity Can be observed with drowsiness or meditation

Alpha band The alpha band is the so-called basic rhythm' and contains the frequencies between 8Hz and 16Hz. It is seen when people are awake, and is known to be more apparent when eyes are opened.

Beta band The beta band contains frequencies between 16Hz and 32Hz. This band is apparent with active thinking or concentration.

Gamma band the gamma band contains frequencies between 32 to 64 Hz.

4.11. Literature Review

Gaulin, Steven J. C. et al suggested that the physiology of emotion is closely linked to arousal of the nervous system [14].

Robert Horling divided training data into three parts; one is used for testing while the other two are used for training the classifier. The classification rate for valence dimension has been found to be 31% for both Enterface06 and self-collected experimental data. Using a neural network, the classification rates were 31% and 28% respectively for valence and arousal. A naive Bayes classifier produced slightly lower results of 29% for valence and slightly better results for arousal i.e. 35% [9]

4.12. Other literature on emotion recognition using physiological signals

Some researchers have used physiological signals to detect emotion. For example, Choppin has built an emotion recognizer for patients suffering from amyotrophic lateral sclerosis (ALS) [15]. These patients lose, at some moment during their disease, their ability to use their muscles, and those patients lose their ability to speak or to communicate on any other way. For that reason, Choppin used EEG signals to recognize emotion. The author used neural networks to classify the EEG signals online, and achieved a correct classification rate for new unseen samples of about 64%, when used three emotion classes. Mainly because of the low number of training data, but also because the project was very preliminary, these results can be improved.

Musha *et. al* [16] also used EEG signals to read a person's emotion. They extracted cross-correlation coefficients between the EEG activities from different locations, to find information about the correlation between the EEG signals from different locations. The author has computed an 'emotion matrix' to transform these coefficients linearly into a four element vector that corresponds with 4 basic emotions.

The numbers in the vector denote how strong that particular emotion is found in the EEG signals. The authors do not mention the accuracy of their system.

Chanel et. al [17] tried to recognize only the arousal dimension of emotion from EEG and other physiological measures. The activity in specific EEG bands on specific locations on the scalp was used as features to describe the EEG data. Results showed the usability of EEG's in arousal recognition and the interest of fusion with other physiological signals. The author used different classifiers (FDA and naive Bayes classifier) to classify the EEG signals the physiological signals and a combination of both. Results showed that the EEG signals performed equally well as the physiological signals, but a combination of both improved the results. Classification rates were around 60% when using two classes and 50% when used three classes. According to the paper, when fusing EEG and peripheral features, the improvement was better with FDA than with the Bayes classifier.

Kim et. al [18] have used other physiological measures, such as electrocardiogram (ECG) and skin temperature to build a user-independent system for recognizing emotion. The support vector machine used to implement the system was able to correctly classify 78% and 62% of the samples, in case of three and four different emotions respectively.

Haag et al. [19] used bio-sensors to find out whether they are suitable for complementing or replacing other modalities in measuring emotion or not. In particular, the authors used Electromyography (EMG), ECG, skin conductivity, blood volume pulse and respiration rate. This resulted in 96.6% correct classification for arousal and 89.93% for valence.

Large amount of research and analysis has been done to classify various states of human behavior. Several psychologists have suggested a different number of the basic emotion states, ranging from 2 to 18 categories, but there has been considerable agreement on the following six: anger, disgust, fear, happiness, sadness and surprise. Plutchik considered eight basic states of emotions anger, fear, sadness, disgust, surprise, curiosity, acceptance, and joy to be elementary ones [6] while Ekman considered five emotion states fear, sadness, happiness, disgust and surprise as basic ones [7].

Russell, J.A.(1980) discussed that the feelings like joy, happiness, fear, angry, depressed, displeasure are not independent but are interrelated. The affective states were represented as a circle in a two dimensional space. Russell prescribed an affective space model for illustrating dimensional approach in which emotion is described through two dimension space of Valence and Arousal. In this approach, arousal was given number one on the circle and emotion describing words or phrases were so placed that the similar meaning words were closer while the opposites lied diagonally. The circumplex model of affect as proposed in his study is shown below [20].

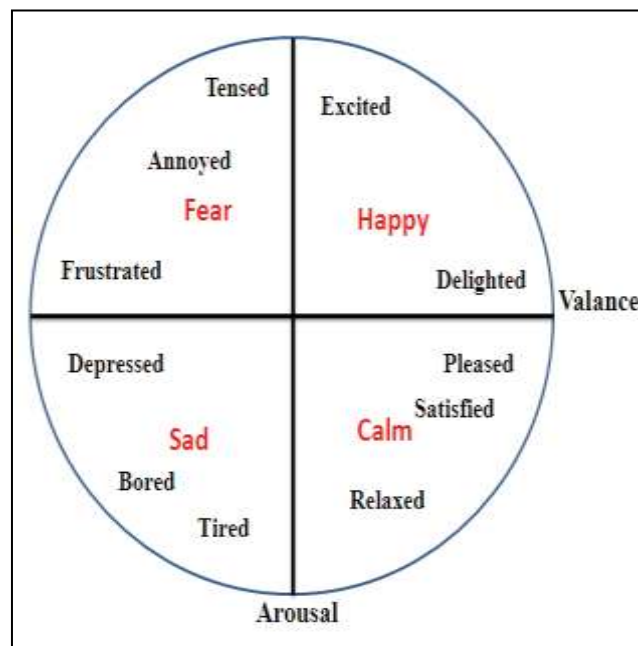


Figure 2.1 Circumplex model

CHAPTER 3

DATA COLLECTION

The different states of emotion can be induced using pictures, music, videos, combination of audios and videos or remembering the happenings that caused different emotional states. These resources for studying emotional states can be selected individually or online available resources like international affective picture system (IAPS)[21], International affective audio system (IADS) can be used. The IAPS is data sets of pictures segregated with respect to their mean arousal and mean valence values and provided by the NIMH center of University of Florida on request. The assessments of valence and arousal values have been done using a Self Assessment Manikin method. The type of stimuli selected independently will have to be evaluated for its valence and arousal values individually under suitable laboratory conditions. The emotion states thus elicited in a person can be analyzed by extracting features from the electroencephalogram signal (EEG) and/or other physiological signals such as galvanic skin resistance (GSR), blood pressure (BP), respiration Rate, heart rate and body temperature etc. acquired using an EEG cap and sensors respective to the physiological signals under consideration. A lot of works have already been done, but only few EEG signal data which can be used for detection of emotion have been made available for further exploration. Luckily, there is one available from the enterface website. This EEG data is obtained from different participants using EEGCAP. Stimulation is given by showing IAPS(International Affective Picture Set) pictures. It provides sufficient data for us to do some further work on the feature extraction and emotion classification.

We have collected all our raw EEG signals from the database of Enterface'06 (referred to as the Enterface database) that was built by Savran *et al.* as our initial dataset. AS an experimental protocol, each participant was made to undergo three sessions. In each session the participant was shown 30 picture sets each picture set pertains to one class of emotion named as POS, NEG and CALM and contains five images. these five images are shown for 12.5 seconds each, thus totally to 12.5 second exposure. In between the two picture sets, we have a black screen for 10 seconds. The participant gives self assessment of the picture set period. These self-assessments are

measured because emotions are known to be very subjective and dependent on previous experience, One can never be sure that the person feels the emotion that was intended by the pictures, and this self-assessment gives a good possibility to compare the results between persons. However, self-assessments are known to be very subjective, and hard to compare. For example, some persons tend to give extreme scores where others always choose the center.

Some problems with this experimental design are given by Savran *et. al*:

- Participants reported a headache at the end of each session, due to the different caps (they also wore a functional magnetic resonance imaging (fMRI) cap)
- Positive responses were not always felt, but the negative images were a bit too hard.
- Several participants said that the effects of the images decreases after viewing many images [21].

To construct the EEG database, emotion had to be elicited with the participants. The researchers have chosen to use images for emotional stimulation, in particular images from the International Affective Picture System (IAPS). The subset of images used in this experiment could be divided into three different emotional classes: calm, exiting positive(POS) and exiting negative(NEG). Data which is downloaded from enterface site has 2 files, one is BDF file and other is mark file.

MRK file contains index of samples for each block of images. These files are named as follows:

PARTA_IAPS_SESB_EEG_fNIRS_DDMMAAAA.bdf
PARTA_IAPS_SESB_EEG_fNIRS_DDMMAAAA.mrk

Here A is the participant number (1-4), B is the session number (1-3) and DDMMAAAA represents the date of the recording.

EEG data from different electrodes is available in multiple text format. The challenge here is to correlate the data with the time when the picture are shown to the subject. The data is first down sampled at 256 samples per second to reduce the size. The

mark file has information of pictures shown. Since the data has 12.5seconds of first picture set viewing, it means that the first $256 \times 12.5 = 3200$ samples correspond to EEG signal when the picture are being shown. The EEG data for next 10 seconds is for assessment when the black screen is shown. It means that next $256 \times 10 = 2560$ samples need not be analysed. Similarly next 3200 samples are for a class of emotion given in mark file, while the next 2560 samples need to be ignored one emotion set of 12.5 second i.e 3200 sample is processed for feature extraction. The feature extracted is to be used for classification of emotion.

There is one other folder named as common data in downloaded data, which contain the files given below.

- IAPS_Images_EEG_fNIRS.txt, contains three columns, one per session, with the names of the IAPS pictures used in this study;
- IAPS_Eval_Valence_EEG_fNIRS.txt and IAPS_Eval_Arousal_EEG_fNIRS.txt contain in three columns the valence or arousal value for each image;
- IAPS_Classes_EEG_fNIRS.txt list in three columns the associated classes we considered for each block of pictures. Labels can be “Calm”, “Pos” or “Neg”. This can be useful if one does not want to take into account self-assessment of participants.

Delorme, *et. Al* (2003) in the paper “**EEGLAB**”(an open source toolbox for analysis of single-trial EEG dynamics including independent component analysis) described the development of an open source toolbox that works on the MATLAB platform in which an EEG data from a channel can be imported for processing and analyzing operations. It includes the functions to perform preprocessing operations like baseline removal, change of sampling rate, Artifact removal and filtering as well as operations like independent component analysis (ICA) and statistical analysis. The data analyzing operations can be performed by using a graphic user interface. Other flexible attributes are provided for the ease of users. EEGLAB is freely available at <http://www.sccn.ucsd.edu/eeglab/> under the GNU public license for noncommercial use and open source development, together with sample data, user tutorial and extensive documentation [22]. From this lab we select the data according to our need, that is, for high arousal and low arousal values we changed it’s sampling rate from 1024 to 256.

CHAPTER 4

METHODOLOGY

EEG spectrum contains some characteristic waveforms that fall primarily within four frequency bands—delta (0–4 Hz), theta (4–8 Hz), alpha (8–16 Hz), and beta (16–32 Hz). Such methods have proved beneficial for various EEG characterizations, suffer from large noise sensitivity.

In 1980, a powerful method called the discrete wavelet transforms (DWT) was introduced. Since the early days, work done for frequency subband separation of EEG signal for emotion classification is based only on the decomposition of the signal to certain levels. This is followed by feature extraction from these subbands. Classification of emotions is done on the basis of these features. The methodology of this research is given figure1 in the flow chart.

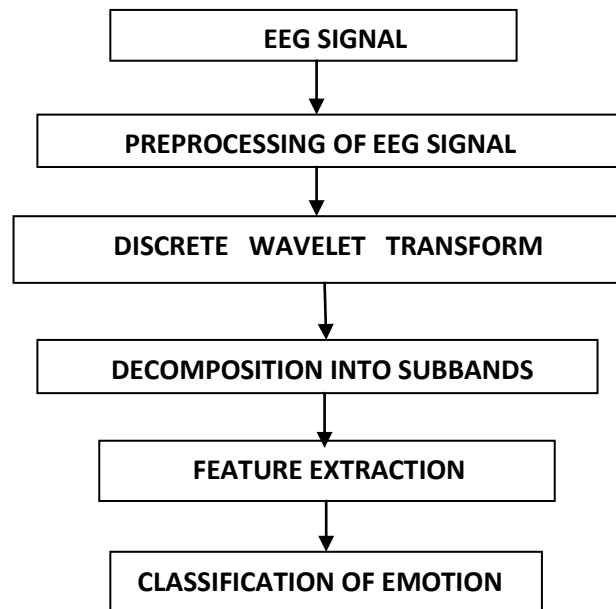


Figure 4.1 Flowchart for emotion classification

4.1. Electrode Data selection

Of 64 electrode data available in EEGLAB, we chose the data from Cz, Fz, C3, C4, P3 and P4 this choice is based on the recommendation [11].

4.2. Preprocessing of EEG signal

Preprocessing is a state of preprocess EEG signal in such a way to remove baseline and we perform this by subtracting its average of the signal from the original signal.

4.3. Discrete Wavelet Transform

There are no general methods of EEG analysis. Traditionally time and frequency domains have been considered for analyses of EEG signals. In both time and Frequency methods, an EEG signal is considered as a realization of a random process. Random processes are characterized by probability distributions and their moments (e.g. Power, entropy, means, variances, power spectral densities, skewness). The discrete wavelet transform (DWT) is quite an effective tool for Time-Frequency analysis of signals. Wavelet transform can be defined as a spectral estimation technique in which any general function can be expressed as a sum of an infinite series of wavelets [23]. The decomposition of the signal results in a set of coefficients called wavelet coefficients. Wavelet transforms has the advantages of time frequency localization, multi-rate filtering, and scale-space analysis. Wavelet transform uses a variable window size over the length of the signal.

4.4. Analysis Using Dwt

DWT successfully analyses the multi-resolution signal at different frequency bands, by decomposing the signal into approximation and detail information. The method for frequency band separation for EMOTION recognition is implemented in MATLAB 2011a. EMOTION recognition using EEG requires feature extraction from the acquired signal in specific frequency range of delta, theta, alpha, beta, and gamma. Though some researchers have mentioned the use of DWT decomposition to obtain these bands. Bands which are decomposed are given in table I.

After a first level decomposition, two sequences representing the high and low resolution components of the signal are obtained. The low-resolution components are further decomposed into low and high resolution components. After a second level decomposition, three more decompositions are done as shown in figure 2.

CA1, CA2, CA3, CA4 and CA5 are the approximate coefficients.

And CD1, CD2, CD3, CD4 and CD5 are the detailed coefficients obtained after successive decomposition.

The multi-resolution analysis, using five levels of decomposition, yields five separate EEG sub-bands. The main objective of the proposed method of is Wavelet Transform the division of the original EEG signals into different frequency bands.

Table 4.1 decomposition of eeg signals into different frequency bands with a sampling frequency of 256 hz

Frequency Range (Hz)	Frequency Bands	Decomposition Level	Frequency Bandwidth (Hz)
0-4	THETA	CA5	4
4-8	DELTA	CD5	4
8-16	ALPHA	CD4	8
16-32	BETA	CD3	16
32-64	GAMMA	CD2	32
64-128	NOISE	CD1	64

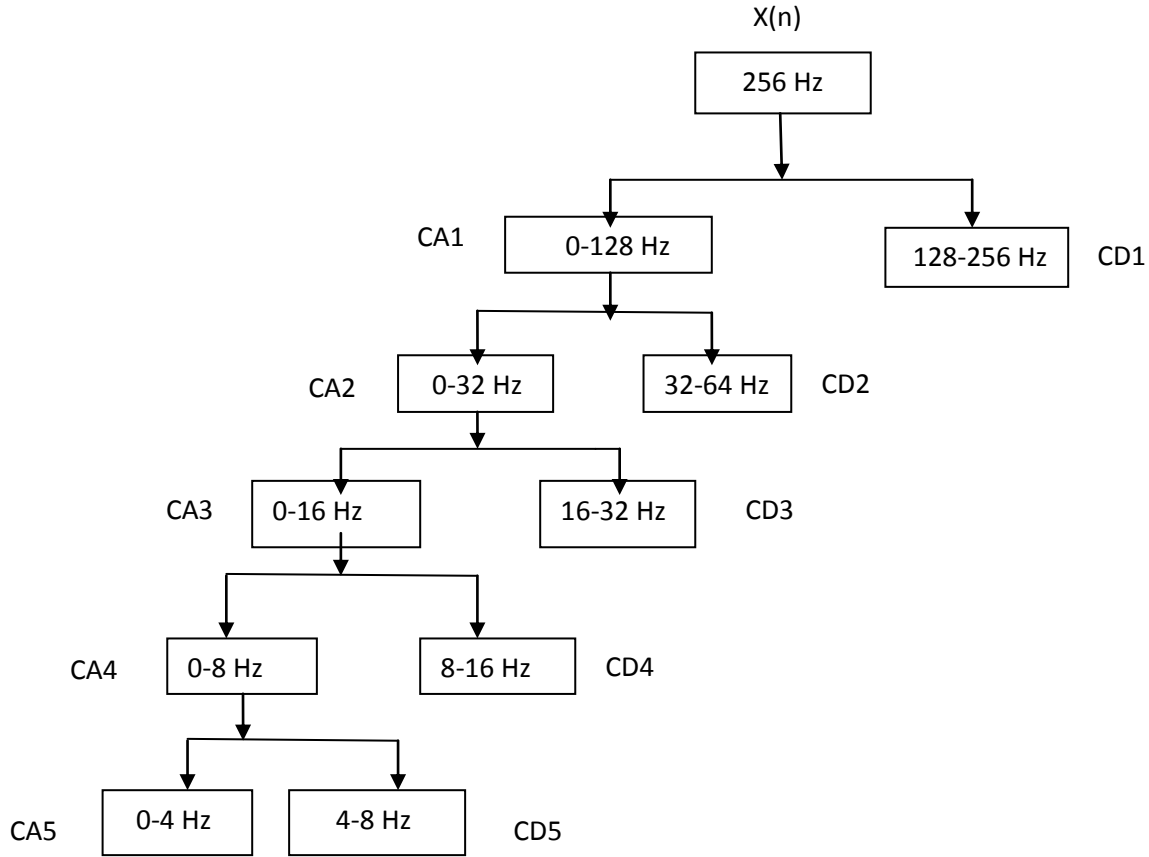


Figure 4.2 Decomposition of Signal into its approximation and detail coefficients.

4.5. Feature Extraction

Some of the parameters derived for EMOTION classification are defined here under:

- **Entropy:** Entropy is a numerical measure of the randomness of a signal. Entropy can act as a feature and used to analyze psychological time series data such as EEG data. The Entropy can thus be calculated as:

$$e = - \sum_1^n x^2 - \log(x^2)$$

Entropy is the statistical description of the variability within the EEG signal and is a strong feature for EMOTION classification.

- **Power:**

Measure the amplitude of EEG signal the power can be calculated as:

$$\text{Power} = \sum X^2 / L(X)$$

- **Variance:** Variance is defined as a measure of the dispersion of a set of data points around their mean value. Assume some random variable X that have the sample values of each EEG subband signal. Let the sample value of X is $X_i = \{X_1, X_2, \dots, X_n\}$. Where i represent a sample No index entries found. set from the subbands delta, theta, alpha, beta, and gamma. The variance can thus be expressed as

$$Y^2 = \sum (X - \mu)^2 / n$$

Where μ is the mean value of the set X and n is the number of samples in the EEG dataset.

4.6. Matlab Functions

Matlab functions used in the study are summarized in the Table 4.2.

Table 4.2 Matlab Functions

S.no.	Function	Use	Syntax
1.	DWT	DISCRETE WAVELET TRANSFORM	[CA1,CD1]=DWT(s,'db2')
2.	WENTROPY	ENTROPY	e1= wentropy(DELTA,'shannon')
3.	VAR	VARIANCE	y1= var(DELTA)
4.	STD	STANDARD DEVIATION	Sdd=std(DELTA)

Features mentioned above are extracted from each subband the EEG data. The subbands of EEG are (Delta, Theta, Alpha, Beta and Gamma) which are decomposed using wavelet transform.

Matlab program to extract these features, are given below:

1. Find out average value of the signal.
2. Subtract the average from the original signal.
3. Take the transpose of this pre-processed signal.
4. Apply wavelet transform to decompose this signal in different frequency bands.
5. Find the entropy in each band of the signal.
6. Normalize the entropy of each sub-band by dividing sum of entropy is all sub-bands.
7. Step 5 and 6 are repeated for power and variance calculation

Features so extracted are from 40 events 20 for High arousal events and 20 for Low arousal events. Feature extraction steps given above are performed in Matlab and we get the feature in the normalized form i.e. the values in between 0 and 1.

4.7. Artificial neural network

A typical artificial neural network is made up of a hierarchy of layers, and the neurons in the networks are arranged along these layers. The neurons connected to the external environment form input and output layers. Weights are the basic means of long-term memory in artificial neural networks. A neural network learns through repeated adjustments of these weights. The weights are modified to bring the network input output behavior into line with that of the environment. Each neuron is an elementary information-processing unit [24]. For the feedforward back-propagation networks, the mode of training is supervisory, because the steps in the algorithm involve the comparison of actual outputs with desired outputs associated with the set of training patterns. A feedforward neural network is of two one type is a single layer perceptron and another is a multilayer feedforward neural network. For the feedforward neural network, the information propagation is only in the forward direction and there are no feedback loops but the errors are back-propagation during training [25].

4.8. Classification

The neural network toolbox consists of a set of functions and structures which easily handle neural networks. We can use graphical user interface (GUI) or command-line operations or simple coding by using m-file. Neural networks are very good at pattern recognition problems. A neural network with enough elements (called neurons) can classify any data with reasonable accuracy.

First step design of ANN is to decide the structure of the Multi Layer Perceptron (MLP) network architecture such as the number of hidden layers and neurons (nodes) in each layer. The activation functions for each layer is also to be chosen at this stage. The unknown parameters to be estimated are the biases and weights. Many algorithms exist for determining the network parameters. In neural network literature the algorithms are called learning or teaching algorithms, in system identification they belong to parameter estimation algorithms [26]. The most well-known are back-propagation and Levenberg-Marquardt algorithms. Back-propagation is a gradient based algorithm, which has many variants. Levenberg-Marquardt is usually more efficient, but needs more computer memory. It is better to use the multilayer layer perceptron algorithm.

EEG is one of the most important sources of information for emotion classification. After extracting the desired features, these features are entropy of all five subbands i.e Delta, Theta, Alpha, Beta and Gamma, Variance of all subbands i.e. Delta, Theta, Alpha, Beta and Gamma and Power of all subbands i.e. Delta, Theta, Alpha, Beta and Gamma [6].for the signal obtained from Cz, Fz, C3, C4, P3 and P4 electrode of EEG standard 10-20 placement system.

In all, we have 30 parameters in terms of entropy, 30 parameters in terms of variance and 30 parameters in terms of power. For two state classification of emotion i.e. High Arousal and Low arousal, in first phase we experimented with five features at a time only say entropy of Delta, Theta, Alpha, Beta and Gamma subbands of electrode Cz. This is repeated for variance and power. In second phase we classified using 30 features

say entropy of Delta, Theta, Alpha, Beta and Gamma subbands from all electrodes Cz, Fz, C3, C4, P3 and P4 recognition of emotion is done by a suitable classifier.

Steps involved in this process are given below:

1. The input vector is created by taking five/thirty features. Target vector is created by taking 1 for HA and 0 for LA.
2. Create .Mat file of input vector and target vector with the help of MATLAB.
3. Load the input data and target data in neural network toolbox window.
4. Define the structure of the network, the activation functions, the network parameters. No. of hidden layers =3,
No. of neurons in both hidden layers=6
Neurons in output layer= 1
Training functions =trainlim
Transfer functions of both hidden layers=Tansig
Transfer functions of output layers=Purlin

Weights and biases initialize itself by the network.
5. Create a network Train the network with input and target values.
6. Error is computed from network_error.

As algorithm for calculation of percentage error is given below:

- i. Rounds of this error to an integer value i.e. 0.78 becomes 1 and 0.36 becomes 0, Obtained from network_error in error data window.
- ii. Square the rounded of values so that all the values become positive.
- iii. Add all the values.
- iv. Percentage error is calculated by multiplying sum by 100 and divide it by number of targets.
- v. Accuracy can be calculated by subtracting it from 100.

CHAPTER 5

RESULTS

5.1. TEST1: FEATURE EXTRACTION

Entropy is the 1st feature which is extracted from the EEG data. Here, 6 electrodes and 40 events: 20 for High arousal events and 20 for Low arousal events are chosen. Then, entropy is extracted for EEG data and is normalized by dividing each value of entropy in all bands by the sum of all band entropy data. So that results shown in table firstly HA table followed by LA table.

Table 5.1 Entropy in different bands of participant one 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2ND	10TH	20TH	4TH	9TH	5TH	23RD	6th	8th	19th
DratioT	0.0288	0.0427	0.2794	0.0733	0.1726	0.2255	0.0665	0.0651	0.1411	0.0649
TratioT	9.62E-04	0.0029	0.0013	0.0023	0.0011	0.0014	0.0029	0.0034	0.0038	0.0032
BratioT	0.0027	0.0051	0.0018	0.002	0.0033	0.0019	0.0057	0.0107	0.0074	0.0133
AratioT	0.0068	0.007	0.0052	0.0068	9.32E-04	0.003	0.0017	0.0081	0.004	0.0054
GratioT	0.9608	0.9424	0.7122	0.9156	0.8221	0.7683	0.9231	0.9128	0.8436	0.9132
FZ										
DratioT	0.1019	0.0631	0.0569	0.1178	0.2839	0.06	0.088	0.2033	0.287	0.1168
TratioT	0.002	0.0069	0.0081	0.0046	0.0035	0.0035	0.0054	0.0113	0.0093	0.0091
BratioT	0.0077	0.0175	0.013	0.0059	0.0073	0.0068	0.01	0.0321	0.0243	0.0342
AratioT	0.0053	0.008	0.0063	0.0064	0.0018	0.0052	0.002	0.009	0.0054	0.008
eGratioT	0.883	0.9046	0.9158	0.8653	0.7036	0.9244	0.8946	0.7442	0.6741	0.8318
C3										
DratioT	0.0974	0.0352	0.0756	0.1252	0.2527	0.0507	0.0593	0.09	0.2031	0.0224
TratioT	0.0025	0.0062	0.0063	0.0046	0.0033	0.0038	0.0055	0.0036	0.0025	0.0017
BratioT	0.0039	0.006	0.0065	0.004	0.0034	0.0041	0.0051	0.0097	0.0071	0.0082
AratioT	0.0063	0.0075	0.0066	0.0058	0.0012	0.0037	0.0014	0.0079	0.0027	0.0054

GratioT	0.8898	0.9451	0.9049	0.8603	0.7394	0.9377	0.9287	0.8888	0.7847	0.9622
C4										
DratioT	0.1615	0.113	0.3205	0.2109	0.0701	0.2309	0.1993	0.4057	0.1418	0.1862
TratioT	9.15E-04	0.0011	0.0021	0.002	0.0022	0.0022	0.003	0.0043	0.0093	0.0066
BratioT	0.0015	0.002	0.0045	0.0032	0.0054	0.0032	0.0055	0.0136	0.0187	0.0242
AratioT	0.0055	0.0065	0.0042	0.0059	0.002	0.0036	0.0011	0.0052	0.0058	0.0055
GratioT	0.8306	0.8774	0.6686	0.778	0.9203	0.76	0.7912	0.5712	0.8244	0.7775
P3										
DratioT	0.0444	0.0347	0.2137	0.1142	0.8347	0.4131	0.0889	0.2615	0.0573	0.2181
TratioT	0.0013	0.003	0.0011	0.0014	1.26E-04	5.50E-04	7.37E-04	8.10E-04	0.0016	7.50E-04
BratioT	0.0051	0.0107	0.0013	0.0012	1.34E-04	5.82E-04	6.88E-04	0.0024	0.0024	0.0011
AratioT	0.0058	0.0075	0.0048	0.0061	2.19E-04	0.0016	4.62E-04	0.0055	0.0024	0.0036
GratioT	0.9433	0.9441	0.7792	0.8771	0.1648	0.5842	0.9092	0.7298	0.9363	0.7764
P4										
DratioT	0.1105	0.4269	0.351	0.2796	0.398	0.3823	0.1987	0.0965	0.0934	0.1097
TratioT	0.0039	0.0037	0.0038	0.0034	0.003	0.0024	0.0064	0.002	0.0036	0.0042
BratioT	0.0034	0.0037	0.0057	0.0046	0.0025	0.0021	0.0069	0.0071	0.0087	0.0086
AratioT	0.007	0.0041	0.0054	0.0057	0.0011	0.002	0.002	0.0061	0.0031	0.0055
GratioT	0.8752	0.5617	0.6341	0.7067	0.5954	0.6112	0.786	0.8882	0.8912	0.8721

Table 5.2 Entropy in different bands of participant one next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
CZ	1 st	4 th	5 th	14 th	6 th	11 th	8 th	4 th	5 th	28 th
DratioT	0.3407	0.2854	0.2697	0.1311	0.9467	0.6742	0.8262	0.5571	0.9182	0.9622
TratioT	0.0024	0.0034	0.0047	0.0051	0.0062	0.0457	0.0267	0.0535	0.0082	0.005
BratioT	0.0046	0.0048	0.0134	0.0072	0.0084	0.0458	0.0352	0.0735	0.0206	0.0105
AratioT	0.0018	0.0034	0.006	0.0061	0.0045	0.0197	0.0081	0.0308	0.0054	0.0027
GratioT	0.6505	0.7029	0.7061	0.8505	0.0341	0.2146	0.1037	0.285	0.0476	0.0195

FZ										
DratioT	0.5746	0.2186	0.2223	0.3757	0.9129	0.9837	0.897	0.8733	0.7358	0.7631
TratioT	0.0035	0.0079	0.0139	0.0089	0.022	0.0039	0.0433	0.0154	0.0313	0.0324
BratioT	0.0104	0.0184	0.0367	0.0221	0.0288	0.0062	0.0043	0.0646	0.1546	0.1394
AratioT	0.002	0.0052	0.0069	0.0061	0.0064	0.0011	0.0464	0.0087	0.0205	0.0156
GratioT	0.4094	0.7499	0.7202	0.5872	0.0299	0.0051	0.0091	0.0379	0.0578	0.0495
C3										
DratioT	0.199	0.0384	0.0717	0.1802	0.8353	0.8815	0.8555	0.9667	0.8555	0.973
TratioT	0.0022	0.003	0.0049	0.004	0.0221	0.0168	0.0217	0.0033	0.017	0.0018
BratioT	0.0077	0.0057	0.0099	0.0072	0.0304	0.0186	0.0345	0.0073	0.0501	0.0056
AratioT	0.002	0.0031	0.0067	0.0056	0.0101	0.0074	0.0087	0.0018	0.0082	0.0013
GratioT	0.7891	0.9498	0.9069	0.8031	0.1021	0.0756	0.0796	0.0209	0.0692	0.0182
C4										
DratioT	0.2711	0.081	0.049	0.1526	0.8423	0.8821	0.8358	0.9852	0.8531	0.861
TratioT	0.004	0.0053	0.0083	0.0072	0.0483	0.0243	0.0405	0.0023	0.0205	0.0152
BratioT	0.0087	0.0154	0.024	0.0162	0.0465	0.0509	0.0801	0.0067	0.0761	0.0868
AratioT	0.0027	0.0062	0.0082	0.0068	0.0124	0.0085	0.0086	0.0013	0.0134	0.0087
GratioT	0.7135	0.8922	0.9105	0.8172	0.0506	0.0342	0.0351	0.0045	0.0369	0.0283
P3										
DratioT	0.1156	0.1008	0.25	0.0486	0.8437	0.9899	0.7946	0.8685	0.9762	0.9701
TratioT	8.57E-04	8.71E-04	0.0016	0.002	0.0126	0.0012	0.027	0.0178	0.0032	0.0034
BratioT	0.0022	0.0011	0.0012	0.0033	0.028	0.0016	0.0324	0.0248	0.0042	0.0047
AratioT	0.0019	0.0019	0.0051	0.0055	0.011	5.21E-04	0.0128	0.0065	0.0012	0.0019
GratioT	0.8794	0.8953	0.7421	0.9406	0.1046	0.0068	0.1332	0.0824	0.0153	0.0198
P4										
DratioT	0.4532	0.0803	0.0402	0.076	0.9263	0.9785	0.907	0.987	0.9155	0.8571
TratioT	0.0015	0.0033	0.0028	0.0034	0.0136	0.0047	0.0239	0.0022	0.0166	0.0246
BratioT	0.0032	0.0066	0.0084	0.01	0.0267	0.0082	0.0359	0.0046	0.0344	0.0806

AratioT	0.0015	0.0038	0.0088	0.0049	0.0081	0.0018	0.0069	0.0014	0.007	0.0086
GratioT										

Table 5.3 Entropy in different bands of participant one 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
CZ	21 ST	17 TH	19 TH	3 RD	6 TH	14 TH	18 TH	3 rd	7 th	20 th
DratioT	0.0276	0.2078	0.0631	0.0658	0.1395	0.0734	0.168	0.3761	0.4973	0.9234
TratioT	0.0033	0.0013	0.0022	0.001	0.0021	0.0022	9.39E-04	0.0289	0.0149	0.0033
BratioT	0.0056	0.0015	0.0059	0.0026	0.0028	0.0047	0.002	0.0108	0.0082	0.001
AratioT	0.0014	0.0021	0.0013	7.93E-04	0.0057	0.0024	0.0019	0.0358	0.0245	0.0043
GratioT	0.9622	0.7873	0.9275	0.9298	0.8499	0.9172	0.8271	0.5484	0.455	0.0679
Fz										
DratioT	0.0358	0.1352	0.0571	0.0467	0.0758	0.1522	0.0691	0.1443	0.0852	0.4627
TratioT	0.0062	0.0045	0.0105	0.0035	0.0041	0.006	0.0024	0.0125	0.0123	0.0093
BratioT	0.0172	0.0052	0.0177	0.0105	0.0074	0.0102	0.0091	0.0346	0.03	0.0265
AratioT	0.0015	0.0023	0.0016	0.0012	0.0068	0.0039	0.0018	0.0089	0.0085	0.0048
GratioT	0.9393	0.8528	0.913	0.9381	0.906	0.8276	0.9176	0.7996	0.8641	0.4967
C3										
DratioT	0.0595	0.1194	0.078	0.0835	0.1108	0.0824	0.1472	0.0385	0.1994	0.3489
TratioT	0.006	0.0038	0.0073	0.0035	0.0046	0.0049	0.003	0.0046	0.0031	0.0016
BratioT	0.0084	0.0032	0.0065	0.0037	0.0052	0.004	0.0036	0.0099	0.0076	0.0058
AratioT	0.0016	0.002	0.0014	0.001	0.0072	0.0028	0.0019	0.0079	0.0059	0.0039
GratioT	0.9244	0.8717	0.9068	0.9082	0.8722	0.9059	0.8443	0.9391	0.7841	0.6398
C4										
DratioT	0.2357	0.5413	0.1235	0.0439	0.3705	0.1435	0.4297	0.2417	0.0553	0.275
TratioT	0.0035	9.73E-04	0.0033	0.0017	0.001	8.16E-04	7.06E-04	0.0067	0.0067	0.0059
BratioT	0.006	0.0016	0.0099	0.0048	0.0011	6.69E-04	0.0031	0.0202	0.0151	0.0202
AratioT	7.67E-04	9.61E-04	8.34E-04	8.75E-04	0.0044	0.0019	7.30E-04	0.0077	0.0067	0.0046
GratioT	0.7541	0.4552	0.8625	0.9487	0.623	0.8531	0.5657	0.7237	0.9162	0.6944

P3										
DratioT	0.1732	0.2575	0.303	0.0532	0.2454	0.2319	0.5676	0.1418	0.2931	0.2818
TratioT	8.72E-04	2.81E-04	6.25E-04	6.97E-04	0.0016	0.0033	2.23E-04	0.001	9.51E-04	8.00E-04
BratioT	0.001	0.0011	8.98E-04	6.76E-04	0.0028	0.0054	4.32E-04	0.0015	0.0011	0.0017
AratioT	6.27E-04	8.86E-04	4.87E-04	5.24E-04	0.0056	0.0028	8.16E-04	0.0061	0.0053	0.0033
GratioT	0.8243	0.7402	0.6949	0.9449	0.7446	0.7566	0.4309	0.8495	0.6995	0.7124
P4										
DratioT	0.1463	0.1878	0.0958	0.1882	0.3821	0.0828	0.0936	0.0343	0.0231	0.3613
TratioT	0.008	0.004	0.0048	0.0034	0.0033	0.007	0.004	0.0041	0.0035	0.0023
BratioT	0.0072	0.0043	0.0066	0.0037	0.0028	0.0065	0.0054	0.0112	0.0074	0.0067
AratioT	0.0024	0.0027	0.0023	0.0012	0.0046	0.0026	0.0033	0.0084	0.0057	0.003
GratioT	0.8361	0.8012	0.8905	0.8035	0.6072	0.9011	0.8937	0.9421	0.9604	0.6266

Table 5.4 Entropy in different bands of participant one next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
CZ	9 th	10 th	13 th	16 th	1 st	3 rd	10 th	7 th	14 th	16 th
DratioT	0.6489	0.8279	0.7642	0.7469	0.9182	0.9108	0.8209	0.9766	0.9016	0.9089
TratioT	0.0133	0.008	0.0124	0.0124	0.0082	0.0098	0.0334	0.0019	0.0135	0.0142
BratioT	0.0069	0.002	0.0024	0.0038	0.0206	0.0187	0.03	0.0056	0.026	0.0182
AratioT	0.0143	0.01	0.0158	0.0126	0.0054	0.0046	0.0114	0.0012	0.0069	0.008
GratioT	0.3166	0.152	0.2053	0.2243	0.0476	0.0562	0.1044	0.0147	0.052	0.0507
FZ										
DratioT	0.1305	0.3514	0.4524	0.0983	0.7358	0.6007	0.9854	0.8521	0.9429	0.8691
TratioT	0.0087	0.0089	0.0107	9.31E-04	0.0313	0.0801	0.0039	0.0224	0.0119	0.0213
BratioT	0.0289	0.0342	0.0283	0.0018	0.1546	0.2152	0.0062	0.0718	0.0296	0.0672
AratioT	0.0099	0.0043	0.0037	0.0065	0.0205	0.0241	9.70E-04	0.0099	0.0034	0.0106
GratioT	0.8219	0.6012	0.5049	0.8924	0.0578	0.0799	0.0035	0.0438	0.0122	0.0318
C3										

DratioT	0.1068	0.4453	0.0367	0.0228	0.8555	0.8256	0.9661	0.6779	0.9758	0.884
TratioT	0.004	0.0023	0.0036	0.0052	0.017	0.0215	0.0061	0.0218	0.0025	0.0179
BratioT	0.011	0.0074	0.0143	0.0156	0.0501	0.0518	0.008	0.0721	0.0067	0.0267
AratioT	0.0081	0.0024	0.0028	0.006	0.0082	0.0091	0.002	0.0151	0.0012	0.0053
GratioT	0.8702	0.5425	0.9426	0.9504	0.0692	0.0919	0.0177	0.2131	0.0138	0.066
C4										
DratioT	0.2776	0.1457	0.2317	0.2947	0.8531	0.9184	0.9788	0.9835	0.9853	0.9588
TratioT	0.0069	0.0052	0.0089	0.0064	0.0205	0.0179	0.0059	0.0028	0.0032	0.0092
BratioT	0.0138	0.0238	0.0244	0.014	0.0761	0.0403	0.0079	0.0083	0.0073	0.0184
AratioT	0.0068	0.0047	0.0041	0.0057	0.0134	0.0055	0.002	0.0011	0.0011	0.0037
GratioT	0.6949	0.8206	0.7309	0.6791	0.0369	0.0179	0.0054	0.0043	0.0031	0.0099
P3										
DratioT	0.0477	0.0334	0.0823	0.1474	0.9762	0.9776	0.9842	0.9768	0.9772	0.9817
TratioT	0.0012	0.001	0.0017	0.0015	0.0032	0.0031	0.0024	0.0018	0.0031	0.0033
BratioT	0.003	0.0026	0.0026	0.0036	0.0042	0.004	0.0029	0.0025	0.0044	0.0025
AratioT	0.0073	0.0031	0.0018	0.0054	0.0012	0.001	0.0011	0.0015	0.0016	9.35E-04
GratioT	0.9409	0.9599	0.9116	0.842	0.0153	0.0142	0.0094	0.0173	0.0138	0.0115
P4										
DratioT	0.1225	0.0966	0.0479	0.1713	0.9155	0.9377	0.9793	0.9835	0.8443	0.9913
TratioT	0.0039	0.0025	0.0051	0.0022	0.0166	0.0094	0.0045	0.0025	0.0361	0.0018
BratioT	0.0085	0.0123	0.0136	0.0064	0.0344	0.029	0.0091	0.0087	0.0679	0.0036
AratioT	0.0069	0.0034	0.0024	0.007	0.007	0.0048	0.0024	0.0013	0.0146	8.20E-04
GratioT	0.8582	0.8851	0.931	0.813	0.0265	0.0191	0.0047	0.0041	0.037	0.0025

Table 5.5 Entropy in different bands of participant two 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2ND	10TH	20TH	4TH	9TH	5TH	23RD	6th	8th	19th
DratioT	0.5271	0.9606	0.9359	0.7441	0.8794	0.7238	0.7897	0.5027	0.6296	0.4862
TratioT	0.001	4.56E-04	1.42E-04	0.002	0.0014	0.0048	2.58E-04	0.0017	0.0012	0.0016

BratioT	0.0014	4.41E-04	2.46E-04	0.0072	0.0023	0.0053	3.78E-04	0.003	0.0027	0.0028
AratioT	0.0041	7.56E-04	3.23E-04	0.0034	0.0018	0.0046	7.98E-04	0.0025	0.0034	0.0055
GratioT	0.4664	0.0378	0.0634	0.2434	0.115	0.2615	0.2089	0.4901	0.3631	0.504
FZ										
DratioT	0.4835	0.7222	0.9033	0.9347	0.7916	0.7594	0.2018	0.5928	0.5504	0.293
TratioT	0.0045	0.0037	2.32E-04	0.001	0.0033	0.0042	0.0018	0.0028	0.0028	0.0063
BratioT	0.0033	0.0029	4.77E-04	0.0017	0.0044	0.0053	0.0018	0.0032	0.0059	0.0056
AratioT	0.0071	0.0064	5.26E-04	0.0015	0.0044	0.006	0.0047	0.0049	0.0062	0.0128
GratioT	0.5015	0.2647	0.0955	0.061	0.1963	0.2252	0.7899	0.3963	0.4346	0.6823
C3										
DratioT	0.8062	0.8908	0.9938	0.8375	0.659	0.7288	0.9523	0.9336	0.9543	0.7408
TratioT	0.0015	9.03E-04	8.60E-05	0.0011	0.0032	0.0036	6.74E-04	0.0055	0.0032	0.0154
BratioT	0.0014	8.93E-04	5.67E-05	0.0015	0.0048	0.0029	7.51E-04	0.0054	0.0042	0.0219
AratioT	0.003	0.0013	7.63E-05	0.0035	0.0033	0.0038	9.52E-04	0.0053	0.0027	0.0122
GratioT	0.1879	0.1061	0.006	0.1565	0.3298	0.2609	0.0454	0.0502	0.0355	0.2097
C4										
DratioT	0.5138	0.9667	0.9482	0.7964	0.8709	0.736	0.7431	0.4942	0.4598	0.7115
TratioT	0.0014	4.80E-04	1.60E-04	0.0021	0.0014	0.0045	4.70E-04	0.0038	0.0033	0.0017
BratioT	0.0014	6.17E-04	3.36E-04	0.0096	0.0048	0.0071	9.42E-04	0.0072	0.0081	0.0031
AratioT	0.0051	6.43E-04	3.39E-04	0.004	0.0026	0.0057	0.0012	0.0038	0.0064	0.0041
GratioT	0.4784	0.0315	0.051	0.1879	0.1203	0.2468	0.2543	0.491	0.5224	0.2795
P3										
DratioT	0.9505	0.9794	0.997	0.8624	0.8881	0.0936	0.953	0.9822	0.5172	0.9566
TratioT	8.65E-05	4.25E-05	2.00E-05	3.44E-04	4.01E-04	0.0028	2.69E-04	1.34E-04	0.006	0.0013
BratioT	2.37E-04	5.64E-05	1.66E-05	3.63E-04	3.65E-04	0.0031	1.37E-04	1.02E-04	0.0042	7.53E-04
AratioT	3.53E-04	1.07E-04	6.31E-06	3.21E-04	4.97E-04	0.0051	4.45E-05	8.80E-05	0.0048	5.32E-04
GratioT	0.0489	0.0204	0.003	0.1366	0.1106	0.8954	0.0465	0.0174	0.4678	0.0409
P4										
DratioT	0.5194	0.9708	0.9647	0.9383	0.8971	0.8686	0.6439	0.319	0.1423	0.8707

TratioT	7.46E-04	2.41E-04	6.24E-05	3.46E-04	9.28E-04	8.62E-04	6.88E-04	0.0014	0.0029	2.87E-04
BratioT	7.46E-04	5.08E-04	2.08E-04	0.0013	0.0028	0.0022	9.77E-04	0.0033	0.0048	6.67E-04
AratioT	0.0036	3.50E-04	1.31E-04	0.0012	0.002	0.0018	8.58E-04	0.0023	0.0077	0.0015
GratioT	0.4755	0.0281	0.0349	0.0588	0.0972	0.1266	0.3536	0.674	0.8424	0.1269

Table 5.6 Entropy in different bands of participant two next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1st	4th	5th	14th	6th	11th	8th	4th	5th	28th
DratioT	0.4969	0.8338	0.5898	0.5802	0.5295	0.7854	0.7255	0.7004	0.7026	0.9032
TratioT	0.004	6.80E-04	0.0012	0.0017	0.0133	0.0067	0.0074	0.0102	0.01	0.0067
BratioT	0.0038	0.0011	0.0022	0.0032	0.0119	0.004	0.007	0.0088	0.0052	0.0046
AratioT	0.0049	0.0011	0.0038	0.004	0.0121	0.0045	0.0084	0.0075	0.0054	0.0025
GratioT	0.4905	0.1633	0.403	0.4109	0.4333	0.1993	0.2516	0.2731	0.2767	0.083
FZ										
DratioT	0.7845	0.8245	0.3674	0.6128	0.5897	0.8077	0.9942	0.9106	0.85	0.9236
TratioT	0.0014	0.0011	0.0058	0.003	0.0224	0.0128	3.01E-04	0.0057	0.0096	0.0096
BratioT	0.002	0.002	0.006	0.0044	0.0175	0.007	2.91E-04	0.0048	0.0049	0.0054
AratioT	0.0032	0.0025	0.0097	0.0053	0.0154	0.0064	2.56E-04	0.003	0.0044	0.0028
GratioT	0.2089	0.1699	0.611	0.3745	0.355	0.1661	0.005	0.0759	0.1311	0.0587
C3										
DratioT	0.9887	0.9835	0.8806	0.9176	0.5236	0.4065	0.9467	0.8385	0.6262	0.6905
TratioT	0.001	0.0011	0.0068	0.0104	0.0766	0.0971	0.0087	0.028	0.0538	0.0836
BratioT	8.38E-04	0.0016	0.0101	0.0061	0.0583	0.0745	0.0068	0.0197	0.0457	0.0497
AratioT	5.04E-04	0.0018	0.0118	0.0046	0.0171	0.0225	0.0023	0.0042	0.0103	0.0145
GratioT	0.009	0.012	0.0906	0.0613	0.3244	0.3993	0.0355	0.1096	0.2641	0.1617
C4										
DratioT	0.6222	0.8133	0.4762	0.6388	0.7427	0.8244	0.9815	0.9056	0.8076	0.7423
TratioT	0.0033	0.001	0.0029	0.0028	0.0777	0.0524	0.0048	0.0276	0.0585	0.1112
BratioT	0.005	0.0024	0.0056	0.0064	0.0723	0.0447	0.0049	0.0278	0.0532	0.0703

AratioT	0.005	0.0015	0.0061	0.0042	0.017	0.0115	0.0014	0.0058	0.0096	0.0169
GratioT	0.3645	0.1818	0.5093	0.3479	0.0902	0.067	0.0073	0.0332	0.0712	0.0593
P3										
DratioT	0.9408	0.9939	0.7206	0.9574	0.9824	0.9363	0.9834	0.9822	0.9846	0.4791
TratioT	5.60E-04	9.42E-05	0.0035	9.21E-04	9.19E-05	0.001	1.13E-04	1.01E-04	7.47E-05	0.0085
BratioT	7.03E-04	7.21E-05	0.0029	8.58E-04	9.08E-05	2.91E-04	1.04E-04	8.26E-05	5.44E-05	0.0075
AratioT	3.78E-04	2.41E-05	0.0035	2.48E-04	6.78E-05	2.42E-04	8.10E-05	3.12E-05	1.58E-05	0.0032
GratioT	0.0576	0.0059	0.2695	0.0406	0.0174	0.0622	0.0163	0.0176	0.0153	0.5018
P4										
DratioT	0.6504	0.775	0.0396	0.5782	0.8395	0.9516	0.9593	0.9857	0.8888	0.9996
TratioT	9.57E-04	4.36E-04	0.0019	9.92E-04	0.0262	0.0079	0.0069	0.0024	0.0213	1.75E-04
BratioT	0.0022	0.002	0.0051	0.0044	0.0151	0.0047	0.0041	0.0022	0.0098	9.46E-05
AratioT	0.0033	9.65E-04	0.0063	0.0035	0.0059	0.002	0.002	7.32E-04	0.0036	2.75E-05
GratioT	0.343	0.2216	0.9471	0.4129	0.1133	0.0338	0.0277	0.009	0.0766	1.43E-04

Table 5.7 Entropy in different bands of participant two 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	6TH	14TH	18TH	21ST	17TH	19TH	3RD	3rd	7th	20th
DratioT	0.917	0.8019	0.9681	0.3489	0.1676	0.9377	0.4994	0.905	0.8139	0.383
TratioT	0.001	0.0016	5.71E-05	7.78E-04	0.0012	8.37E-05	0.0047	3.63E-04	0.0018	0.0038
BratioT	9.75E-04	0.0033	1.09E-04	0.0013	0.0015	1.07E-04	0.006	5.03E-04	0.0012	0.0033
AratioT	0.0013	0.0035	1.31E-04	0.0017	0.0028	1.39E-04	0.0079	9.93E-04	0.0022	0.0057
GratioT	0.0797	0.1897	0.0316	0.6473	0.827	0.0619	0.482	0.0931	0.1809	0.6042
FZ										
DratioT	0.4441	0.4428	0.9485	0.1119	0.1876	0.9016	0.2127	0.7545	0.2691	0.5421
TratioT	0.0101	0.0082	1.00E-04	0.0015	0.0017	1.70E-04	0.0134	0.0022	0.0059	0.0066
BratioT	0.0093	0.0098	2.04E-04	0.0023	0.0018	1.93E-04	0.0144	0.0024	0.0058	0.0052
AratioT	0.0119	0.014	2.83E-04	0.0034	0.0032	2.97E-04	0.0182	0.0043	0.0113	0.007
GratioT	0.5246	0.5253	0.0509	0.8809	0.8057	0.0977	0.7414	0.2365	0.708	0.4391

C3										
DratioT	0.4676	0.4985	0.9952	0.7505	0.6781	0.9947	0.6218	0.9908	0.9517	0.8503
TratioT	0.0053	0.0031	6.45E-05	0.0024	0.0031	6.32E-05	0.0043	7.57E-04	0.0127	0.0092
BratioT	0.0051	0.0049	6.85E-05	0.0041	0.0032	6.41E-05	0.005	0.0011	0.0062	0.0105
AratioT	0.0053	0.0068	5.93E-05	0.0026	0.0044	7.05E-05	0.0041	5.43E-04	0.0033	0.0088
GratioT	0.5167	0.4867	0.0046	0.2403	0.3111	0.0051	0.3648	0.0068	0.0262	0.1212
C4										
DratioT	0.904	0.8468	0.9744	0.3691	0.1517	0.955	0.6504	0.8386	0.8256	0.4092
TratioT	0.0011	0.002	5.25E-05	0.0012	0.0017	8.71E-05	0.0049	9.95E-04	0.0093	0.0064
BratioT	0.0025	0.0038	1.43E-04	0.0027	0.0024	1.57E-04	0.0069	0.0013	0.0057	0.0062
AratioT	0.002	0.0028	1.23E-04	0.0019	0.0036	1.22E-04	0.0058	0.0018	0.0036	0.0055
GratioT	0.0904	0.1447	0.0253	0.6251	0.8406	0.0446	0.3321	0.1573	0.1558	0.5726
P3										
DratioT	0.7652	0.8235	0.9983	0.1602	0.8911	0.9981	0.4405	0.9912	0.9753	0.9227
TratioT	4.25E-04	3.73E-04	1.38E-05	0.0042	9.93E-04	8.71E-06	0.0018	1.26E-04	0.0035	9.99E-04
BratioT	6.25E-04	4.60E-04	6.81E-06	0.0027	5.84E-04	6.24E-06	0.0019	1.02E-04	0.0012	9.32E-04
AratioT	0.0021	2.62E-04	3.02E-06	8.71E-04	3.05E-04	2.30E-06	0.0034	3.31E-05	3.58E-04	9.50E-04
GratioT	0.2317	0.1754	0.0017	0.8319	0.107	0.0019	0.5525	0.0085	0.0197	0.0744
P4										
DratioT	0.9093	0.8759	0.974	0.089	0.3863	0.9767	0.7079	0.6932	0.7313	0.5186
TratioT	5.31E-04	9.49E-04	2.88E-05	0.0018	8.69E-04	2.20E-05	0.0013	9.26E-04	0.0071	0.0019
BratioT	0.0017	0.0027	6.79E-05	0.0023	0.0011	6.30E-05	0.0026	0.0016	0.004	0.0036
AratioT	0.0016	0.0016	5.88E-05	0.0017	0.0024	3.67E-05	0.0021	0.0019	0.0042	0.0042
GratioT	0.0869	0.1189	0.0259	0.9052	0.6093	0.0232	0.286	0.3024	0.2535	0.4717

Table 5.8 Entropy in different bands of participant two next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9 th	10 th	13 th	16 th	1st	3rd	10th	7th	14th	16 th
DratioT	0.6782	0.517	0.4344	0.2884	0.7142	0.7698	0.5555	0.5918	0.3382	0.5517

TratioT	0.001	0.0015	0.003	0.0033	0.0057	0.0097	0.0151	0.0123	0.0475	0.0389
BratioT	0.004	0.0027	0.0048	0.0059	0.0051	0.0054	0.0112	0.0073	0.0474	0.0164
AratioT	0.0027	0.0022	0.0056	0.0078	0.0081	0.0047	0.0103	0.0095	0.0192	0.0139
GratioT	0.3141	0.4766	0.5521	0.6946	0.267	0.2105	0.408	0.3791	0.5477	0.379
Fz										
DratioT	0.49	0.5166	0.5475	0.606	0.9761	0.7547	0.9345	0.687	0.9674	0.9697
TratioT	0.0052	0.0044	0.0046	0.0049	9.76E-04	0.0154	0.0048	0.0265	0.0042	0.004
BratioT	0.0096	0.006	0.0053	0.006	4.63E-04	0.0086	0.0027	0.011	0.0028	0.0015
AratioT	0.0063	0.0052	0.0064	0.0062	9.38E-04	0.0076	0.0024	0.0121	0.0015	0.0013
GratioT	0.489	0.4679	0.4362	0.377	0.0216	0.2137	0.0556	0.2634	0.0242	0.0234
C3										
DratioT	0.9617	0.8844	0.8879	0.968	0.9346	0.3863	0.5528	0.5647	0.6967	0.3943
TratioT	0.0029	0.0116	0.0295	0.0018	0.0059	0.0916	0.1291	0.068	0.1085	0.2309
BratioT	0.0053	0.01	0.0157	0.0028	0.004	0.0714	0.055	0.0479	0.0655	0.1015
AratioT	0.0034	0.0093	0.0078	0.0024	0.0015	0.0169	0.0193	0.0184	0.0135	0.0346
GratioT	0.0267	0.0847	0.0591	0.025	0.054	0.4337	0.2437	0.301	0.1158	0.2387
C4										
DratioT	0.6354	0.5416	0.3652	0.3647	0.7741	0.6167	0.5979	0.6362	0.9268	0.6836
TratioT	0.0016	0.002	0.025	0.0051	0.0496	0.0911	0.1702	0.1039	0.0302	0.1563
BratioT	0.006	0.0049	0.0185	0.0085	0.046	0.1256	0.0946	0.0932	0.0235	0.0834
AratioT	0.0034	0.0028	0.0119	0.0079	0.0131	0.0203	0.0278	0.0237	0.0061	0.0243
GratioT	0.3536	0.4487	0.5795	0.6138	0.1173	0.1463	0.1096	0.143	0.0133	0.0524
P3										
DratioT	0.923	0.9359	0.9572	0.9529	0.9556	0.9503	0.8642	0.9818	0.9009	0.4791
TratioT	0.001	9.17E-04	0.0013	0.0017	1.22E-04	3.08E-04	0.0024	1.02E-04	0.0022	0.0085
BratioT	8.57E-04	0.001	5.63E-04	0.0014	1.79E-04	1.36E-04	9.67E-04	6.45E-05	0.0015	0.0075
AratioT	0.0011	4.09E-04	4.68E-04	4.37E-04	9.67E-05	1.04E-04	5.69E-04	4.27E-05	7.04E-04	0.0032

GratioT	0.074	0.0617	0.0405	0.0435	0.044	0.0492	0.1319	0.018	0.0947	0.5018
P4										
DratioT	0.2644	0.7554	0.3662	0.2497	0.8796	0.9825	0.9946	0.9614	0.9764	0.9533
TratioT	0.0023	6.00E-04	0.0089	0.0019	0.0118	0.003	0.0014	0.006	0.0079	0.0208
BratioT	0.0062	0.0015	0.0084	0.0054	0.007	0.0018	6.14E-04	0.0031	0.007	0.0083
AratioT	0.0053	0.001	0.0082	0.0069	0.0043	7.93E-04	2.49E-04	0.0017	0.0016	0.0035
GratioT	0.7219	0.2415	0.6084	0.7361	0.0973	0.0118	0.0031	0.0278	0.0071	0.014

Table 5.9 Entropy in different bands of participant three 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2 ND	10 TH	20 TH	4 TH	9 TH	5 TH	23 RD	6 th	8 th	19 th
DratioT	0.8843	0.3786	0.6294	0.8982	0.6582	0.7537	0.8662	0.856	0.8522	0.9939
TratioT	0.0042	0.0134	0.0191	0.0039	0.0127	0.0058	0.0081	0.0179	0.0139	6.17E-04
BratioT	0.0027	0.0184	0.0184	0.0033	0.0137	0.004	0.0046	0.0095	0.0112	6.63E-04
AratioT	0.0014	0.0075	0.0074	0.0013	0.0052	0.0038	0.0044	0.0065	0.0071	2.87E-04
GratioT	0.1074	0.5822	0.3257	0.0933	0.3101	0.2327	0.1167	0.1101	0.1156	0.0046
FZ										
DratioT	0.9493	0.7901	0.7821	0.9424	0.9252	0.9167	0.6615	0.9464	0.8354	0.9385
TratioT	0.0028	0.0136	0.0187	0.0041	0.0055	0.005	0.0306	0.0098	0.0222	0.0092
BratioT	0.002	0.0124	0.0239	0.0033	0.0052	0.0027	0.0206	0.0072	0.0192	0.0108
AratioT	0.0012	0.0044	0.008	0.0014	0.0017	0.0023	0.0139	0.0042	0.0123	0.0048
GratioT	0.0447	0.1796	0.1673	0.0487	0.0624	0.0733	0.2734	0.0325	0.1109	0.0366
C3										
DratioT	0.9025	0.419	0.5635	0.6329	0.6305	0.6034	0.5164	0.807	0.764	0.7018
TratioT	0.0015	0.0162	0.0188	0.0081	0.0114	0.0076	0.0206	0.0089	0.0095	0.0091
BratioT	0.0013	0.0093	0.0164	0.0072	0.0132	0.0049	0.014	0.0071	0.0107	0.0118
AratioT	0.0011	0.0043	0.0065	0.0028	0.0049	0.0038	0.0111	0.0046	0.0045	0.006
GratioT	0.0937	0.5513	0.3948	0.349	0.3401	0.3803	0.4379	0.1724	0.2115	0.2714
C4										

DratioT	0.8798	0.7212	0.5772	0.662	0.7602	0.3977	0.5838	0.9227	0.9806	0.7315
TratioT	0.0045	0.0082	0.0261	0.014	0.0076	0.0228	0.0194	0.0101	0.0028	0.0315
BratioT	0.0045	0.0108	0.0155	0.0131	0.0081	0.0219	0.0126	0.0072	0.0014	0.0262
AratioT	0.0017	0.0049	0.0168	0.0051	0.0046	0.0118	0.0117	0.0038	0.0012	0.0152
GratioT	0.1095	0.2548	0.3643	0.3059	0.2196	0.5458	0.3725	0.0561	0.014	0.1956
P3										
DratioT	0.9514	0.8189	0.5787	0.8537	0.9148	0.3417	0.3353	0.5247	0.4428	0.9438
TratioT	2.25E-04	8.71E-04	0.0041	4.22E-04	3.86E-04	0.0019	0.0028	0.0054	0.0075	6.84E-04
BratioT	2.14E-04	6.21E-04	0.0013	3.90E-04	2.94E-04	0.0016	0.0047	0.007	0.0069	4.78E-04
AratioT	3.13E-04	7.88E-04	0.0015	3.93E-04	6.35E-04	0.0017	0.0059	0.0047	0.005	5.18E-04
GratioT	0.0478	0.1788	0.4144	0.1451	0.0839	0.6531	0.6514	0.4582	0.5377	0.0546
P4										
DratioT	0.9727	0.9214	0.9425	0.8441	0.9093	0.2117	0.9297	0.9844	0.8507	0.969
TratioT	8.89E-04	0.0013	0.0025	0.0032	0.0023	0.0138	0.0024	0.0016	0.0086	0.0028
BratioT	5.97E-04	0.0018	0.0016	0.0039	0.0025	0.0152	0.0018	8.65E-04	0.0085	0.0021
AratioT	2.31E-04	0.0011	0.001	0.0016	0.001	0.0071	0.0016	7.36E-04	0.0062	0.0011
GratioT	0.0256	0.0744	0.0523	0.1472	0.0849	0.7521	0.0645	0.0125	0.126	0.025

Table 5.10 Entropy in different bands of participant three next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1 st	4 th	5 th	14 th	6 th	11 th	8 th	4 th	5 th	28 th
DratioT	0.9087	0.6956	0.9896	0.9928	0.9691	0.9648	0.859	0.9951	0.9949	0.9201
TratioT	0.0088	0.0255	0.0014	5.96E-04	0.0032	0.0062	0.0205	4.42E-04	3.92E-04	0.013
BratioT	0.007	0.0247	7.88E-04	7.20E-04	0.0034	0.0041	0.0131	3.47E-04	6.81E-04	0.0073
AratioT	0.0036	0.0121	4.41E-04	3.93E-04	0.0018	0.0021	0.0079	2.91E-04	2.57E-04	0.0066
GratioT	0.0719	0.2421	0.0077	0.0054	0.0226	0.0228	0.0995	0.0038	0.0038	0.053
FZ										
DratioT	0.8443	0.9039	0.9691	0.8959	0.9963	0.9458	0.9119	0.9919	0.9974	0.996
TratioT	0.0159	0.0168	0.0039	0.0165	4.71E-04	0.0118	0.0189	0.0017	3.09E-04	7.44E-04

BratioT	0.0207	0.0139	0.0046	0.0152	6.92E-04	0.0103	0.0145	0.0011	5.45E-04	6.79E-04
AratioT	0.0092	0.0062	0.0018	0.0096	4.54E-04	0.0052	0.0081	8.51E-04	2.84E-04	5.88E-04
GratioT	0.1099	0.0592	0.0206	0.0628	0.0021	0.0268	0.0466	0.0045	0.0014	0.002
C3										
DratioT	0.5715	0.5955	0.8873	0.9789	0.9215	0.9701	0.8587	0.9888	0.9941	0.9035
TratioT	0.0104	0.0106	0.0025	5.34E-04	0.0044	0.0014	0.0086	6.15E-04	2.98E-04	0.0044
BratioT	0.0143	0.0129	0.0031	6.48E-04	0.0043	0.0015	0.0068	3.41E-04	2.70E-04	0.0044
AratioT	0.0089	0.0062	0.002	4.41E-04	0.0024	0.0011	0.0047	4.28E-04	2.35E-04	0.0052
GratioT	0.3948	0.3749	0.1051	0.0195	0.0674	0.026	0.1212	0.0098	0.0051	0.0825
C4										
DratioT	0.8952	0.9611	0.8861	0.9931	0.9555	0.9226	0.8661	0.9912	0.9919	0.898
TratioT	0.0099	0.0043	0.0117	9.06E-04	0.0049	0.0116	0.0128	8.37E-04	8.30E-04	0.0121
BratioT	0.009	0.0038	0.0133	8.03E-04	0.0045	0.0102	0.0176	9.84E-04	0.0012	0.0121
AratioT	0.0042	0.0017	0.0057	4.89E-04	0.0032	0.0046	0.0114	7.62E-04	5.00E-04	0.0117
GratioT	0.0817	0.0291	0.0831	0.0047	0.0319	0.051	0.0921	0.0062	0.0056	0.0661
P3										
DratioT	0.9403	0.7927	0.9637	0.9742	0.9697	0.9743	0.9461	0.9913	0.9916	0.9529
TratioT	7.47E-04	0.0015	3.94E-04	2.83E-04	0.0015	7.51E-04	0.0012	2.38E-04	4.73E-04	0.0015
BratioT	7.09E-04	0.0027	2.50E-04	2.63E-04	3.95E-04	4.60E-04	7.85E-04	1.19E-04	1.19E-04	0.0011
AratioT	5.72E-04	0.0013	2.38E-04	2.17E-04	2.46E-04	3.52E-04	5.20E-04	1.11E-04	9.57E-05	0.0013
GratioT	0.0576	0.2018	0.0354	0.025	0.0282	0.0241	0.0515	0.0082	0.0077	0.0432
P4										
DratioT	0.9871	0.9618	0.9756	0.9832	0.9461	0.9622	0.8992	0.9933	0.9958	0.9111
TratioT	4.93E-04	0.0019	0.0021	8.33E-04	0.0062	0.0063	0.0079	4.21E-04	8.26E-04	0.008
BratioT	7.24E-04	0.0032	0.0031	9.33E-04	0.0043	0.004	0.0085	4.61E-04	3.61E-04	0.0076
AratioT	5.23E-04	0.0014	8.44E-04	6.67E-04	0.0031	0.0015	0.0056	3.22E-04	1.39E-04	0.008
GratioT	0.0111	0.0316	0.0183	0.0144	0.0404	0.026	0.0788	0.0055	0.0029	0.0652

Table 5.11 Entropy in different bands of participant three 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	6TH	14TH	18TH	21ST	17TH	19TH	3RD	3rd	7th	20th
DratioT	0.8579	0.6981	0.6607	0.9039	0.5971	0.6607	0.8986	0.9659	0.943	0.978
TratioT	0.0051	0.0136	0.0212	0.0038	0.0245	0.0212	0.0041	0.003	0.004	0.0017
BratioT	0.0039	0.0146	0.0124	0.0047	0.0116	0.0124	0.0031	0.0031	0.0065	0.0014
AratioT	0.0027	0.0062	0.0095	0.0021	0.0052	0.0095	0.0014	0.0015	0.0035	7.86E-04
GratioT	0.1304	0.2675	0.2963	0.0856	0.3616	0.2963	0.0928	0.0266	0.043	0.0181
FZ										
DratioT	0.9741	0.6842	0.7518	0.8324	0.909	0.7518	0.9403	0.9626	0.8473	0.7911
TratioT	0.0016	0.0262	0.0265	0.0145	0.0074	0.0265	0.0052	0.0057	0.0229	0.0261
BratioT	0.0017	0.0278	0.0191	0.0155	0.0047	0.0191	0.0046	0.0049	0.0206	0.0273
AratioT	8.82E-04	0.0107	0.0113	0.0056	0.0022	0.0113	0.0016	0.0024	0.0148	0.0149
GratioT	0.0218	0.2511	0.1912	0.1319	0.0767	0.1912	0.0483	0.0243	0.0944	0.1406
C3										
DratioT	0.8818	0.5071	0.7011	0.3034	0.6223	0.7011	0.6897	0.7891	0.9241	0.8053
TratioT	0.002	0.0198	0.0132	0.0252	0.0159	0.0132	0.0078	0.0061	0.0027	0.0042
BratioT	0.003	0.0138	0.0079	0.0232	0.0103	0.0079	0.007	0.0071	0.0025	0.0052
AratioT	0.0021	0.0088	0.0054	0.0119	0.0029	0.0054	0.0033	0.0042	0.0018	0.0038
GratioT	0.1111	0.4506	0.2724	0.6362	0.3486	0.2724	0.2922	0.1935	0.0689	0.1815
C4										
DratioT	0.9318	0.7298	0.8211	0.6995	0.5407	0.8211	0.8774	0.9803	0.9447	0.8721
TratioT	0.0024	0.0127	0.0113	0.0143	0.027	0.0113	0.0041	0.0029	0.0044	0.0094
BratioT	0.0029	0.017	0.01	0.0188	0.0115	0.01	0.0044	0.0017	0.0044	0.0091
AratioT	0.0015	0.0061	0.0048	0.0075	0.0088	0.0048	0.0023	9.59E-04	0.0041	0.0066
GratioT	0.0614	0.2344	0.1528	0.26	0.4119	0.1528	0.1118	0.0142	0.0423	0.1028
P3										
DratioT	0.9484	0.919	0.5355	0.6995	0.6814	0.5355	0.8915	0.984	0.9759	0.8649

TratioT	2.70E-04	3.50E-04	0.0024	0.0143	0.0014	0.0024	3.88E-04	1.28E-04	2.26E-04	0.0014
BratioT	2.52E-04	2.14E-04	0.002	0.0188	0.0012	0.002	3.33E-04	1.95E-04	2.24E-04	9.70E-04
AratioT	3.56E-04	7.72E-04	0.0037	0.0075	0.0013	0.0037	2.29E-04	1.00E-04	1.61E-04	7.29E-04
GratioT	0.0507	0.0797	0.4564	0.26	0.3147	0.4564	0.1075	0.0156	0.0234	0.132
P4										
DratioT	0.9635	0.783	0.7741	0.549	0.8999	0.7741	0.9614	0.9754	0.9908	0.9353
TratioT	9.57E-04	0.0055	0.0077	0.0214	0.0045	0.0077	8.22E-04	0.0015	4.72E-04	0.0039
BratioT	7.54E-04	0.0079	0.0102	0.0129	0.0028	0.0102	9.96E-04	0.0018	7.94E-04	0.0035
AratioT	4.12E-04	0.0036	0.0044	0.0089	0.0014	0.0044	4.18E-04	7.86E-04	3.03E-04	0.0016
GratioT	0.0344	0.2	0.2036	0.4077	0.0914	0.2036	0.0364	0.0205	0.0077	0.0556

Table 5.12 Entropy in different bands of participant three next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9 th	10 th	13 th	16 th	1 st	3 rd	10 th	7 th	14 th	16 th
DratioT	0.9051	0.9766	0.8617	0.9012	0.93	0.9798	0.9601	0.9936	0.8685	0.8233
TratioT	0.0118	0.0018	0.0166	0.011	0.0084	0.0019	0.0053	9.04E-04	0.0186	0.0276
BratioT	0.0096	0.0022	0.0108	0.0079	0.0031	0.0017	0.0052	6.06E-04	0.0151	0.0163
AratioT	0.0037	9.72E-04	0.006	0.004	0.0046	0.001	0.0018	3.68E-04	0.0087	0.0115
GratioT	0.0698	0.0185	0.1048	0.0759	0.0538	0.0155	0.0276	0.0045	0.0891	0.1213
FZ										
DratioT	0.9477	0.9417	0.8657	0.5891	0.9518	0.9843	0.9425	0.9926	0.9042	0.9656
TratioT	0.0115	0.0072	0.0286	0.0825	0.0103	0.0023	0.0073	0.0015	0.0184	0.009
BratioT	0.0085	0.0087	0.0156	0.0663	0.0044	0.0025	0.0097	0.0012	0.0167	0.0042
AratioT	0.0028	0.0044	0.0087	0.0261	0.005	0.0014	0.0062	6.71E-04	0.0129	0.0045
GratioT	0.0296	0.038	0.0814	0.236	0.0284	0.0095	0.0343	0.004	0.0477	0.0167
C3										
DratioT	0.9133	0.9774	0.8945	0.8886	0.7528	0.9738	0.9301	0.993	0.7832	0.9028
TratioT	0.0072	5.56E-04	0.0043	0.0048	0.0098	9.54E-04	0.0027	3.96E-04	0.0089	0.0062
BratioT	0.0041	0.0011	0.0041	0.0042	0.0079	0.0013	0.0025	3.33E-04	0.0107	0.0026

AratioT	0.0021	4.51E-04	0.0017	0.0023	0.0084	6.46E-04	0.0021	2.64E-04	0.0085	0.0033
GratioT	0.0733	0.0205	0.0953	0.1001	0.2211	0.0233	0.0627	0.006	0.1888	0.0851
C4										
DratioT	0.9732	0.9848	0.898	0.4989	0.8882	0.9727	0.97	0.9975	0.7059	0.9172
TratioT	0.0028	0.0011	0.0126	0.06	0.0147	0.0026	0.005	3.15E-04	0.0279	0.0105
BratioT	0.0036	0.0017	0.0117	0.0582	0.0082	0.0019	0.0034	2.31E-04	0.0356	0.0085
AratioT	0.0014	8.12E-04	0.0053	0.0257	0.0114	0.0015	0.0019	1.97E-04	0.024	0.0057
GratioT	0.019	0.0117	0.0724	0.3572	0.0776	0.0213	0.0196	0.0018	0.2066	0.0581
P3										
DratioT	0.8808	0.9836	0.8745	0.9205	0.8523	0.9654	0.9687	0.9943	0.9788	0.9021
TratioT	0.0011	2.28E-04	0.001	9.55E-04	0.0032	0.0011	6.51E-04	8.28E-05	3.53E-04	0.0023
BratioT	0.0021	2.15E-04	0.0012	0.0013	0.0019	4.31E-04	4.22E-04	8.74E-05	4.55E-04	0.0018
AratioT	0.0016	1.13E-04	0.001	9.03E-04	0.0018	4.56E-04	2.94E-04	6.35E-05	2.05E-04	0.0014
GratioT	0.1144	0.0158	0.1222	0.0763	0.1408	0.0327	0.0299	0.0054	0.0202	0.0924
P4										
DratioT	0.9798	0.9304	0.9571	0.8866	0.9484	0.9786	0.9605	0.9952	0.8576	0.8222
TratioT	9.12E-04	0.0049	0.002	0.0061	0.0029	0.0016	0.0049	4.60E-04	0.0192	0.0247
BratioT	0.0013	0.0039	0.0037	0.0062	0.0039	0.0019	0.0043	4.68E-04	0.0137	0.0234
AratioT	6.45E-04	0.0026	0.0014	0.0043	0.0024	9.53E-04	0.0018	2.52E-04	0.0065	0.007
GratioT	0.0173	0.0581	0.0358	0.0968	0.0424	0.017	0.0285	0.0036	0.103	0.1227

Table 5.13 Entropy in different bands of participant four 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2ND	10TH	20TH	4TH	9TH	5TH	23RD	6th	8th	19th
DratioT	0.9995	0.9995	0.995	0.999	0.9975	0.9984	0.9977	0.8988	0.9976	0.9901
TratioT	1.48E-04	1.56E-04	0.0014	3.60E-04	0.0011	3.53E-04	5.32E-04	0.032	9.82E-04	0.0046
BratioT	2.07E-04	2.28E-04	0.0019	3.97E-04	8.21E-04	8.07E-04	9.59E-04	0.0456	9.20E-04	0.003
AratioT	5.93E-05	7.44E-05	6.52E-04	1.21E-04	2.86E-04	1.64E-04	4.45E-04	0.0075	1.96E-04	7.32E-04
GratioT	4.49E-05	6.65E-05	9.80E-04	1.38E-04	2.58E-04	2.59E-04	3.75E-04	0.0161	3.14E-04	0.0016

FZ										
DratioT	0.9997	0.9985	0.9992	0.9967	0.9732	0.9821	0.9992	0.994	0.9981	0.988
TratioT	1.14E-04	5.86E-04	2.18E-04	0.0011	0.0137	0.0055	2.48E-04	0.0023	8.17E-04	0.0055
BratioT	1.19E-04	7.21E-04	3.06E-04	0.0014	0.0081	0.0086	3.65E-04	0.0024	7.24E-04	0.004
AratioT	1.76E-05	1.18E-04	8.82E-05	3.20E-04	0.0023	0.0015	6.83E-05	4.15E-04	1.30E-04	9.07E-04
GratioT	2.51E-05	1.24E-04	1.47E-04	4.99E-04	0.0027	0.0023	1.15E-04	8.58E-04	2.53E-04	0.0016
C3										
DratioT	0.9996	0.9973	0.9981	0.9981	0.9608	0.9993	0.9972	0.9985	0.9983	0.958
TratioT	8.29E-05	9.20E-04	5.38E-04	5.38E-04	0.0197	1.39E-04	4.65E-04	5.72E-04	5.61E-04	0.0173
BratioT	1.36E-04	9.65E-04	6.68E-04	6.68E-04	0.0093	3.59E-04	0.0014	5.26E-04	8.00E-04	0.0156
AratioT	4.83E-05	2.82E-04	2.02E-04	2.02E-04	0.0037	7.97E-05	4.01E-04	1.53E-04	1.43E-04	0.004
GratioT	1.09E-04	5.28E-04	4.81E-04	4.81E-04	0.0065	1.44E-04	5.56E-04	2.17E-04	2.05E-04	0.005
C4										
DratioT	0.9805	0.9786	0.9951	0.9972	0.9829	0.9968	0.9972	0.9896	0.8895	0.9214
TratioT	0.0079	0.009	9.57E-04	5.94E-04	0.0071	0.001	8.95E-04	0.003	0.045	0.0322
BratioT	0.009	0.0088	0.0025	0.0015	0.0069	0.0013	0.0013	0.0046	0.052	0.0354
AratioT	0.0015	0.0018	6.09E-04	3.57E-04	0.0015	3.58E-04	2.58E-04	0.001	0.0069	0.005
GratioT	0.0011	0.0019	8.03E-04	3.26E-04	0.0016	4.68E-04	3.64E-04	0.0018	0.0066	0.0059
P3										
DratioT	0.9997	0.9999	0.9985	0.9996	0.9978	0.9993	0.9984	0.9984	0.9994	0.9985
TratioT	5.55E-05	3.70E-05	1.94E-04	1.27E-04	8.17E-04	1.86E-04	2.74E-04	2.74E-04	8.32E-05	3.97E-04
BratioT	5.65E-05	3.54E-05	2.95E-04	8.92E-05	3.86E-04	1.07E-04	3.90E-04	3.90E-04	1.55E-04	2.63E-04
AratioT	1.44E-05	5.19E-06	8.60E-05	1.92E-05	1.28E-04	4.49E-05	7.10E-05	7.10E-05	3.54E-05	8.29E-05
GratioT	1.41E-04	4.53E-05	9.54E-04	1.85E-04	8.69E-04	3.84E-04	8.19E-04	8.19E-04	3.35E-04	7.61E-04
P4										
DratioT	0.4431	0.3726	0.3733	0.5029	0.1647	0.3781	0.0627	0.0381	0.56	0.1721
TratioT	7.49E-04	7.52E-04	6.37E-04	5.77E-04	3.68E-04	5.40E-04	0.0012	0.0013	6.80E-04	3.18E-04
BratioT	9.86E-04	6.49E-04	6.09E-04	7.49E-04	4.04E-04	3.39E-04	6.66E-04	7.43E-04	3.96E-04	4.72E-04
AratioT	0.0034	0.0039	0.0042	0.0035	0.0011	0.0026	0.0031	0.006	0.0025	4.36E-04
GratioT	0.5518	0.6221	0.6212	0.4923	0.8335	0.6184	0.9323	0.9539	0.4365	0.8266

Table 5.14 Entropy in different bands of participant four next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1st	4th	5th	14th	6th	11th	8th	4th	5th	28th
DratioT	0.9842	0.9286	0.9883	0.9831	0.282	0.6197	0.6482	0.9286	0.7974	0.9565
TratioT	0.0052	2.09E-04	0.0048	0.0095	0.0024	0.0012	0.0026	2.09E-04	0.0013	5.97E-04
BratioT	0.007	2.47E-04	0.0049	0.0051	0.0024	0.0016	0.0023	2.47E-04	0.001	5.19E-04
AratioT	0.0013	1.03E-04	7.35E-04	9.96E-04	0.0038	7.93E-04	0.0017	1.03E-04	0.0011	3.12E-04
GratioT	0.0024	0.0708	0.0013	0.0012	0.7095	0.3767	0.3452	0.0708	0.1992	0.042
FZ										
DratioT	0.9972	0.9922	0.9989	0.9816	0.8211	0.9134	0.5675	0.9922	0.4252	0.8019
TratioT	9.51E-04	7.01E-05	5.13E-04	0.0103	0.0017	7.78E-04	0.0089	7.01E-05	0.0129	0.0081
BratioT	0.0013	9.32E-05	4.02E-04	0.0063	0.0021	8.80E-04	0.0081	9.32E-05	0.0106	0.0092
AratioT	1.98E-04	2.59E-05	5.13E-05	8.17E-04	9.41E-04	2.73E-04	0.0026	2.59E-05	0.004	0.002
GratioT	3.47E-04	0.0076	9.00E-05	8.84E-04	0.1742	0.0846	0.4129	0.0076	0.5473	0.1788
C3										
DratioT	0.9685	0.9606	0.9987	0.9931	0.1481	0.876	0.4955	0.9606	0.1869	0.769
TratioT	0.0085	8.24E-05	6.34E-04	0.0028	0.0025	3.26E-04	0.0054	8.24E-05	0.0065	0.0067
BratioT	0.0152	1.13E-04	4.25E-04	0.0031	0.0034	4.80E-04	0.0051	1.13E-04	0.0039	0.0041
AratioT	0.0027	7.00E-05	8.37E-05	4.59E-04	0.0049	2.86E-04	0.0022	7.00E-05	0.0039	0.0018
GratioT	0.005	0.0392	1.15E-04	4.76E-04	0.8412	0.1229	0.4917	0.0392	0.7987	0.2184
C4										
DratioT	0.9363	0.98	0.9923	0.981	0.1839	0.9578	0.4955	0.98	0.7296	0.7474
TratioT	0.0261	1.03E-04	0.0033	0.0106	0.0047	1.57E-04	0.0054	1.03E-04	0.0031	0.0221
BratioT	0.0285	1.26E-04	0.0034	0.0062	0.0051	2.54E-04	0.0051	1.26E-04	0.0024	0.0113
AratioT	0.004	3.43E-05	5.22E-04	0.0012	0.0047	9.25E-05	0.0022	3.43E-05	0.0017	0.003
GratioT	0.0051	0.0198	4.86E-04	0.001	0.8016	0.0417	0.4917	0.0198	0.2632	0.2162
P3										
DratioT	0.9982	0.1812	0.9971	0.9986	0.0732	0.7915	0.5419	0.1812	0.3602	0.5634
TratioT	3.11E-04	0.001	9.09E-04	5.15E-04	0.0012	1.58E-04	8.88E-04	0.001	0.0012	0.0016

BratioT	4.44E-04	9.84E-04	6.27E-04	3.37E-04	0.0013	2.14E-04	6.07E-04	9.84E-04	9.83E-04	6.72E-04
AratioT	1.51E-04	0.0015	1.04E-04	6.01E-05	0.0051	5.50E-04	0.0017	0.0015	0.003	0.0022
GratioT	8.98E-04	0.8153	0.0012	5.29E-04	0.9192	0.2075	0.4549	0.8153	0.6346	0.4321
P4										
DratioT	0.3228	0.9324	0.1732	0.4851	0.4848	0.6732	0.4801	0.9324	0.7296	0.9677
TratioT	4.20E-04	2.92E-04	6.07E-04	5.87E-04	0.0012	7.10E-04	0.003	2.92E-04	0.0016	8.23E-04
BratioT	5.26E-04	2.10E-04	6.11E-04	3.45E-04	0.0013	9.50E-04	0.0021	2.10E-04	0.0014	2.85E-04
AratioT	9.03E-04	1.27E-04	0.0019	7.54E-04	0.0031	7.97E-04	0.0021	1.27E-04	0.0014	1.88E-04
GratioT	0.6753	0.0669	0.8237	0.5132	0.5095	0.3243	0.5126	0.0669	0.266	0.031

Table 5.15 Entropy in different bands of participant four 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	6TH	14TH	18TH	21ST	17TH	19TH	3RD	3rd	7th	20th
DratioT	0.9841	0.9895	0.9924	0.9926	0.9895	0.9907	0.9974	0.9853	0.9842	0.9757
TratioT	0.006	0.004	0.0024	0.0039	0.0054	0.0036	9.99E-04	0.0054	0.0068	0.0148
BratioT	0.0065	0.0044	0.0034	0.0024	0.0036	0.0035	0.0012	0.0068	0.0065	0.0064
AratioT	0.0016	9.06E-04	6.95E-04	5.18E-04	6.96E-04	9.11E-04	2.31E-04	0.0011	0.0013	0.0013
GratioT	0.0018	0.0012	0.0011	6.51E-04	7.42E-04	0.0014	1.72E-04	0.0014	0.0013	0.0018
FZ										
DratioT	0.9977	0.9947	0.9976	0.965	0.9963	0.9972	0.9925	0.9919	0.9798	0.9642
TratioT	0.001	0.0023	6.79E-04	0.0185	0.0023	0.0015	0.0028	0.0035	0.0095	0.0211
BratioT	8.70E-04	0.0022	0.0013	0.012	0.001	8.71E-04	0.0036	0.0037	0.0082	0.0108
AratioT	1.41E-04	3.55E-04	1.83E-04	0.002	1.32E-04	1.63E-04	5.87E-04	3.98E-04	9.71E-04	0.0014
GratioT	2.22E-04	5.00E-04	2.52E-04	0.0026	2.02E-04	2.87E-04	5.79E-04	5.57E-04	0.0015	0.0026
C3										
DratioT	0.9738	0.9652	0.9962	0.9489	0.9914	0.9634	0.989	0.8752	0.9974	0.9765
TratioT	0.0095	0.0159	7.09E-04	0.0255	0.0037	0.0164	0.0031	0.0585	8.75E-04	0.0122
BratioT	0.0098	0.0104	0.002	0.0169	0.0032	0.0116	0.0042	0.0502	0.0011	0.0077
AratioT	0.0021	0.0026	3.34E-04	0.0032	5.68E-04	0.0025	0.0015	0.0075	2.55E-04	0.0016

GratioT	0.0048	0.0059	7.07E-04	0.0055	0.0011	0.0061	0.0021	0.0086	2.90E-04	0.002
C4										
DratioT	0.9779	0.9736	0.9598	0.9737	0.9759	0.9494	0.9816	0.9532	0.9642	0.9626
TratioT	0.0109	0.0114	0.0144	0.0134	0.0138	0.0187	0.0056	0.0207	0.016	0.0189
BratioT	0.007	0.0109	0.0176	0.0086	0.0077	0.0217	0.0094	0.02	0.0159	0.0144
AratioT	0.0019	0.0018	0.0036	0.0021	0.0013	0.0048	0.0021	0.0031	0.0025	0.0022
GratioT	0.0022	0.0024	0.0047	0.0022	0.0013	0.0054	0.0012	0.003	0.0015	0.0019
P3										
DratioT	0.9991	0.9986	0.9905	0.9978	0.9978	0.999	0.9988	0.998	0.9994	0.998
TratioT	2.97E-04	4.80E-04	0.0018	7.67E-04	5.94E-04	1.77E-04	3.12E-04	7.91E-04	1.15E-04	6.40E-04
BratioT	1.30E-04	2.71E-04	0.0022	3.91E-04	6.54E-04	1.98E-04	3.06E-04	3.90E-04	1.46E-04	3.46E-04
AratioT	2.79E-05	5.64E-05	4.04E-04	1.39E-04	9.76E-05	3.43E-05	5.31E-05	7.59E-05	3.26E-05	1.10E-04
GratioT	4.47E-04	5.89E-04	0.0051	9.01E-04	8.38E-04	6.35E-04	5.66E-04	7.88E-04	3.02E-04	8.99E-04
P4										
DratioT	0.0886	0.3023	0.2567	0.0914	0.267	0.1769	0.1833	0.119	0.1053	0.1145
TratioT	5.72E-04	4.21E-04	8.84E-04	8.69E-04	4.96E-04	7.36E-04	7.50E-04	6.55E-04	0.0012	0.0012
BratioT	0.0011	2.90E-04	0.0012	8.06E-04	3.33E-04	5.34E-04	5.32E-04	6.90E-04	6.87E-04	9.56E-04
AratioT	0.0037	2.70E-04	0.0058	0.0022	6.60E-04	0.0015	0.0014	0.0021	0.0026	0.0047
GratioT	0.906	0.6968	0.7354	0.9047	0.7315	0.8204	0.8141	0.8775	0.8902	0.8786

Table 5.16 Entropy in different bands of participant four next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9th	10th	13th	16th	1st	3rd	10th	7th	14th	16th
DratioT	0.9791	0.9896	0.9837	0.9842	0.7699	0.4591	0.5656	0.9573	0.9863	0.2857
TratioT	0.0077	0.0064	0.0034	0.0052	6.63E-04	0.0034	0.0019	2.90E-04	1.48E-04	0.0067
BratioT	0.0093	0.003	0.0083	0.007	7.06E-04	0.0043	0.0037	4.01E-04	1.56E-04	0.0048
AratioT	0.0016	4.20E-04	0.0013	0.0013	0.0019	0.0011	0.0027	2.66E-04	6.94E-05	0.0029
GratioT	0.0022	5.43E-04	0.0033	0.0024	0.2269	0.5321	0.426	0.0417	0.0133	0.7
FZ										

DratioT	0.9947	0.9936	0.9961	0.9972	0.9663	0.2812	0.6342	0.9115	0.9384	0.8479
TratioT	0.0018	0.0042	0.0012	9.51E-04	2.40E-04	0.0115	0.0045	0.0014	0.0025	0.0042
BratioT	0.0026	0.0017	0.0017	0.0013	3.04E-04	0.0195	0.0114	0.0026	0.0022	0.0042
AratioT	3.38E-04	1.93E-04	2.82E-04	1.98E-04	3.16E-04	0.0033	0.003	7.24E-04	5.99E-04	7.39E-04
GratioT	5.20E-04	2.82E-04	7.25E-04	3.47E-04	0.0328	0.6845	0.3468	0.0837	0.0563	0.143
C3										
DratioT	0.986	0.9964	0.9507	0.9685	0.8866	0.7853	0.6775	0.8147	0.8219	0.8053
TratioT	0.0047	0.0019	0.0166	0.0085	3.30E-04	0.001	0.001	6.90E-04	0.0022	0.0017
BratioT	0.0072	0.0013	0.0157	0.0152	2.77E-04	0.0014	0.002	0.0013	0.0019	0.0017
AratioT	0.001	1.41E-04	0.0037	0.0027	7.16E-04	2.72E-04	0.0011	0.001	6.35E-04	9.34E-04
GratioT	0.0012	1.83E-04	0.0133	0.005	0.1121	0.212	0.3184	0.1823	0.1734	0.1903
C4										
DratioT	0.9898	0.9843	0.9468	0.9363	0.9694	0.6762	0.8632	0.8478	0.4932	0.8912
TratioT	0.0037	0.0101	0.007	0.0261	1.20E-04	0.0031	7.65E-04	9.91E-04	0.0114	0.0034
BratioT	0.0052	0.0044	0.0124	0.0285	1.48E-04	0.0046	0.0021	0.002	0.0098	0.0018
AratioT	7.36E-04	6.78E-04	0.008	0.004	2.60E-04	8.71E-04	9.50E-04	0.0011	0.0031	6.09E-04
GratioT	6.13E-04	5.12E-04	0.0257	0.0051	0.0301	0.3152	0.133	0.1482	0.4826	0.103
P3										
DratioT	0.9997	0.9981	0.9995	0.9982	0.5534	0.6488	0.1258	0.8499	0.8935	0.1069
TratioT	4.22E-05	7.02E-04	1.24E-04	3.11E-04	6.79E-04	4.57E-04	0.0013	2.33E-04	3.00E-04	0.0014
BratioT	7.85E-05	5.06E-04	9.34E-05	4.44E-04	4.47E-04	2.93E-04	0.001	2.23E-04	1.83E-04	0.0012
AratioT	1.74E-05	8.06E-05	2.95E-05	1.51E-04	0.0026	1.93E-04	0.0025	7.72E-04	2.47E-04	0.0042
GratioT	1.39E-04	6.58E-04	2.94E-04	8.98E-04	0.4429	0.3502	0.8694	0.1488	0.1058	0.8864
P4										
DratioT	0.2559	0.1921	0.3661	0.3228	0.6416	0.7155	0.6484	0.9197	0.428	0.953
TratioT	8.53E-04	0.0011	3.75E-04	4.20E-04	0.0013	7.90E-04	0.0013	3.59E-04	0.0039	7.40E-04
BratioT	9.04E-04	8.96E-04	6.95E-04	5.26E-04	0.0011	0.0014	0.0013	2.64E-04	0.0043	1.97E-04
AratioT	0.0049	0.0013	0.0012	9.03E-04	0.0026	4.25E-04	0.0014	4.91E-04	0.0016	2.55E-04
GratioT	0.7375	0.8047	0.6316	0.6753	0.3534	0.2819	0.3476	0.0792	0.5621	0.0458

Table 5.17 Variance in different bands of participant one 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2ND	10TH	20TH	4TH	9TH	5TH	23RD	6th	8th	19th
DratioT	0.0288	0.0427	0.2794	0.0733	0.1726	0.2255	0.0665	0.0651	0.1411	0.0649
TratioT	9.62E-04	0.0029	0.0013	0.0023	0.0011	0.0014	0.0029	0.0034	0.0038	0.0032
BratioT	0.0027	0.0051	0.0018	0.002	0.0033	0.0019	0.0057	0.0107	0.0074	0.0133
AratioT	0.0068	0.007	0.0052	0.0068	9.32E-04	0.003	0.0017	0.0081	0.004	0.0054
GratioT	0.9608	0.9424	0.7122	0.9156	0.8221	0.7683	0.9231	0.9128	0.8436	0.9132
FZ										
DratioT	0.1019	0.0631	0.0569	0.1178	0.2839	0.06	0.088	0.2033	0.287	0.1168
TratioT	0.002	0.0069	0.0081	0.0046	0.0035	0.0035	0.0054	0.0113	0.0093	0.0091
BratioT	0.0077	0.0175	0.013	0.0059	0.0073	0.0068	0.01	0.0321	0.0243	0.0342
AratioT	0.0053	0.008	0.0063	0.0064	0.0018	0.0052	0.002	0.009	0.0054	0.008
GratioT	0.883	0.9046	0.9158	0.8653	0.7036	0.9244	0.8946	0.7442	0.6741	0.8318
C3										
DratioT	0.0974	0.0352	0.0756	0.1252	0.2527	0.0507	0.0593	0.09	0.2031	0.0224
TratioT	0.0025	0.0062	0.0063	0.0046	0.0033	0.0038	0.0055	0.0036	0.0025	0.0017
BratioT	0.0039	0.006	0.0065	0.004	0.0034	0.0041	0.0051	0.0097	0.0071	0.0082
AratioT	0.0063	0.0075	0.0066	0.0058	0.0012	0.0037	0.0014	0.0079	0.0027	0.0054
GratioT	0.8898	0.9451	0.9049	0.8603	0.7394	0.9377	0.9287	0.8888	0.7847	0.9622
C4										
DratioT	0.1615	0.113	0.3205	0.2109	0.0701	0.2309	0.1993	0.4057	0.1418	0.1862
TratioT	9.15E-04	0.0011	0.0021	0.002	0.0022	0.0022	0.003	0.0043	0.0093	0.0066
BratioT	0.0015	0.002	0.0045	0.0032	0.0054	0.0032	0.0055	0.0136	0.0187	0.0242
AratioT	0.0055	0.0065	0.0042	0.0059	0.002	0.0036	0.0011	0.0052	0.0058	0.0055
GratioT	0.8306	0.8774	0.6686	0.778	0.9203	0.76	0.7912	0.5712	0.8244	0.7775
P3										
DratioT	0.0444	0.0347	0.2137	0.1142	0.8347	0.4131	0.0889	0.2615	0.0573	0.2181
TratioT	0.0013	0.003	0.0011	0.0014	1.26E-04	5.50E-04	7.37E-04	8.10E-04	0.0016	7.50E-04

BratioT	0.0051	0.0107	0.0013	0.0012	1.34E-04	5.82E-04	6.88E-04	0.0024	0.0024	0.0011
AratioT	0.0058	0.0075	0.0048	0.0061	2.19E-04	0.0016	4.62E-04	0.0055	0.0024	0.0036
GratioT	0.9433	0.9441	0.7792	0.8771	0.1648	0.5842	0.9092	0.7298	0.9363	0.7764
P4										
DratioT	0.1105	0.4269	0.351	0.2796	0.398	0.3823	0.1987	0.0965	0.0934	0.1097
TratioT	0.0039	0.0037	0.0038	0.0034	0.003	0.0024	0.0064	0.002	0.0036	0.0042
BratioT	0.0034	0.0037	0.0057	0.0046	0.0025	0.0021	0.0069	0.0071	0.0087	0.0086
AratioT	0.007	0.0041	0.0054	0.0057	0.0011	0.002	0.002	0.0061	0.0031	0.0055
GratioT	0.8752	0.5617	0.6341	0.7067	0.5954	0.6112	0.786	0.8882	0.8912	0.8721

Table 5.18 Variance in different bands of participant one next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1 st	4 th	5 th	14 th	6 th	11 th	8 th	4 th	5 th	28 th
DratioT	0.3407	0.2854	0.2697	0.1311	0.9467	0.6742	0.8262	0.5571	0.9182	0.9622
TratioT	0.0024	0.0034	0.0047	0.0051	0.0062	0.0457	0.0267	0.0535	0.0082	0.005
BratioT	0.0046	0.0048	0.0134	0.0072	0.0084	0.0458	0.0352	0.0735	0.0206	0.0105
AratioT	0.0018	0.0034	0.006	0.0061	0.0045	0.0197	0.0081	0.0308	0.0054	0.0027
GratioT	0.6505	0.7029	0.7061	0.8505	0.0341	0.2146	0.1037	0.285	0.0476	0.0195
FZ										
DratioT	0.5746	0.2186	0.2223	0.3757	0.9129	0.9837	0.897	0.8733	0.7358	0.7631
TratioT	0.0035	0.0079	0.0139	0.0089	0.022	0.0039	0.0433	0.0154	0.0313	0.0324
BratioT	0.0104	0.0184	0.0367	0.0221	0.0288	0.0062	0.0043	0.0646	0.1546	0.1394
AratioT	0.002	0.0052	0.0069	0.0061	0.0064	0.0011	0.0464	0.0087	0.0205	0.0156
GratioT	0.4094	0.7499	0.7202	0.5872	0.0299	0.0051	0.0091	0.0379	0.0578	0.0495
C3										
DratioT	0.199	0.0384	0.0717	0.1802	0.8353	0.8815	0.8555	0.9667	0.8555	0.973
TratioT	0.0022	0.003	0.0049	0.004	0.0221	0.0168	0.0217	0.0033	0.017	0.0018
BratioT	0.0077	0.0057	0.0099	0.0072	0.0304	0.0186	0.0345	0.0073	0.0501	0.0056

AratioT	0.002	0.0031	0.0067	0.0056	0.0101	0.0074	0.0087	0.0018	0.0082	0.0013
GratioT	0.7891	0.9498	0.9069	0.8031	0.1021	0.0756	0.0796	0.0209	0.0692	0.0182
C4										
DratioT	0.2711	0.081	0.049	0.1526	0.8423	0.8821	0.8358	0.9852	0.8531	0.861
TratioT	0.004	0.0053	0.0083	0.0072	0.0483	0.0243	0.0405	0.0023	0.0205	0.0152
BratioT	0.0087	0.0154	0.024	0.0162	0.0465	0.0509	0.0801	0.0067	0.0761	0.0868
AratioT	0.0027	0.0062	0.0082	0.0068	0.0124	0.0085	0.0086	0.0013	0.0134	0.0087
GratioT	0.7135	0.8922	0.9105	0.8172	0.0506	0.0342	0.0351	0.0045	0.0369	0.0283
P3										
DratioT	0.1156	0.1008	0.25	0.0486	0.8437	0.9899	0.7946	0.8685	0.9762	0.9701
TratioT	8.57E-04	8.71E-04	0.0016	0.002	0.0126	0.0012	0.027	0.0178	0.0032	0.0034
BratioT	0.0022	0.0011	0.0012	0.0033	0.028	0.0016	0.0324	0.0248	0.0042	0.0047
AratioT	0.0019	0.0019	0.0051	0.0055	0.011	5.21E-04	0.0128	0.0065	0.0012	0.0019
GratioT	0.8794	0.8953	0.7421	0.9406	0.1046	0.0068	0.1332	0.0824	0.0153	0.0198
P4										
DratioT	0.4532	0.0803	0.0402	0.076	0.9263	0.9785	0.907	0.987	0.9155	0.8571
TratioT	0.0015	0.0033	0.0028	0.0034	0.0136	0.0047	0.0239	0.0022	0.0166	0.0246
BratioT	0.0032	0.0066	0.0084	0.01	0.0267	0.0082	0.0359	0.0046	0.0344	0.0806
AratioT	0.0015	0.0038	0.0088	0.0049	0.0081	0.0018	0.0069	0.0014	0.007	0.0086
GratioT	0.5405	0.906	0.9399	0.9057	0.0253	0.0068	0.0264	0.0049	0.0265	0.0291

Table 5.19 Variance in different bands of participant two 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	6TH	14TH	18TH	21ST	17TH	19TH	3RD	3rd	7th	20th
DratioT	0.0276	0.2078	0.0631	0.0658	0.1395	0.0734	0.168	0.3761	0.4973	0.9234
TratioT	0.0033	0.0013	0.0022	0.001	0.0021	0.0022	9.39E-04	0.0289	0.0149	0.0033
BratioT	0.0056	0.0015	0.0059	0.0026	0.0028	0.0047	0.002	0.0108	0.0082	0.001
AratioT	0.0014	0.0021	0.0013	7.93E-04	0.0057	0.0024	0.0019	0.0358	0.0245	0.0043
GratioT	0.9622	0.7873	0.9275	0.9298	0.8499	0.9172	0.8271	0.5484	0.455	0.0679

FZ										
DratioT	0.0358	0.1352	0.0571	0.0467	0.0758	0.1522	0.0691	0.1443	0.0852	0.4627
TratioT	0.0062	0.0045	0.0105	0.0035	0.0041	0.006	0.0024	0.0125	0.0123	0.0093
BratioT	0.0172	0.0052	0.0177	0.0105	0.0074	0.0102	0.0091	0.0346	0.03	0.0265
AratioT	0.0015	0.0023	0.0016	0.0012	0.0068	0.0039	0.0018	0.0089	0.0085	0.0048
GratioT	0.9393	0.8528	0.913	0.9381	0.906	0.8276	0.9176	0.7996	0.8641	0.4967
C3										
DratioT	0.0595	0.1194	0.078	0.0835	0.1108	0.0824	0.1472	0.0385	0.1994	0.3489
TratioT	0.006	0.0038	0.0073	0.0035	0.0046	0.0049	0.003	0.0046	0.0031	0.0016
BratioT	0.0084	0.0032	0.0065	0.0037	0.0052	0.004	0.0036	0.0099	0.0076	0.0058
AratioT	0.0016	0.002	0.0014	0.001	0.0072	0.0028	0.0019	0.0079	0.0059	0.0039
GratioT	0.9244	0.8717	0.9068	0.9082	0.8722	0.9059	0.8443	0.9391	0.7841	0.6398
C4										
DratioT	0.2357	0.5413	0.1235	0.0439	0.3705	0.1435	0.4297	0.2417	0.0553	0.275
TratioT	0.0035	9.73E-04	0.0033	0.0017	0.001	8.16E-04	7.06E-04	0.0067	0.0067	0.0059
BratioT	0.006	0.0016	0.0099	0.0048	0.0011	6.69E-04	0.0031	0.0202	0.0151	0.0202
AratioT	7.67E-04	9.61E-04	8.34E-04	8.75E-04	0.0044	0.0019	7.30E-04	0.0077	0.0067	0.0046
GratioT	0.7541	0.4552	0.8625	0.9487	0.623	0.8531	0.5657	0.7237	0.9162	0.6944
P3										
DratioT	0.1732	0.2575	0.303	0.0532	0.2454	0.2319	0.5676	0.1418	0.2931	0.2818
TratioT	8.72E-04	2.81E-04	6.25E-04	6.97E-04	0.0016	0.0033	2.23E-04	0.001	9.51E-04	8.00E-04
BratioT	0.001	0.0011	8.98E-04	6.76E-04	0.0028	0.0054	4.32E-04	0.0015	0.0011	0.0017
AratioT	6.27E-04	8.86E-04	4.87E-04	5.24E-04	0.0056	0.0028	8.16E-04	0.0061	0.0053	0.0033
GratioT	0.8243	0.7402	0.6949	0.9449	0.7446	0.7566	0.4309	0.8495	0.6995	0.7124
P4										
DratioT	0.1463	0.1878	0.0958	0.1882	0.3821	0.0828	0.0936	0.0343	0.0231	0.3613
TratioT	0.008	0.004	0.0048	0.0034	0.0033	0.007	0.004	0.0041	0.0035	0.0023
BratioT	0.0072	0.0043	0.0066	0.0037	0.0028	0.0065	0.0054	0.0112	0.0074	0.0067
AratioT	0.0024	0.0027	0.0023	0.0012	0.0046	0.0026	0.0033	0.0084	0.0057	0.003
GratioT	0.8361	0.8012	0.8905	0.8035	0.6072	0.9011	0.8937	0.9421	0.9604	0.6266

Table 5.20 Variance in different bands of participant one next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9th	10th	13th	16th	1st	3rd	10th	7th	14th	16th
DratioT	0.6489	0.8279	0.7642	0.7469	0.9182	0.9108	0.8209	0.9766	0.9016	0.9089
TratioT	0.0133	0.008	0.0124	0.0124	0.0082	0.0098	0.0334	0.0019	0.0135	0.0142
BratioT	0.0069	0.002	0.0024	0.0038	0.0206	0.0187	0.03	0.0056	0.026	0.0182
AratioT	0.0143	0.01	0.0158	0.0126	0.0054	0.0046	0.0114	0.0012	0.0069	0.008
GratioT	0.3166	0.152	0.2053	0.2243	0.0476	0.0562	0.1044	0.0147	0.052	0.0507
FZ										
DratioT	0.1305	0.3514	0.4524	0.0983	0.7358	0.6007	0.9854	0.8521	0.9429	0.8691
TratioT	0.0087	0.0089	0.0107	9.31E-04	0.0313	0.0801	0.0039	0.0224	0.0119	0.0213
BratioT	0.0289	0.0342	0.0283	0.0018	0.1546	0.2152	0.0062	0.0718	0.0296	0.0672
AratioT	0.0099	0.0043	0.0037	0.0065	0.0205	0.0241	9.70E-04	0.0099	0.0034	0.0106
GratioT	0.8219	0.6012	0.5049	0.8924	0.0578	0.0799	0.0035	0.0438	0.0122	0.0318
C3										
DratioT	0.1068	0.4453	0.0367	0.0228	0.8555	0.8256	0.9661	0.6779	0.9758	0.884
TratioT	0.004	0.0023	0.0036	0.0052	0.017	0.0215	0.0061	0.0218	0.0025	0.0179
BratioT	0.011	0.0074	0.0143	0.0156	0.0501	0.0518	0.008	0.0721	0.0067	0.0267
AratioT	0.0081	0.0024	0.0028	0.006	0.0082	0.0091	0.002	0.0151	0.0012	0.0053
GratioT	0.8702	0.5425	0.9426	0.9504	0.0692	0.0919	0.0177	0.2131	0.0138	0.066
C4										
DratioT	0.2776	0.1457	0.2317	0.2947	0.8531	0.9184	0.9788	0.9835	0.9853	0.9588
TratioT	0.0069	0.0052	0.0089	0.0064	0.0205	0.0179	0.0059	0.0028	0.0032	0.0092
BratioT	0.0138	0.0238	0.0244	0.014	0.0761	0.0403	0.0079	0.0083	0.0073	0.0184
AratioT	0.0068	0.0047	0.0041	0.0057	0.0134	0.0055	0.002	0.0011	0.0011	0.0037
GratioT	0.6949	0.8206	0.7309	0.6791	0.0369	0.0179	0.0054	0.0043	0.0031	0.0099
P3										
DratioT	0.0477	0.0334	0.0823	0.1474	0.9762	0.9776	0.9842	0.9768	0.9772	0.9817
TratioT	0.0012	0.001	0.0017	0.0015	0.0032	0.0031	0.0024	0.0018	0.0031	0.0033

BratioT	0.003	0.0026	0.0026	0.0036	0.0042	0.004	0.0029	0.0025	0.0044	0.0025
AratioT	0.0073	0.0031	0.0018	0.0054	0.0012	0.001	0.0011	0.0015	0.0016	9.35E-04
GratioT	0.9409	0.9599	0.9116	0.842	0.0153	0.0142	0.0094	0.0173	0.0138	0.0115
P4										
DratioT	0.1225	0.0966	0.0479	0.1713	0.9155	0.9377	0.9793	0.9835	0.8443	0.9913
TratioT	0.0039	0.0025	0.0051	0.0022	0.0166	0.0094	0.0045	0.0025	0.0361	0.0018
BratioT	0.0085	0.0123	0.0136	0.0064	0.0344	0.029	0.0091	0.0087	0.0679	0.0036
AratioT	0.0069	0.0034	0.0024	0.007	0.007	0.0048	0.0024	0.0013	0.0146	8.20E-04
GratioT	0.8582	0.8851	0.931	0.813	0.0265	0.0191	0.0047	0.0041	0.037	0.0025

Table 5.21 Variance in different bands of participant two 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	6TH	14TH	18TH	21ST	17TH	19TH	3RD	3rd	7th	20th
DratioT	0.8528	0.9908	0.9798	0.9279	0.9782	0.9197	0.9496	0.8181	0.921	0.8646
TratioT	0.0032	8.37E-04	4.50E-04	0.0045	0.002	0.0091	7.69E-04	0.0051	0.0028	0.004
BratioT	0.0032	5.01E-04	4.55E-04	0.0068	0.0017	0.0058	6.16E-04	0.0061	0.0022	0.0039
AratioT	0.0032	4.33E-04	2.69E-04	0.0025	8.25E-04	0.003	5.21E-04	0.0029	0.0019	0.0035
GratioT	0.1376	0.0074	0.019	0.0583	0.0173	0.0624	0.0485	0.1678	0.0721	0.124
FZ										
DratioT	0.8402	0.9636	0.9726	0.9784	0.9726	0.914	0.5659	0.915	0.7948	0.7176
TratioT	0.0124	0.0033	6.34E-04	0.0019	0.0032	0.01	0.01	0.0043	0.0109	0.0205
BratioT	0.0067	0.002	7.31E-04	0.002	0.0021	0.0066	0.0057	0.0033	0.0085	0.0106
AratioT	0.0058	0.002	4.09E-04	0.0011	0.0012	0.0044	0.0065	0.0028	0.0072	0.0123
GratioT	0.1349	0.0292	0.0256	0.0166	0.0209	0.0649	0.4118	0.0746	0.1785	0.239
C3										
DratioT	0.926	0.953	0.9973	0.9366	0.9337	0.9143	0.9872	0.9702	0.977	0.8837
TratioT	0.0058	0.0037	2.63E-04	0.0037	0.0049	0.009	0.0013	0.0081	0.0064	0.0309

BratioT	0.0034	0.0023	1.61E-04	0.0037	0.0039	0.0038	7.20E-04	0.0055	0.0041	0.0196
AratioT	0.0027	0.0014	9.41E-05	0.003	0.0017	0.0029	5.53E-04	0.0031	0.0021	0.0086
GratioT	0.0622	0.0397	0.0022	0.053	0.0558	0.0701	0.0102	0.0131	0.0104	0.0572
C4										
DratioT	0.8469	0.9922	0.9829	0.9382	0.9766	0.9457	0.9358	0.8214	0.8509	0.9486
TratioT	0.0037	8.12E-04	5.43E-04	0.0046	0.0019	0.0057	0.0015	0.0105	0.0078	0.0026
BratioT	0.0034	6.53E-04	5.55E-04	0.0092	0.0029	0.0056	0.0014	0.0112	0.008	0.0026
AratioT	0.0037	3.55E-04	2.89E-04	0.0027	0.001	0.0025	8.06E-04	0.0038	0.0044	0.0016
GratioT	0.1423	0.006	0.0157	0.0454	0.0175	0.0404	0.0605	0.1532	0.1289	0.0446
P3										
DratioT	0.9843	0.9965	0.9987	0.9707	0.9835	0.4224	0.9868	0.9922	0.8547	0.9885
TratioT	4.17E-04	1.09E-04	9.16E-05	0.0011	6.19E-04	0.0197	7.43E-04	6.86E-04	0.0162	0.0022
BratioT	4.12E-04	8.15E-05	4.52E-05	6.77E-04	4.07E-04	0.0136	2.63E-04	3.71E-04	0.0081	8.14E-04
AratioT	3.08E-04	5.45E-05	1.13E-05	3.22E-04	2.37E-04	0.0099	7.61E-05	1.93E-04	0.0048	3.86E-04
GratioT	0.0146	0.0032	0.0012	0.0273	0.0152	0.5344	0.0122	0.0066	0.1163	0.0081
P4										
DratioT	0.8645	0.9945	0.9891	0.9806	0.9825	0.9628	0.8993	0.6734	0.539	0.9811
TratioT	0.002	4.76E-04	2.31E-04	0.0013	0.0013	0.0021	0.0026	0.0093	0.017	5.06E-04
BratioT	0.0015	4.40E-04	2.92E-04	0.0018	0.0019	0.0037	0.0017	0.0096	0.0152	5.95E-04
AratioT	0.0023	1.95E-04	1.23E-04	8.32E-04	7.21E-04	0.0013	7.31E-04	0.0037	0.0104	4.71E-04
GratioT	0.1297	0.0044	0.0102	0.0155	0.0136	0.0302	0.0957	0.304	0.4184	0.0173

Table 5.22 Variance in different bands of participant two next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	9th	10th	13th	16th	1st	3rd	10th	7th	14th	16th
DratioT	0.8059	0.9631	0.9221	0.8821	0.795	0.9125	0.9175	0.8983	0.8643	0.94
TratioT	0.0132	0.0014	0.0026	0.0048	0.0326	0.0164	0.0154	0.0208	0.0273	0.019

BratioT	0.0066	0.001	0.0025	0.0045	0.0206	0.0066	0.0072	0.0103	0.0101	0.0068
AratioT	0.0049	7.44E-04	0.0018	0.0028	0.0116	0.0043	0.0049	0.0051	0.0057	0.0028
GratioT	0.1693	0.0337	0.071	0.1059	0.1403	0.0602	0.055	0.0654	0.0926	0.0314
FZ										
DratioT	0.9084	0.9551	0.7331	0.8888	0.8261	0.9213	0.9962	0.9764	0.9412	0.9473
TratioT	0.0055	0.0026	0.0186	0.0072	0.0422	0.0226	0.001	0.0066	0.0162	0.0228
BratioT	0.0044	0.0018	0.0119	0.0058	0.0243	0.0083	4.82E-04	0.0032	0.006	0.0076
AratioT	0.0035	0.0016	0.0093	0.0037	0.0105	0.0046	2.61E-04	0.0014	0.0032	0.0025
GratioT	0.0783	0.0389	0.2271	0.0945	0.0968	0.0432	0.002	0.0125	0.0333	0.0199
C3										
DratioT	0.9895	0.9919	0.9493	0.9551	0.7259	0.717	0.9703	0.9288	0.7919	0.8607
TratioT	0.0035	0.0022	0.0115	0.0181	0.1165	0.1199	0.0124	0.0307	0.0863	0.0804
BratioT	0.002	0.0015	0.0092	0.0078	0.0603	0.0639	0.0063	0.015	0.0471	0.0276
AratioT	7.34E-04	0.0011	0.0058	0.0035	0.0104	0.0106	0.0013	0.0024	0.0062	0.0046
GratioT	0.0043	0.0032	0.0242	0.0156	0.0868	0.0885	0.0098	0.0231	0.0685	0.0268
C4										
DratioT	0.8428	0.9549	0.8841	0.9018	0.7907	0.8426	0.9752	0.9414	0.8521	0.7894
TratioT	0.0114	0.0023	0.0059	0.0069	0.1142	0.0896	0.0143	0.0329	0.0832	0.1417
BratioT	0.0088	0.0022	0.0064	0.0071	0.061	0.0411	0.0064	0.017	0.0413	0.0477
AratioT	0.0049	0.0011	0.0033	0.0027	0.0092	0.0072	0.0011	0.0023	0.0055	0.0078
GratioT	0.1321	0.0396	0.1004	0.0815	0.0249	0.0196	0.0029	0.0065	0.0178	0.0135
P3										
DratioT	0.9798	0.9977	0.9338	0.982	0.9939	0.9821	0.9937	0.994	0.9944	0.8108
TratioT	0.002	3.08E-04	0.0069	0.003	2.95E-04	0.0017	3.24E-04	2.98E-04	2.64E-04	0.0222
BratioT	0.0013	1.57E-04	0.004	0.0015	1.79E-04	5.14E-04	1.92E-04	1.57E-04	1.24E-04	0.0108
AratioT	5.17E-04	4.74E-05	0.0022	4.76E-04	6.56E-05	1.86E-04	8.00E-05	4.26E-05	2.71E-05	0.0026
GratioT	0.0164	0.0018	0.053	0.0129	0.0056	0.0156	0.0057	0.0055	0.0052	0.1536
P4										
DratioT	0.9093	0.9445	0.294	0.8754	0.9082	0.9782	0.9883	0.9914	0.9424	0.9992

TratioT	0.0029	0.0015	0.0192	0.0035	0.0446	0.011	0.0062	0.0044	0.0302	5.47E-04
BratioT	0.0029	0.002	0.0228	0.0064	0.0144	0.0032	0.0018	0.0018	0.0078	1.59E-04
AratioT	0.0022	7.89E-04	0.0136	0.0025	0.0038	0.001	5.59E-04	3.85E-04	0.0023	3.47E-05
GratioT	0.0827	0.0512	0.6504	0.1121	0.0291	0.0066	0.0031	0.002	0.0174	8.37E-05

Table 5.23 Variance in different bands of participant two 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	21ST	17TH	19TH	3RD	6TH	14TH	18TH	3rd	7th	20th
DratioT	0.9768	0.9462	0.9913	0.7929	0.5475	0.98	0.8457	0.9764	0.9643	0.8273
TratioT	0.0021	0.0035	1.69E-04	0.003	0.0074	2.94E-04	0.0123	9.43E-04	0.0024	0.0089
BratioT	0.0013	0.0035	1.51E-04	0.0025	0.0042	2.62E-04	0.0069	7.60E-04	0.0012	0.0053
AratioT	0.001	0.0024	9.80E-05	0.0016	0.004	1.42E-04	0.0061	6.26E-04	9.26E-04	0.004
GratioT	0.0187	0.0443	0.0082	0.2	0.4369	0.0193	0.129	0.0212	0.0311	0.1545
FZ										
DratioT	0.7914	0.7699	0.9868	0.4203	0.6472	0.9694	0.5432	0.9269	0.7238	0.8309
TratioT	0.0246	0.0211	2.78E-04	0.0127	0.0072	5.08E-04	0.0497	0.0054	0.0194	0.0183
BratioT	0.0132	0.0151	2.45E-04	0.0077	0.004	4.34E-04	0.0282	0.0037	0.0115	0.0084
AratioT	0.011	0.0124	1.94E-04	0.0062	0.0038	2.80E-04	0.0234	0.0029	0.0096	0.0057
GratioT	0.1598	0.1816	0.0124	0.5532	0.3378	0.0294	0.3555	0.0611	0.2356	0.1366
C3										
DratioT	0.8925	0.8345	0.9983	0.947	0.9195	0.9976	0.8979	0.9955	0.9818	0.9379
TratioT	0.0088	0.0088	1.89E-04	0.0044	0.0068	2.10E-04	0.0109	0.0015	0.0097	0.0144
BratioT	0.0049	0.0077	9.15E-05	0.0031	0.0037	1.57E-04	0.0063	0.001	0.0031	0.0101
AratioT	0.0031	0.0064	5.78E-05	0.0015	0.0031	7.93E-05	0.0029	3.33E-04	0.0012	0.0061
GratioT	0.0907	0.1426	0.0014	0.044	0.0669	0.002	0.0821	0.0017	0.0041	0.0315
C4										
DratioT	0.9743	0.9498	0.9928	0.7833	0.5414	0.9848	0.8939	0.9618	0.9592	0.8266
TratioT	0.0022	0.0045	1.62E-04	0.0046	0.0101	3.09E-04	0.0097	0.002	0.0103	0.0148

BratioT	0.0025	0.0049	1.89E-04	0.0048	0.0061	3.23E-04	0.0067	0.0018	0.0041	0.0089
AratioT	0.0014	0.0023	9.74E-05	0.002	0.0053	1.33E-04	0.0042	0.0011	0.0013	0.0043
GratioT	0.0196	0.0385	0.0068	0.2053	0.4371	0.0144	0.0855	0.0333	0.0251	0.1454
P3										
DratioT	0.9464	0.9654	0.9994	0.5368	0.9789	0.9991	0.8981	0.9965	0.9925	0.9828
TratioT	0.0015	0.0012	4.13E-05	0.0254	0.0016	4.57E-05	0.0042	4.04E-04	0.0032	0.0017
BratioT	0.0011	6.63E-04	2.06E-05	0.0108	6.80E-04	1.79E-05	0.0025	2.36E-04	6.11E-04	0.0011
AratioT	0.0012	2.97E-04	5.39E-06	0.0026	2.47E-04	5.74E-06	0.0018	8.33E-05	2.12E-04	6.71E-04
GratioT	0.0498	0.0325	5.71E-04	0.4244	0.0186	7.81E-04	0.0933	0.0028	0.0035	0.0137
P4										
DratioT	0.9897	0.9745	0.9934	0.4333	0.8245	0.9922	0.9393	0.881	0.9576	0.8818
TratioT	6.41E-04	0.0019	9.86E-05	0.0133	0.0028	9.94E-05	0.0031	0.0033	0.0059	0.0048
BratioT	8.41E-04	0.0026	1.01E-04	0.0102	0.0017	1.26E-04	0.0025	0.004	0.0024	0.0045
AratioT	4.53E-04	8.52E-04	5.53E-05	0.0037	0.0018	4.75E-05	0.0013	0.0022	0.0013	0.0026
GratioT	0.0083	0.0202	0.0064	0.5395	0.1692	0.0076	0.0538	0.1095	0.0328	0.1064

Table 5.24 Variance in different bands of participant two next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9th	10th	13th	16th	1st	3rd	10th	7th	14th	16th
DratioT	0.944	0.8285	0.8025	0.6643	0.8631	0.8955	0.8097	0.8555	0.6504	0.7522
TratioT	0.0019	0.0058	0.009	0.0156	0.0187	0.0242	0.0395	0.0259	0.1105	0.0887
BratioT	0.0025	0.0054	0.0087	0.0125	0.0094	0.0076	0.0159	0.0107	0.0559	0.0244
AratioT	0.0014	0.0026	0.0049	0.0088	0.0082	0.005	0.0093	0.0072	0.0149	0.0117
GratioT	0.0503	0.1577	0.1749	0.2988	0.1005	0.0677	0.1256	0.1007	0.1682	0.123
FZ										
DratioT	0.7995	0.8344	0.8585	0.8612	0.9873	0.8764	0.9705	0.8745	0.9821	0.9826
TratioT	0.0165	0.0121	0.0116	0.014	0.0028	0.0337	0.0087	0.0379	0.0078	0.0073

BratioT	0.0126	0.0089	0.0076	0.0088	0.0011	0.0115	0.0033	0.0124	0.0028	0.0021
AratioT	0.0067	0.0049	0.0048	0.0049	9.09E-04	0.0075	0.0019	0.0081	8.62E-04	9.93E-04
GratioT	0.1648	0.1398	0.1176	0.1111	0.0078	0.0709	0.0155	0.0672	0.0064	0.007
C3										
DratioT	0.9819	0.9346	0.9217	0.9808	0.9541	0.6421	0.8115	0.7695	0.8124	0.5299
TratioT	0.0053	0.0225	0.0417	0.0043	0.0157	0.1461	0.1111	0.0959	0.1136	0.3031
BratioT	0.004	0.012	0.0148	0.0041	0.0069	0.0772	0.0305	0.0471	0.0429	0.0889
AratioT	0.0021	0.0066	0.0051	0.0021	0.0014	0.0111	0.0068	0.0093	0.0062	0.0172
GratioT	0.0069	0.0243	0.0167	0.0087	0.0219	0.1235	0.0401	0.0782	0.0248	0.0609
C4										
DratioT	0.921	0.8304	0.7367	0.7087	0.8324	0.7248	0.7026	0.7368	0.9274	0.7144
TratioT	0.0035	0.0072	0.055	0.0227	0.0853	0.141	0.2024	0.1428	0.0474	0.2028
BratioT	0.0053	0.0101	0.0263	0.0162	0.0404	0.0891	0.0611	0.0745	0.0188	0.0591
AratioT	0.0022	0.0032	0.0092	0.0085	0.0083	0.0104	0.0107	0.0125	0.0027	0.0102
GratioT	0.068	0.1492	0.1728	0.2439	0.0336	0.0348	0.0232	0.0333	0.0037	0.0135
P3										
DratioT	0.9811	0.9783	0.9866	0.9681	0.9877	0.9869	0.9691	0.9941	0.973	0.8108
TratioT	0.0025	0.0028	0.0025	0.0073	4.01E-04	6.79E-04	0.0034	3.10E-04	0.0038	0.0222
BratioT	0.0013	0.0016	9.21E-04	0.0034	2.86E-04	2.58E-04	9.97E-04	1.54E-04	0.0017	0.0108
AratioT	7.26E-04	5.75E-04	4.14E-04	9.01E-04	9.23E-05	8.15E-05	3.08E-04	4.56E-05	4.38E-04	0.0026
GratioT	0.0144	0.0167	0.0095	0.0203	0.0115	0.0121	0.0262	0.0054	0.0211	0.1536
P4										
DratioT	0.686	0.9346	0.774	0.7751	0.9534	0.9878	0.9959	0.9728	0.9885	0.9412
TratioT	0.0097	0.0017	0.0225	0.0071	0.0179	0.0066	0.0025	0.013	0.007	0.0422
BratioT	0.0129	0.0024	0.0137	0.0083	0.0055	0.0018	6.05E-04	0.0041	0.003	0.0089
AratioT	0.0067	9.47E-04	0.0065	0.0053	0.0025	5.51E-04	1.49E-04	0.0015	4.19E-04	0.0024
GratioT	0.2847	0.0604	0.1832	0.2042	0.0206	0.0032	8.58E-04	0.0087	0.0011	0.0053

Table 5.25 Variance in different bands of participant Three 1st 10 events for High arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2ND	10TH	20TH	4TH	9TH	5TH	23RD	6th	8th	19th
DratioT	0.9558	0.7591	0.8299	0.9552	0.8607	0.8963	0.9501	0.9318	0.9333	0.996
TratioT	0.0095	0.0447	0.0519	0.0093	0.0305	0.0184	0.0137	0.0274	0.024	0.0016
BratioT	0.004	0.0235	0.0224	0.0045	0.0142	0.0074	0.0057	0.0108	0.0117	8.33E-04
AratioT	0.0013	0.0071	0.0063	0.0013	0.0047	0.0038	0.0026	0.0043	0.0043	2.22E-04
GratioT	0.0295	0.1655	0.0895	0.0296	0.0899	0.074	0.0279	0.0256	0.0267	0.0014
FZ										
DratioT	0.9732	0.8909	0.8911	0.9681	0.9582	0.9552	0.8591	0.9512	0.8757	0.939
TratioT	0.0074	0.035	0.041	0.0093	0.013	0.0128	0.0463	0.0222	0.0488	0.0268
BratioT	0.0033	0.0149	0.0218	0.0047	0.0059	0.0046	0.0219	0.0107	0.0271	0.0159
AratioT	0.0011	0.0039	0.0054	0.0012	0.0017	0.0023	0.008	0.0036	0.0099	0.0042
GratioT	0.015	0.0553	0.0408	0.0167	0.0212	0.0252	0.0647	0.0122	0.0385	0.0141
C3										
DratioT	0.9575	0.7767	0.8018	0.8219	0.8716	0.852	0.7884	0.9127	0.8938	0.8482
TratioT	0.0053	0.0414	0.0534	0.0254	0.0224	0.0219	0.0473	0.0205	0.0231	0.0279
BratioT	0.0028	0.0163	0.0223	0.0142	0.0133	0.0084	0.0209	0.0108	0.0164	0.02
AratioT	0.0012	0.0048	0.0065	0.0043	0.0039	0.0039	0.0089	0.0039	0.0045	0.0066
GratioT	0.0332	0.1608	0.116	0.1342	0.0888	0.1138	0.1345	0.0522	0.0622	0.0972
C4										
DratioT	0.9423	0.8729	0.8511	0.8444	0.9074	0.681	0.8036	0.9532	0.9912	0.8271
TratioT	0.0119	0.0254	0.0438	0.0334	0.0185	0.0628	0.0454	0.0182	0.0036	0.0678
BratioT	0.0072	0.0146	0.0163	0.0192	0.0091	0.0371	0.0239	0.0085	0.0014	0.0365
AratioT	0.0018	0.0048	0.0091	0.0054	0.0038	0.0133	0.0099	0.003	6.56E-04	0.0111
GratioT	0.0368	0.0823	0.0798	0.0976	0.0612	0.2057	0.1171	0.0171	0.0032	0.0575
P3										

DratioT	0.9826	0.9547	0.8381	0.9528	0.9743	0.8	0.7389	0.8419	0.8053	0.9826
TratioT	8.25E-04	0.0022	0.0142	0.002	0.0014	0.0067	0.0139	0.0145	0.0199	0.0016
BratioT	4.61E-04	9.63E-04	0.0035	8.89E-04	6.47E-04	0.0037	0.0095	0.011	0.0121	7.95E-04
AratioT	3.20E-04	5.96E-04	0.0022	5.18E-04	4.80E-04	0.002	0.0059	0.0045	0.0054	5.19E-04
GratioT	0.0158	0.0416	0.1421	0.0437	0.0232	0.1876	0.2318	0.1281	0.1573	0.0145
P4										
DratioT	0.9864	0.9638	0.99	0.9318	0.9585	0.5868	0.9522	0.9973	0.9309	0.9807
TratioT	0.0025	0.0047	0.0023	0.0099	0.0078	0.0598	0.0121	8.28E-04	0.0155	0.0053
BratioT	0.0013	0.0031	9.30E-04	0.0065	0.0037	0.0301	0.0046	4.45E-04	0.0127	0.0037
AratioT	3.18E-04	0.0012	3.98E-04	0.002	0.0012	0.0108	0.002	1.92E-04	0.0047	0.0012
GratioT	0.0095	0.0272	0.0064	0.0499	0.0287	0.3126	0.0291	0.0012	0.0362	0.009

Table 5.26 Variance in different bands of participant Three next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1st	4th	5th	14th	6th	11th	8th	4th	5th	28th
DratioT	0.9535	0.9131	0.9871	0.9953	0.9836	0.9682	0.9377	0.9965	0.9945	0.9774
TratioT	0.0157	0.0275	0.0051	0.0016	0.0059	0.0134	0.0248	0.0011	0.0016	0.0103
BratioT	0.0083	0.0156	0.0022	9.06E-04	0.0034	0.0067	0.0107	5.57E-04	0.0015	0.0042
AratioT	0.0026	0.0054	7.76E-04	3.51E-04	0.0013	0.0024	0.0041	2.79E-04	3.86E-04	0.0019
GratioT	0.0199	0.0383	0.0048	0.0018	0.0059	0.0093	0.0227	0.0015	0.0021	0.0062
FZ										
DratioT	0.9094	0.9356	0.9696	0.9459	0.9964	0.9491	0.9467	0.9925	0.9969	0.9924
TratioT	0.028	0.029	0.0134	0.0264	0.0015	0.0235	0.0236	0.0036	0.0012	0.0038
BratioT	0.0232	0.0131	0.0066	0.0102	8.85E-04	0.0128	0.013	0.0015	9.34E-04	0.0018
AratioT	0.0067	0.0046	0.002	0.0046	3.61E-04	0.0043	0.0045	6.75E-04	2.97E-04	7.65E-04
GratioT	0.0327	0.0178	0.0084	0.0129	7.88E-04	0.0103	0.0122	0.0018	7.09E-04	0.0013
C3										
DratioT	0.8468	0.8636	0.9549	0.989	0.9678	0.981	0.9559	0.9942	0.9951	0.9514
TratioT	0.0232	0.021	0.0068	0.0022	0.0079	0.0047	0.0099	0.0014	0.0011	0.0114

BratioT	0.0178	0.0154	0.0051	0.0011	0.0047	0.0027	0.0061	6.96E-04	7.09E-04	0.0066
AratioT	0.0067	0.0052	0.002	5.14E-04	0.002	0.0011	0.0027	3.73E-04	3.46E-04	0.0044
GratioT	0.1055	0.0947	0.0311	0.0071	0.0176	0.0104	0.0254	0.0033	0.0028	0.0261
C4										
DratioT	0.9503	0.9736	0.9521	0.9952	0.9772	0.9442	0.9403	0.9933	0.9904	0.9312
TratioT	0.0152	0.009	0.0164	0.0018	0.0076	0.0229	0.0175	0.0022	0.0032	0.0268
BratioT	0.0102	0.0051	0.0101	9.90E-04	0.0051	0.0118	0.0142	0.0013	0.0025	0.0147
AratioT	0.003	0.0016	0.0032	4.33E-04	0.0018	0.004	0.0062	6.68E-04	7.82E-04	0.0078
GratioT	0.0212	0.0107	0.0181	0.0015	0.0083	0.0171	0.0218	0.0025	0.0031	0.0196
P3										
DratioT	0.9722	0.9592	0.9823	0.9892	0.9902	0.9871	0.9787	0.996	0.994	0.9893
TratioT	0.0033	0.0036	0.0016	9.72E-04	0.0023	0.0027	0.0037	6.66E-04	0.0014	0.0019
BratioT	0.0017	0.0028	7.41E-04	6.38E-04	6.61E-04	0.0011	0.0014	2.50E-04	4.65E-04	0.0011
AratioT	7.10E-04	9.12E-04	3.93E-04	3.22E-04	2.55E-04	4.12E-04	5.99E-04	1.43E-04	1.78E-04	5.99E-04
GratioT	0.0221	0.0335	0.015	0.0089	0.0066	0.0087	0.0156	0.003	0.0039	0.0072
P4										
DratioT	0.9917	0.9845	0.9807	0.9894	0.9741	0.9677	0.951	0.9953	0.9947	0.9702
TratioT	0.0019	0.0041	0.0054	0.0025	0.0099	0.0142	0.0153	0.0012	0.0026	0.0088
BratioT	0.0013	0.0028	0.0045	0.0017	0.0043	0.0061	0.0089	8.50E-04	8.20E-04	0.0064
AratioT	5.63E-04	9.69E-04	0.001	7.13E-04	0.002	0.0017	0.0039	3.53E-04	2.50E-04	0.0033
GratioT	0.0045	0.0076	0.0084	0.0056	0.0097	0.0102	0.0209	0.0022	0.0017	0.0114

Table 5.27 Variance in different bands of participant Three 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	21ST	17TH	19TH	3RD	6TH	14TH	18TH	3rd	7th	20th
DratioT	0.9491	0.9051	0.8752	0.9652	0.8508	0.8752	0.958	0.9737	0.9623	0.9826
TratioT	0.0091	0.0264	0.0331	0.009	0.042	0.0331	0.0078	0.0086	0.012	0.0059
BratioT	0.0053	0.0119	0.0139	0.005	0.0153	0.0139	0.004	0.0054	0.0079	0.0025

AratioT	0.0019	0.0035	0.0062	0.0015	0.0046	0.0062	0.0014	0.0014	0.0029	9.74E-04
GratioT	0.0345	0.0531	0.0717	0.0194	0.0873	0.0717	0.0288	0.0108	0.0148	0.008
FZ										
DratioT	0.9855	0.8553	0.8675	0.9063	0.963	0.8675	0.9686	0.9661	0.889	0.9075
TratioT	0.0035	0.0527	0.0478	0.0318	0.0136	0.0478	0.0095	0.0149	0.0468	0.0391
BratioT	0.0028	0.0247	0.0213	0.0191	0.0049	0.0213	0.005	0.0075	0.0254	0.0189
AratioT	7.50E-04	0.0068	0.0083	0.0047	0.0014	0.0083	0.0014	0.0021	0.0099	0.0067
GratioT	0.0075	0.0605	0.0552	0.0381	0.0171	0.0552	0.0154	0.0094	0.0288	0.0279
C3										
DratioT	0.9472	0.7782	0.8793	0.6899	0.8681	0.8793	0.8682	0.9219	0.9629	0.9598
TratioT	0.0063	0.051	0.0301	0.0734	0.031	0.0301	0.0177	0.013	0.0077	0.0063
BratioT	0.0053	0.0207	0.0113	0.0336	0.0125	0.0113	0.0116	0.009	0.0049	0.0038
AratioT	0.0019	0.0076	0.0042	0.0107	0.0029	0.0042	0.0037	0.0035	0.0018	0.0017
GratioT	0.0392	0.1425	0.0752	0.1924	0.0854	0.0752	0.0988	0.0527	0.0228	0.0284
C4										
DratioT	0.9699	0.8561	0.9052	0.8838	0.7897	0.9052	0.9426	0.9803	0.9915	0.9551
TratioT	0.0052	0.0375	0.0272	0.032	0.0493	0.0272	0.0108	0.008	0.0028	0.0147
BratioT	0.004	0.0213	0.0129	0.0185	0.0217	0.0129	0.0071	0.0038	0.0015	0.0075
AratioT	0.0013	0.0059	0.0044	0.0052	0.0088	0.0044	0.0024	0.0011	7.36E-04	0.0032
GratioT	0.0195	0.0792	0.0503	0.0604	0.1306	0.0503	0.0371	0.0068	0.0035	0.0194
P3										
DratioT	0.9815	0.9729	0.8818	0.8838	0.9146	0.8818	0.9649	0.9944	0.9925	0.9766
TratioT	9.10E-04	0.0015	0.0072	0.032	0.0044	0.0072	0.0016	4.68E-04	6.29E-04	0.0021
BratioT	4.94E-04	6.19E-04	0.0032	0.0185	0.0023	0.0032	8.76E-04	3.29E-04	4.58E-04	9.23E-04
AratioT	3.29E-04	6.06E-04	0.0024	0.0052	0.0011	0.0024	3.30E-04	1.24E-04	1.87E-04	4.71E-04
GratioT	0.0167	0.0244	0.1054	0.0604	0.0777	0.1054	0.0323	0.0047	0.0063	0.02
P4										
DratioT	0.9826	0.8966	0.9809	0.8372	0.9673	0.9809	0.9842	0.9873	0.9957	0.985
TratioT	0.0029	0.0183	0.004	0.039	0.0068	0.004	0.0023	0.0034	8.61E-04	0.0036

BratioT	0.0014	0.012	0.0028	0.0169	0.003	0.0028	0.0016	0.0024	8.39E-04	0.0024
AratioT	5.13E-04	0.0035	7.45E-04	0.0062	0.0011	7.45E-04	4.78E-04	6.96E-04	2.54E-04	7.48E-04
GratioT	0.0126	0.0697	0.0115	0.1007	0.0219	0.0115	0.0115	0.0061	0.0023	0.0081

Table 5.28 Variance in different bands of participant Three next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9th	10th	13th	16th	1st	3rd	10th	7th	14th	16th
DratioT	0.9372	0.9768	0.9568	0.9696	0.9655	0.9856	0.973	0.9982	0.922	0.8941
TratioT	0.0234	0.0079	0.0144	0.0112	0.0132	0.0052	0.0108	6.72E-04	0.0325	0.0468
BratioT	0.0121	0.0047	0.0075	0.0052	0.0045	0.0027	0.0055	3.21E-04	0.0162	0.0198
AratioT	0.0035	0.0013	0.0028	0.0018	0.003	0.001	0.0016	1.31E-04	0.0056	0.0076
GratioT	0.0237	0.0092	0.0184	0.0122	0.0137	0.0055	0.009	6.41E-04	0.0236	0.0317
FZ										
DratioT	0.9471	0.9495	0.9274	0.7516	0.9769	0.9821	0.9604	0.997	0.9378	0.9724
TratioT	0.0259	0.0213	0.0286	0.1147	0.0111	0.0075	0.0173	0.0013	0.0284	0.0142
BratioT	0.012	0.0115	0.0162	0.055	0.0042	0.0044	0.0086	7.06E-04	0.015	0.0055
AratioT	0.0029	0.0037	0.0059	0.0167	0.0022	0.0016	0.0038	2.74E-04	0.0064	0.0028
GratioT	0.0121	0.014	0.0219	0.062	0.0056	0.0044	0.0099	7.11E-04	0.0125	0.0051
C3										
DratioT	0.9679	0.9838	0.9646	0.9739	0.8969	0.984	0.9742	0.9983	0.9122	0.9394
TratioT	0.0098	0.0034	0.0064	0.005	0.0208	0.0034	0.0052	4.24E-04	0.0191	0.0162
BratioT	0.0039	0.0023	0.0046	0.0031	0.0136	0.0024	0.003	2.15E-04	0.0119	0.0068
AratioT	0.0013	6.92E-04	0.0014	0.0012	0.0069	9.10E-04	0.0017	1.20E-04	0.0061	0.0038
GratioT	0.0171	0.0098	0.0231	0.0168	0.0617	0.0094	0.0158	9.91E-04	0.0507	0.0339
C4										
DratioT	0.9807	0.9954	0.9458	0.6854	0.9238	0.9813	0.9855	0.9987	0.8722	0.9317
TratioT	0.0062	0.0015	0.0185	0.112	0.0258	0.007	0.0061	4.77E-04	0.0424	0.0252
BratioT	0.0048	0.0011	0.0111	0.0682	0.0134	0.0028	0.0029	2.48E-04	0.0305	0.0151
AratioT	0.0014	2.96E-04	0.004	0.0215	0.0094	0.0014	0.0011	1.09E-04	0.0112	0.0056

GratioT	0.0069	0.0017	0.0207	0.1129	0.0276	0.0074	0.0044	4.26E-04	0.0436	0.0225
P3										
DratioT	0.9692	0.9905	0.9557	0.9806	0.9344	0.9857	0.9897	0.9986	0.9916	0.954
TratioT	0.0026	9.53E-04	0.0041	0.0018	0.0108	0.0025	0.0016	1.86E-04	0.0013	0.0067
BratioT	0.0024	6.23E-04	0.0025	0.0014	0.0038	9.76E-04	6.48E-04	9.61E-05	7.97E-04	0.0039
AratioT	0.0011	2.20E-04	0.0012	6.12E-04	0.0025	5.20E-04	3.27E-04	4.96E-05	2.52E-04	0.0017
GratioT	0.0247	0.0077	0.0364	0.0155	0.0486	0.0103	0.0078	0.0011	0.0061	0.0336
P4										
DratioT	0.9926	0.9689	0.9744	0.9594	0.974	0.9827	0.9763	0.9982	0.9401	0.9022
TratioT	0.0016	0.0088	0.0061	0.0104	0.0063	0.006	0.009	5.98E-04	0.0239	0.0365
BratioT	0.0013	0.0055	0.0049	0.0063	0.0048	0.0031	0.0051	3.94E-04	0.0121	0.0221
AratioT	4.59E-04	0.0019	0.0015	0.0026	0.0019	0.0011	0.0014	1.37E-04	0.0037	0.0056
GratioT	0.004	0.0149	0.0131	0.0213	0.013	0.0071	0.0082	7.21E-04	0.0203	0.0336

Table 5.29 Variance in different bands of participant Four 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2ND	10TH	20TH	4TH	9TH	5TH	23RD	6th	8th	19th
DratioT	0.9996	0.9989	0.9945	0.9984	0.9942	0.998	0.9978	0.9329	0.998	0.9935
TratioT	1.71E-04	7.15E-04	0.0025	8.99E-04	0.0034	0.001	0.0011	0.0291	9.11E-04	0.0036
BratioT	1.73E-04	2.63E-04	0.0021	5.04E-04	0.0018	7.70E-04	7.83E-04	0.0295	7.81E-04	0.002
AratioT	3.47E-05	6.74E-05	5.08E-04	1.34E-04	4.41E-04	1.44E-04	2.42E-04	0.0039	1.37E-04	4.09E-04
GratioT	1.75E-05	3.42E-05	4.59E-04	8.16E-05	2.33E-04	1.12E-04	1.27E-04	0.0045	1.25E-04	4.45E-04
FZ										
DratioT	0.9994	0.9972	0.9988	0.9968	0.9743	0.989	0.9987	0.9947	0.9972	0.9922
TratioT	2.97E-04	0.0019	5.49E-04	0.0016	0.017	0.0056	6.91E-04	0.0027	0.0015	0.0045
BratioT	2.24E-04	7.46E-04	4.70E-04	0.0012	0.0067	0.0043	4.49E-04	0.0021	0.001	0.0025

AratioT	2.63E-05	9.74E-05	9.87E-05	2.13E-04	0.0012	5.83E-04	6.69E-05	2.53E-04	1.42E-04	4.37E-04
GratioT	2.13E-05	6.20E-05	8.94E-05	1.76E-04	8.22E-04	4.83E-04	5.93E-05	2.91E-04	1.48E-04	4.03E-04
C3										
DratioT	0.9991	0.9946	0.9959	0.9959	0.9671	0.9992	0.995	0.9978	0.9971	0.9732
TratioT	3.85E-04	0.0034	0.002	0.002	0.0196	3.05E-04	0.0028	0.0012	0.0013	0.014
BratioT	3.17E-04	0.0015	0.0014	0.0014	0.0089	3.88E-04	0.0016	7.53E-04	0.0013	0.0098
AratioT	7.02E-05	2.82E-04	3.02E-04	3.02E-04	0.0023	5.48E-05	3.30E-04	1.35E-04	1.69E-04	0.0017
GratioT	8.54E-05	2.78E-04	3.94E-04	3.94E-04	0.0021	6.29E-05	2.71E-04	1.15E-04	1.40E-04	0.0012
C4										
DratioT	0.9655	0.963	0.9949	0.9945	0.9692	0.9957	0.9969	0.9897	0.9083	0.9449
TratioT	0.0167	0.0249	0.0018	0.0025	0.0178	0.0023	0.0015	0.0044	0.0462	0.0308
BratioT	0.015	0.0095	0.0025	0.0023	0.0103	0.0015	0.0013	0.0046	0.0394	0.0204
AratioT	0.0019	0.0016	4.37E-04	4.34E-04	0.0017	2.97E-04	1.83E-04	6.72E-04	0.004	0.0022
GratioT	9.65E-04	9.17E-04	3.21E-04	2.24E-04	0.001	2.08E-04	1.43E-04	5.62E-04	0.0022	0.0016
P3										
DratioT	0.9996	0.9998	0.9987	0.9992	0.9975	0.9992	0.9977	0.9914	0.9993	0.9993
TratioT	1.91E-04	8.16E-05	5.28E-04	3.88E-04	0.0014	3.66E-04	0.0011	0.0031	2.91E-04	3.32E-04
BratioT	9.14E-05	4.49E-05	3.64E-04	2.50E-04	5.66E-04	2.04E-04	6.66E-04	0.0027	2.09E-04	1.66E-04
AratioT	2.02E-05	5.95E-06	7.90E-05	4.39E-05	1.29E-04	5.70E-05	1.17E-04	5.50E-04	4.28E-05	3.43E-05
GratioT	7.49E-05	2.24E-05	3.34E-04	1.55E-04	4.03E-04	2.06E-04	4.46E-04	0.0022	1.54E-04	1.38E-04
P4										
DratioT	0.8724	0.8284	0.8463	0.8043	0.5246	0.7698	0.4179	0.1788	0.9154	0.807
TratioT	0.0016	0.0019	0.0018	0.0027	0.0029	0.0019	0.0065	0.0095	0.0013	0.0012
BratioT	0.0011	9.88E-04	7.14E-04	0.0014	0.0014	8.17E-04	0.0028	0.004	4.48E-04	7.05E-04
AratioT	0.0016	0.0021	0.0021	0.0028	0.0016	0.002	0.0042	0.0102	9.84E-04	3.14E-04
GratioT	0.1233	0.1667	0.1491	0.1888	0.4696	0.2254	0.5686	0.7975	0.0819	0.1907

Table 5.30 Variance in different bands of participant Four next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1st	4th	5th	14th	6th	11th	8th	4th	5th	28th
DratioT	0.9818	0.9787	0.9863	0.9771	0.7926	0.9555	0.9176	0.9787	0.9528	0.9876
TratioT	0.009	5.54E-04	0.0079	0.016	0.0074	0.0015	0.0049	5.54E-04	0.0023	0.0013
BratioT	0.0072	4.22E-04	0.0047	0.0055	0.004	0.0012	0.0026	4.22E-04	0.0013	7.18E-04
AratioT	9.19E-04	1.13E-04	5.67E-04	8.32E-04	0.0027	3.10E-04	0.001	1.13E-04	6.10E-04	1.99E-04
GratioT	9.50E-04	0.0202	4.99E-04	5.78E-04	0.1933	0.0415	0.0738	0.0202	0.043	0.0103
FZ										
DratioT	0.9968	0.9986	0.9984	0.9769	0.9677	0.97	0.8049	0.9986	0.802	0.9737
TratioT	0.0016	9.66E-05	9.92E-04	0.0152	0.0024	0.0026	0.0259	9.66E-05	0.0198	0.0057
BratioT	0.0013	7.93E-05	5.04E-04	0.0069	0.0016	0.0016	0.0142	7.93E-05	0.0159	0.0039
AratioT	1.39E-04	1.40E-05	4.59E-05	6.39E-04	4.45E-04	2.82E-04	0.0028	1.40E-05	0.0032	4.80E-04
GratioT	1.32E-04	0.0013	4.56E-05	3.88E-04	0.0278	0.0255	0.1522	0.0013	0.1592	0.0163
C3										
DratioT	0.9683	0.9938	0.9984	0.9883	0.5929	0.9617	0.8211	0.9938	0.6008	0.9673
TratioT	0.0149	1.43E-04	0.001	0.0066	0.0117	9.76E-04	0.0162	1.43E-04	0.0182	0.0053
BratioT	0.0132	9.85E-05	4.39E-04	0.0044	0.0082	9.33E-04	0.0085	9.85E-05	0.0109	0.0021
AratioT	0.0018	3.44E-05	6.46E-05	4.37E-04	0.0053	2.58E-04	0.002	3.44E-05	0.0044	5.18E-04
GratioT	0.0018	0.0059	5.00E-05	2.85E-04	0.382	0.0361	0.1522	0.0059	0.3658	0.0249
C4										
DratioT	0.8926	0.9963	0.9908	0.9728	0.6034	0.9868	0.8211	0.9963	0.9213	0.8996
TratioT	0.0598	1.45E-04	0.0056	0.0194	0.018	5.52E-04	0.0162	1.45E-04	0.0069	0.0374
BratioT	0.0407	1.25E-04	0.0031	0.0065	0.0129	4.81E-04	0.0085	1.25E-04	0.0037	0.0117
AratioT	0.004	2.18E-05	3.27E-04	8.61E-04	0.0056	9.64E-05	0.002	2.18E-05	0.0011	0.0019
GratioT	0.0029	0.0035	1.84E-04	4.44E-04	0.3601	0.0121	0.1522	0.0035	0.0671	0.0494
P3										
DratioT	0.9981	0.6496	0.9978	0.9986	0.5592	0.9603	0.873	0.6496	0.798	0.9509

TratioT	8.56E-04	0.005	0.0012	8.53E-04	0.0062	3.86E-04	0.0023	0.005	0.0033	0.0016
BratioT	4.99E-04	0.0027	5.27E-04	3.52E-04	0.0034	3.07E-04	0.001	0.0027	0.002	4.79E-04
AratioT	1.25E-04	0.0018	9.05E-05	5.23E-05	0.0054	2.74E-04	0.0011	0.0018	0.0021	5.50E-04
GratioT	3.84E-04	0.3409	3.62E-04	1.79E-04	0.4259	0.0387	0.1226	0.3409	0.1945	0.0465
P4										
DratioT	0.7458	0.9819	0.6643	0.8715	0.9171	0.9071	0.9119	0.9819	0.9266	0.983
TratioT	0.002	4.82E-04	0.0029	0.0017	0.0024	0.0021	0.0041	4.82E-04	0.0041	0.0031
BratioT	0.0011	3.13E-04	0.0015	5.33E-04	0.0014	0.0018	0.002	3.13E-04	0.0022	7.02E-04
AratioT	8.99E-04	1.08E-04	0.0016	4.91E-04	0.0011	6.69E-04	8.98E-04	1.08E-04	8.55E-04	2.13E-04
GratioT	0.2503	0.0172	0.3297	0.1258	0.078	0.0883	0.081	0.0172	0.0663	0.013

Table 5.31 Variance in different bands of participant Four 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	6TH	14TH	18TH	21ST	17TH	19TH	3RD	3rd	7th	20th
DratioT	0.995	0.9921	0.9858	0.9938	0.9939	0.9938	0.9969	0.9802	0.9777	0.9707
TratioT	0.0026	0.004	0.0081	0.0036	0.0037	0.0033	0.0015	0.0092	0.011	0.0179
BratioT	0.0018	0.003	0.0048	0.0021	0.0019	0.0021	0.0013	0.0089	0.0092	0.0089
AratioT	3.01E-04	4.79E-04	7.50E-04	3.38E-04	3.04E-04	4.27E-04	1.92E-04	9.98E-04	0.0012	0.0014
GratioT	2.26E-04	3.93E-04	6.13E-04	2.60E-04	2.09E-04	3.47E-04	9.07E-05	7.73E-04	8.12E-04	0.0011
FZ										
DratioT	0.9976	0.9933	0.9963	0.9787	0.9942	0.9946	0.9944	0.9946	0.9785	0.9827
TratioT	0.0014	0.0038	0.0022	0.0124	0.004	0.0034	0.0029	0.0025	0.0118	0.0101
BratioT	8.57E-04	0.0025	0.0013	0.0074	0.0015	0.0015	0.0023	0.0026	0.0083	0.006
AratioT	1.01E-04	2.51E-04	1.25E-04	8.85E-04	1.72E-04	2.27E-04	2.60E-04	1.92E-04	7.59E-04	5.88E-04
GratioT	8.49E-05	2.37E-04	1.11E-04	6.94E-04	1.54E-04	2.21E-04	1.58E-04	1.55E-04	6.32E-04	6.14E-04
C3										
DratioT	0.9943	0.9742	0.9944	0.9723	0.9865	0.9505	0.9918	0.8909	0.9962	0.9803
TratioT	0.0028	0.0138	0.0029	0.0153	0.0076	0.0288	0.0039	0.0599	0.0021	0.0114

BratioT	0.0022	0.0087	0.0021	0.0098	0.0046	0.0147	0.0031	0.0414	0.0013	0.0067
AratioT	3.48E-04	0.0015	2.84E-04	0.0013	6.39E-04	0.0028	6.45E-04	0.0046	1.95E-04	9.21E-04
GratioT	4.07E-04	0.0019	3.16E-04	0.0013	6.91E-04	0.0032	5.85E-04	0.0033	1.24E-04	6.89E-04
C4										
DratioT	0.9875	0.982	0.9435	0.9779	0.9866	0.98	0.9934	0.9331	0.9633	0.9586
TratioT	0.0079	0.0096	0.0338	0.0129	0.0083	0.0103	0.0029	0.041	0.0202	0.0258
BratioT	0.0035	0.0068	0.0181	0.0073	0.0042	0.0076	0.003	0.0219	0.0143	0.0132
AratioT	6.39E-04	8.67E-04	0.0025	0.0012	5.53E-04	0.0012	4.48E-04	0.0026	0.0016	0.0016
GratioT	3.97E-04	7.15E-04	0.0021	7.94E-04	3.45E-04	8.24E-04	1.87E-04	0.0014	6.00E-04	8.70E-04
P3										
DratioT	0.9991	0.9985	0.995	0.9975	0.9978	0.9992	0.9972	0.998	0.9981	0.9983
TratioT	4.62E-04	8.62E-04	0.0028	0.0014	0.0011	3.60E-04	0.0014	0.0011	0.001	8.77E-04
BratioT	1.91E-04	3.51E-04	0.0011	5.65E-04	7.04E-04	1.92E-04	7.16E-04	5.27E-04	4.25E-04	4.02E-04
AratioT	4.01E-05	6.13E-05	2.04E-04	1.48E-04	8.41E-05	3.33E-05	1.52E-04	8.30E-05	8.67E-05	9.33E-05
GratioT	1.97E-04	2.55E-04	8.95E-04	4.13E-04	3.26E-04	1.80E-04	4.71E-04	3.11E-04	3.00E-04	3.28E-04
P4										
DratioT	0.5975	0.7793	0.714	0.45	0.8225	0.8003	0.5943	0.4261	0.3916	0.5419
TratioT	0.0034	0.0016	0.003	0.0065	0.0012	0.0017	0.0036	0.0059	0.0076	0.0066
BratioT	0.0023	6.03E-04	0.0025	0.0027	4.88E-04	8.77E-04	0.0017	0.0028	0.0033	0.0026
AratioT	0.0036	2.63E-04	0.0043	0.0032	4.53E-04	8.67E-04	0.0016	0.0033	0.0041	0.0052
GratioT	0.3932	0.2183	0.2762	0.5377	0.1754	0.1963	0.3988	0.562	0.5933	0.4437

Table 5.32 Variance in different bands of participant four next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9th	10th	13th	16th	1st	3rd	10th	7th	14th	16th
DratioT	0.96	0.9891	0.9888	0.9818	0.9699	0.8519	0.9376	0.9787	0.9948	0.6992
TratioT	0.0236	0.0072	0.0031	0.009	9.01E-04	0.0071	0.0028	0.0011	3.91E-04	0.0157
BratioT	0.0131	0.0031	0.0064	0.0072	5.81E-04	0.0064	0.0027	9.70E-04	2.60E-04	0.0108
AratioT	0.0018	3.56E-04	8.07E-04	9.19E-04	5.24E-04	9.53E-04	9.51E-04	3.01E-04	6.66E-05	0.0033

GratioT	0.0015	2.74E-04	9.10E-04	9.50E-04	0.0281	0.1337	0.056	0.0189	0.0045	0.271
FZ										
DratioT	0.9939	0.9938	0.9954	0.9968	0.9912	0.6235	0.8874	0.9894	0.9778	0.9348
TratioT	0.0037	0.0044	0.0018	0.0016	5.67E-04	0.0376	0.0119	0.0012	0.0037	0.0079
BratioT	0.002	0.0016	0.0023	0.0013	3.67E-04	0.0408	0.0132	0.0012	0.0027	0.007
AratioT	2.09E-04	1.38E-04	2.64E-04	1.39E-04	1.73E-04	0.0043	0.002	1.79E-04	4.19E-04	8.37E-04
GratioT	1.82E-04	1.18E-04	2.88E-04	1.32E-04	0.0077	0.2939	0.0855	0.008	0.0154	0.0496
C3										
DratioT	0.9889	0.9956	0.9699	0.9683	0.9715	0.9275	0.9023	0.9894	0.96	0.931
TratioT	0.0056	0.0026	0.0136	0.0149	8.15E-04	0.0025	0.0037	3.65E-04	0.0027	0.0049
BratioT	0.0046	0.0015	0.0119	0.0132	4.59E-04	0.0026	0.0032	3.59E-04	0.0019	0.0031
AratioT	5.31E-04	1.46E-04	0.0021	0.0018	4.01E-04	3.37E-04	9.19E-04	1.31E-04	3.54E-04	7.72E-04
GratioT	3.69E-04	1.04E-04	0.0025	0.0018	0.0269	0.0671	0.09	0.0098	0.035	0.0602
C4										
DratioT	0.9805	0.983	0.9794	0.8926	0.9922	0.9034	0.9727	0.9804	0.8341	0.9606
TratioT	0.0112	0.0113	0.0066	0.0598	2.99E-04	0.0066	0.0018	0.0014	0.0228	0.005
BratioT	0.0072	0.0049	0.0076	0.0407	2.14E-04	0.0062	0.002	0.0012	0.0128	0.0026
AratioT	7.47E-04	5.61E-04	0.0024	0.004	1.38E-04	7.96E-04	4.38E-04	3.04E-04	0.0024	5.22E-04
GratioT	4.00E-04	2.81E-04	0.004	0.0029	0.0072	0.083	0.0231	0.0168	0.1279	0.0313
P3										
DratioT	0.9993	0.9965	0.9995	0.9981	0.9078	0.8967	0.7047	0.945	0.9689	0.4864
TratioT	2.66E-04	0.002	1.76E-04	8.56E-04	0.0015	0.0016	0.0047	9.31E-04	7.61E-04	0.0092
BratioT	2.24E-04	9.42E-04	1.25E-04	4.99E-04	6.59E-04	6.95E-04	0.0024	4.88E-04	3.33E-04	0.0048
AratioT	4.25E-05	1.33E-04	3.47E-05	1.25E-04	0.0011	2.30E-04	0.0021	6.43E-04	1.86E-04	0.0052
GratioT	1.40E-04	4.44E-04	1.18E-04	3.84E-04	0.089	0.1007	0.286	0.053	0.0298	0.4946
P4										
DratioT	0.5627	0.5829	0.8285	0.7458	0.8781	0.9649	0.9299	0.9606	0.8492	0.9911
TratioT	0.0058	0.0041	0.0013	0.002	0.0038	0.0011	0.0029	0.0019	0.0111	5.99E-04
BratioT	0.003	0.0028	0.0011	0.0011	0.0024	9.50E-04	0.0017	7.59E-04	0.0051	2.09E-04

AratioT	0.0059	0.0017	7.55E-04	8.99E-04	0.0019	1.90E-04	7.16E-04	5.47E-04	0.0012	1.08E-04
GratioT	0.4226	0.4085	0.1684	0.2503	0.1138	0.0328	0.0648	0.0362	0.1332	0.008

POWER: Now power is extracted in all bands and all the results are shown below.

Table 5.33 Power in different bands of participant one 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2ND	10TH	20TH	4TH	9TH	5TH	23RD	6th	8th	19th
DratioT	0.2836	0.3297	0.6729	0.3308	0.536	0.7027	0.2963	0.3001	0.4151	0.3569
TratioT	0.0093	0.0193	0.0074	0.0138	0.0089	0.0059	0.0164	0.0223	0.0269	0.0275
BratioT	0.0106	0.0102	0.0051	0.01	0.0019	0.0027	0.0042	0.013	0.0071	0.0089
AratioT	0.0112	0.0179	0.0055	0.0091	0.0095	0.0041	0.0206	0.0381	0.0269	0.0414
GratioT	0.6854	0.623	0.3091	0.6363	0.4438	0.2846	0.6625	0.6265	0.524	0.5654
Fz										
DratioT	0.4229	0.3055	0.2485	0.4116	0.6342	0.3176	0.3685	0.4857	0.6481	0.457
TratioT	0.0124	0.0421	0.0504	0.0246	0.0183	0.0278	0.0263	0.0464	0.0308	0.0444
BratioT	0.0076	0.0115	0.0109	0.0085	0.0026	0.0083	0.0043	0.0115	0.006	0.0109
AratioT	0.0233	0.0543	0.0459	0.0208	0.0166	0.0216	0.0306	0.07	0.0447	0.0763
GratioT	0.5338	0.5865	0.6443	0.5344	0.3283	0.6247	0.5703	0.3864	0.2704	0.4113
C3										
DratioT	0.3919	0.2297	0.3968	0.4063	0.6577	0.2984	0.2642	0.354	0.4916	0.175
TratioT	0.0147	0.0427	0.0372	0.028	0.0158	0.0286	0.0361	0.0234	0.0185	0.0262
BratioT	0.009	0.0122	0.009	0.0083	0.0017	0.0064	0.0036	0.0115	0.0047	0.0109
AratioT	0.014	0.0238	0.0194	0.0144	0.0074	0.0143	0.0209	0.0336	0.0256	0.033
GratioT	0.5704	0.6915	0.5376	0.5429	0.3174	0.6524	0.6752	0.5774	0.4596	0.7548
C4										
DratioT	0.5681	0.5248	0.7147	0.5477	0.4035	0.7019	0.6446	0.7491	0.4622	0.5428
TratioT	0.0047	0.0079	0.0074	0.0099	0.0153	0.0077	0.0106	0.017	0.036	0.0282
BratioT	0.0057	0.0071	0.0039	0.0068	0.0037	0.0031	0.0015	0.0046	0.0086	0.0074
AratioT	0.0044	0.0054	0.0101	0.0096	0.0174	0.0064	0.013	0.0252	0.0486	0.0501

GratioT	0.4171	0.4548	0.2639	0.4259	0.5601	0.2809	0.3303	0.2041	0.4446	0.3714
P3										
DratioT	0.2912	0.1741	0.6318	0.4143	0.9473	0.7502	0.4902	0.5945	0.292	0.6669
TratioT	0.0112	0.0267	0.0048	0.0086	5.21E-04	0.0029	0.0052	0.0047	0.0132	0.0048
BratioT	0.0092	0.0133	0.0046	0.0081	1.93E-04	0.0016	9.25E-04	0.0062	0.0051	0.0037
AratioT	0.0187	0.039	0.0034	0.0045	2.75E-04	0.0016	0.0026	0.0068	0.0117	0.0032
GratioT	0.6696	0.7469	0.3554	0.5645	0.0517	0.2437	0.5011	0.3878	0.6781	0.3214
P4										
DratioT	0.5559	0.7541	0.7191	0.6757	0.7815	0.801	0.6192	0.4137	0.3297	0.533
TratioT	0.0165	0.0131	0.0158	0.0131	0.0093	0.0074	0.0288	0.0224	0.0209	0.0181
BratioT	0.007	0.0039	0.005	0.0054	0.0012	0.0016	0.0029	0.009	0.0065	0.0067
AratioT	0.009	0.0077	0.0112	0.0095	0.0049	0.0035	0.0162	0.025	0.0292	0.0228
GratioT	0.4116	0.2213	0.2489	0.2963	0.203	0.1864	0.3329	0.53	0.6137	0.4194

Table 5.34 Power in different bands of participant one Next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1 st	4 th	5 th	14 th	6 th	11 th	8 th	4 th	5 th	28 th
DratioT	0.7926	0.7232	0.757	0.647	0.9648	0.8027	0.9301	0.7618	0.9746	0.966
TratioT	0.0058	0.0105	0.011	0.0187	0.0123	0.0737	0.0267	0.0873	0.0077	0.0124
BratioT	0.0015	0.0034	0.0042	0.0057	0.0033	0.0138	0.0039	0.0178	0.0017	0.0023
AratioT	0.007	0.0096	0.0168	0.0156	0.0087	0.0481	0.021	0.0656	0.0092	0.0119
GratioT	0.1932	0.2532	0.211	0.3129	0.0109	0.0616	0.0183	0.0675	0.0068	0.0074
Fz										
DratioT	0.865	0.6658	0.7044	0.8357	0.9396	0.9881	0.897	0.9112	0.8173	0.8411
TratioT	0.0078	0.0277	0.0283	0.019	0.0266	0.0053	0.0433	0.0284	0.0533	0.0484
BratioT	0.0015	0.0054	0.0052	0.0032	0.0035	6.15E-04	0.0043	0.0051	0.0103	0.0082
AratioT	0.0136	0.0305	0.044	0.0222	0.0229	0.0046	0.0464	0.0452	0.1034	0.0884
GratioT	0.1121	0.2705	0.2181	0.1199	0.0074	0.0014	0.0091	0.0101	0.0156	0.0138

C3										
DratioT	0.6809	0.2168	0.3437	0.7092	0.957	0.9318	0.9612	0.9775	0.8927	0.9762
TratioT	0.0072	0.0223	0.0242	0.0136	0.0157	0.0237	0.0142	0.0078	0.0302	0.0063
BratioT	0.0021	0.0068	0.0096	0.0044	0.0027	0.0045	0.0024	0.0014	0.0062	0.0014
AratioT	0.0132	0.0225	0.0319	0.0138	0.0135	0.0192	0.0127	0.007	0.0468	0.0084
GratioT	0.2967	0.7316	0.5906	0.259	0.0111	0.0208	0.0094	0.0062	0.0241	0.0078
C4										
DratioT	0.6735	0.315	0.2358	0.4885	0.9533	0.9346	0.9318	0.9917	0.9247	0.8896
TratioT	0.0126	0.0399	0.0585	0.041	0.0231	0.0258	0.0265	0.0028	0.0287	0.026
BratioT	0.0031	0.0112	0.0131	0.009	0.0028	0.0037	0.0034	5.75E-04	0.0046	0.0064
AratioT	0.0202	0.0473	0.0759	0.0419	0.0152	0.0287	0.0324	0.0039	0.0354	0.0673
GratioT	0.2906	0.5865	0.6167	0.4195	0.0056	0.0071	0.0058	9.22E-04	0.0066	0.0107
P3										
DratioT	0.5386	0.4203	0.5917	0.405	0.9164	0.9952	0.8905	0.917	0.9914	0.9616
TratioT	0.0046	0.0081	0.0073	0.0118	0.0295	0.0015	0.0398	0.0323	0.0029	0.0146
BratioT	0.0025	0.0034	0.0057	0.0076	0.0065	3.27E-04	0.0085	0.0052	5.60E-04	0.0025
AratioT	0.0071	0.006	0.005	0.0117	0.0236	0.0013	0.0286	0.021	0.0024	0.0103
GratioT	0.4471	0.5622	0.3903	0.5639	0.024	0.0016	0.0326	0.0246	0.0028	0.0109
P4										
DratioT	0.8238	0.5738	0.2182	0.4178	0.9519	0.9845	0.9503	0.987	0.953	0.8653
TratioT	0.0037	0.0172	0.0236	0.0223	0.0225	0.0057	0.0211	0.0044	0.0209	0.0421
BratioT	0.0013	0.0047	0.0143	0.0072	0.0037	0.0011	0.003	0.0011	0.0026	0.008
AratioT	0.0057	0.0156	0.0325	0.029	0.0163	0.0068	0.0202	0.0056	0.0183	0.071
GratioT	0.1656	0.3888	0.7113	0.5237	0.0056	0.0019	0.0054	0.0018	0.0052	0.0137

Table 5.35 Power in different bands of participant one 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	21ST	17TH	19TH	3RD	6TH	14TH	18TH	3rd	7th	20th
DratioT	0.1809	0.5614	0.3216	0.4046	0.556	0.3878	0.5649	0.3761	0.4973	0.9234
TratioT	0.0232	0.0069	0.0177	0.0075	0.0102	0.0132	0.0067	0.0289	0.0149	0.0033
BratioT	0.0041	0.0033	0.0032	0.0018	0.0063	0.0046	0.0028	0.0108	0.0082	0.001
AratioT	0.0239	0.006	0.0208	0.0086	0.0079	0.0165	0.007	0.0358	0.0245	0.0043
GratioT	0.768	0.4226	0.6367	0.5774	0.4197	0.5779	0.4186	0.5484	0.455	0.0679
Fz										
DratioT	0.4073	0.4729	0.2927	0.2084	0.4142	0.2498	0.2982	0.4312	0.4024	0.8256
TratioT	0.0217	0.0279	0.0201	0.038	0.0251	0.0619	0.0309	0.0584	0.0446	0.0217
BratioT	0.009	0.0059	0.0042	0.0042	0.0045	0.0043	0.003	0.0116	0.0121	0.0032
AratioT	0.0229	0.0271	0.0323	0.0625	0.0199	0.0555	0.0346	0.0802	0.0668	0.0248
GratioT	0.5393	0.4662	0.6508	0.687	0.5364	0.6286	0.6333	0.4185	0.4741	0.1248
C3										
DratioT	0.4975	0.3769	0.4484	0.2779	0.4052	0.365	0.461	0.2431	0.5717	0.7808
TratioT	0.024	0.0275	0.0187	0.037	0.0228	0.0429	0.0194	0.0325	0.0119	0.0063
BratioT	0.0081	0.0049	0.0035	0.0038	0.0039	0.0033	0.0022	0.0125	0.0067	0.003
AratioT	0.014	0.0144	0.0118	0.0304	0.012	0.0211	0.012	0.041	0.0175	0.0092
GratioT	0.4564	0.5763	0.5177	0.6508	0.5561	0.5677	0.5054	0.6708	0.3922	0.2007
C4										
DratioT	0.739	0.5364	0.7586	0.5932	0.833	0.43	0.3529	0.6373	0.4078	0.6038
TratioT	0.0039	0.0048	0.0039	0.0144	0.0033	0.0301	0.0135	0.023	0.0302	0.0256
BratioT	0.0037	0.0026	0.001	0.0016	0.001	0.0021	0.0021	0.0073	0.0097	0.0059
AratioT	0.0027	0.0026	0.0069	0.0166	0.0035	0.027	0.0161	0.0376	0.044	0.0403
GratioT	0.2507	0.4536	0.2296	0.3742	0.1592	0.5108	0.6153	0.2948	0.5082	0.3244
P3										
DratioT	0.6885	0.6647	0.8475	0.5831	0.6919	0.674	0.2932	0.4319	0.6934	0.6156

TratioT	0.0067	0.0108	0.001	0.0051	0.0019	0.0037	0.0068	0.0084	0.0051	0.0057
BratioT	0.0047	0.0029	7.27E-04	0.001	0.001	7.87E-04	0.0013	0.0083	0.0046	0.0042
AratioT	0.0064	0.012	9.13E-04	0.0037	0.0025	0.0026	0.0032	0.0071	0.0032	0.0053
GratioT	0.2937	0.3096	0.1499	0.4071	0.3026	0.3188	0.6954	0.5443	0.2937	0.3692
P4										
DratioT	0.8711	0.3679	0.3961	0.482	0.5948	0.413	0.5959	0.1685	0.2594	0.7537
TratioT	0.0052	0.0349	0.0278	0.0369	0.0179	0.0391	0.0152	0.0297	0.0263	0.0087
BratioT	0.002	0.005	0.0061	0.0044	0.0037	0.0047	0.002	0.0149	0.0101	0.0029
AratioT	0.0031	0.0219	0.019	0.0217	0.0116	0.0203	0.0087	0.0482	0.0323	0.0135
GratioT	0.1185	0.5703	0.551	0.455	0.3719	0.523	0.3782	0.7387	0.6719	0.2212

Table 5.36 Power in different bands of participant one next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9th	10th	13th	16th	1st	3rd	10th	7th	14th	16th
DratioT	0.6489	0.8279	0.7642	0.7469	0.9746	0.9868	0.9451	0.989	0.9654	0.9357
TratioT	0.0133	0.008	0.0124	0.0124	0.0077	0.0042	0.0226	0.0032	0.0126	0.0246
BratioT	0.0069	0.002	0.0024	0.0038	0.0017	7.06E-04	0.0037	7.14E-04	0.0023	0.0053
AratioT	0.0143	0.01	0.0158	0.0126	0.0092	0.0046	0.0145	0.0038	0.0116	0.0186
GratioT	0.3166	0.152	0.2053	0.2243	0.0068	0.0037	0.0141	0.0033	0.0081	0.0158
Fz										
DratioT	0.429	0.6985	0.7738	0.3362	0.8173	0.7172	0.9897	0.9247	0.9654	0.9292
TratioT	0.0495	0.0299	0.0241	0.0113	0.0533	0.0954	0.0045	0.0252	0.0132	0.0232
BratioT	0.013	0.0046	0.0035	0.0103	0.0103	0.0124	4.87E-04	0.0037	0.0016	0.0041
AratioT	0.0712	0.0484	0.0382	0.009	0.1034	0.1528	0.0044	0.0377	0.017	0.0368
GratioT	0.4373	0.2186	0.1605	0.6332	0.0156	0.0222	8.55E-04	0.0086	0.0028	0.0067
C3										
DratioT	0.4984	0.8307	0.2652	0.1652	0.8927	0.923	0.9848	0.7837	0.9874	0.9283
TratioT	0.0178	0.0065	0.0269	0.0324	0.0302	0.0234	0.006	0.0633	0.0038	0.0245
BratioT	0.0093	0.0018	0.0061	0.0116	0.0062	0.0041	8.54E-04	0.0114	7.23E-04	0.0034

AratioT	0.0281	0.0103	0.0476	0.0604	0.0468	0.0327	0.005	0.079	0.0049	0.0252
GratioT	0.4464	0.1506	0.6542	0.7305	0.0241	0.0168	0.0033	0.0625	0.0032	0.0186
C4										
DratioT	0.764	0.4375	0.5697	0.5998	0.9247	0.9512	0.9892	0.9923	0.9872	0.9722
TratioT	0.016	0.0336	0.0383	0.0273	0.0287	0.0178	0.0047	0.0026	0.0051	0.0117
BratioT	0.0046	0.0079	0.0058	0.007	0.0046	0.0026	7.77E-04	4.25E-04	6.75E-04	0.0018
AratioT	0.0195	0.0575	0.0488	0.0387	0.0354	0.0241	0.0042	0.0038	0.006	0.0118
GratioT	0.1959	0.4636	0.3374	0.3273	0.0066	0.0043	0.001	8.34E-04	0.001	0.0026
P3										
DratioT	0.3216	0.1845	0.2989	0.4411	0.9914	0.9888	0.9926	0.9879	0.9889	0.9916
TratioT	0.0096	0.0098	0.012	0.0114	0.0029	0.0038	0.0029	0.0039	0.004	0.0032
BratioT	0.0107	0.0068	0.004	0.008	5.60E-04	6.38E-04	5.61E-04	9.43E-04	7.83E-04	5.21E-04
AratioT	0.0124	0.0137	0.0119	0.0125	0.0024	0.0035	0.002	0.0027	0.0033	0.0022
GratioT	0.6457	0.7851	0.6732	0.527	0.0028	0.0032	0.0019	0.0045	0.0031	0.0024
P4										
DratioT	0.5583	0.36	0.2239	0.6684	0.953	0.9572	0.9902	0.9886	0.9195	0.993
TratioT	0.0185	0.0222	0.0362	0.0106	0.0209	0.0154	0.0038	0.0037	0.0352	0.0026
BratioT	0.0074	0.0066	0.0058	0.0062	0.0026	0.0025	7.96E-04	7.26E-04	0.0058	5.01E-04
AratioT	0.0212	0.04	0.0537	0.0158	0.0183	0.0198	0.0043	0.0057	0.0315	0.0032
GratioT	0.3946	0.5712	0.6804	0.299	0.0052	0.0052	8.74E-04	0.0013	0.008	8.02E-04

Table 5.37 Power in different bands of participant Two 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2ND	10TH	20TH	4TH	9TH	5TH	23RD	6th	8th	19th
DratioT	0.855	0.9909	0.9802	0.9284	0.9789	0.9206	0.9498	0.817	0.922	0.8669
TratioT	0.0031	8.24E-04	4.38E-04	0.0045	0.002	0.009	7.61E-04	0.0052	0.0028	0.004
BratioT	0.0031	4.27E-04	2.64E-04	0.0025	7.99E-04	0.003	5.19E-04	0.0029	0.0019	0.0034
AratioT	0.0032	4.95E-04	4.48E-04	0.0068	0.0016	0.0057	6.12E-04	0.0061	0.0022	0.0038

GratioT	1.36E-01	7.30E-03	0.0186	0.0579	0.0168	0.0618	0.0483	0.1689	0.0711	0.1219
Fz										
DratioT	0.8408	0.9648	0.9729	0.9786	0.9735	0.9147	0.5721	0.9144	0.7998	0.7163
TratioT	0.0123	0.0031	6.22E-04	0.0019	0.0031	0.0099	0.0098	0.0044	0.0106	0.0205
BratioT	0.0058	0.0019	4.04E-04	0.0011	0.0012	0.0044	0.0064	0.0028	0.0071	0.0123
AratioT	0.0067	0.0019	7.25E-04	0.002	0.002	0.0066	0.0056	0.0033	0.0084	0.0106
GratioT	0.1344	0.0283	0.0253	0.0164	0.0202	0.0645	0.406	0.0751	0.1741	0.2403
C3										
DratioT	0.9276	0.9546	0.9973	0.9385	0.935	0.9137	0.9872	0.97	0.9771	0.8834
TratioT	0.0057	0.0035	2.56E-04	0.0036	0.0048	0.009	0.0013	0.0082	0.0063	0.0308
BratioT	0.0026	0.0014	9.23E-05	0.0029	0.0016	0.0029	5.52E-04	0.0031	0.0021	0.0087
AratioT	0.0033	0.0022	1.64E-04	0.0036	0.0039	0.0038	7.22E-04	0.0055	0.0041	0.0199
GratioT	0.0609	0.0383	0.0022	0.0515	0.0547	0.0706	0.0102	0.0132	0.0104	0.0573
C4										
DratioT	0.8476	0.9923	0.9833	0.9388	0.9774	0.9466	0.9361	0.8203	0.8524	0.9498
TratioT	0.0037	7.96E-04	5.29E-04	0.0046	0.0018	0.0057	0.0015	0.0105	0.0077	0.0025
BratioT	0.0037	3.49E-04	2.83E-04	0.0026	9.97E-04	0.0025	8.02E-04	0.0038	0.0044	0.0016
AratioT	0.0034	6.42E-04	5.42E-04	0.0091	0.0028	0.0055	0.0014	0.0113	0.0079	0.0025
GratioT	0.1416	0.0059	0.0154	0.0449	0.0169	0.0398	0.0603	0.1541	0.1276	0.0436
P3										
DratioT	0.9847	0.9966	0.9987	0.9706	0.9838	0.4269	0.9868	0.9923	0.8555	0.9888
TratioT	4.14E-04	1.06E-04	8.91E-05	0.0011	6.04E-04	0.0195	7.33E-04	6.75E-04	0.016	0.0022
BratioT	2.99E-04	5.32E-05	1.11E-05	3.22E-04	2.33E-04	0.0098	7.56E-05	1.90E-04	0.0047	3.76E-04
AratioT	3.99E-04	7.92E-05	4.42E-05	6.79E-04	3.99E-04	0.0134	2.60E-04	3.66E-04	0.008	7.92E-04
GratioT	0.0142	0.0031	0.0011	0.0273	0.015	0.5303	0.0121	0.0065	0.1157	0.0079
P4										
DratioT	0.8637	0.9946	0.9893	0.9808	0.9824	0.963	0.9017	0.6771	0.5389	0.9816
TratioT	0.002	4.64E-04	2.26E-04	0.0013	0.0013	0.002	0.0025	0.0092	0.0169	4.92E-04
BratioT	0.0023	1.90E-04	1.21E-04	8.24E-04	7.25E-04	0.0012	7.13E-04	0.0037	0.0104	4.60E-04

AratioT	0.0015	4.28E-04	2.89E-04	0.0018	0.0019	0.0037	0.0017	0.0095	0.0152	5.81E-04
GratioT	0.1305	0.0043	0.0101	0.0154	0.0137	0.03	0.0934	0.3006	0.4187	0.0169

Table 5.38 Power in different bands of participant Two next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1 st	4 th	5 th	14 th	6 th	11 th	8 th	4 th	5 th	28 th
DratioT	0.8102	0.963	0.9238	0.8814	0.7938	0.9139	0.9176	0.898	0.866	0.9429
TratioT	0.0129	0.0014	0.0025	0.0048	0.0327	0.016	0.0153	0.0208	0.0269	0.018
BratioT	0.0048	7.44E-04	0.0018	0.0028	0.0116	0.0043	0.0049	0.0052	0.0056	0.0026
AratioT	0.0065	0.0011	0.0024	0.0045	0.0208	0.0065	0.0072	0.0104	0.0099	0.0065
GratioT	0.1657	0.0337	0.0695	0.1065	0.141	0.0593	0.055	0.0657	0.0916	0.03
Fz										
DratioT	0.9118	0.9553	0.7334	0.8886	0.8258	0.9209	0.9963	0.9768	0.9409	0.9497
TratioT	0.0052	0.0026	0.0185	0.0072	0.042	0.0226	9.92E-04	0.0065	0.0163	0.0216
BratioT	0.0034	0.0016	0.0093	0.0037	0.0106	0.0046	2.57E-04	0.0013	0.0033	0.0024
AratioT	0.0042	0.0019	0.0119	0.0058	0.0246	0.0083	4.75E-04	0.0031	0.006	0.0073
GratioT	0.0755	0.0386	0.2269	0.0947	0.097	0.0435	0.002	0.0123	0.0335	0.0191
C3										
DratioT	0.9899	0.9919	0.949	0.9549	0.7264	0.7169	0.9703	0.9295	0.7935	0.8635
TratioT	0.0033	0.0021	0.0116	0.0181	0.116	0.1196	0.0124	0.0304	0.0854	0.0786
BratioT	7.06E-04	0.0011	0.0059	0.0035	0.0104	0.0106	0.0013	0.0024	0.0062	0.0045
AratioT	0.0019	0.0015	0.0093	0.0079	0.0602	0.064	0.0063	0.0148	0.0468	0.0271
GratioT	0.0042	0.0032	0.0243	0.0156	0.0869	0.0889	0.0097	0.0229	0.0682	0.0264
C4										
DratioT	0.8475	0.9549	0.8872	0.9013	0.7906	0.8442	0.9756	0.942	0.8524	0.7891
TratioT	0.011	0.0022	0.0057	0.0069	0.1139	0.0885	0.0141	0.0325	0.0829	0.1416
BratioT	0.0048	0.0011	0.0032	0.0027	0.0092	0.0072	0.0011	0.0023	0.0055	0.0078
AratioT	0.0085	0.0023	0.0062	0.0071	0.0612	0.0407	0.0063	0.0168	0.0413	0.0478
GratioT	0.1282	0.0396	0.0978	0.0819	0.025	0.0195	0.0029	0.0064	0.0179	0.0136

P3										
DratioT	0.9799	0.9977	0.9342	0.9819	0.994	0.9822	0.9939	0.9941	0.9945	0.8098
TratioT	0.002	3.07E-04	0.0068	0.003	2.89E-04	0.0017	3.16E-04	2.93E-04	2.58E-04	0.0222
BratioT	5.17E-04	4.80E-05	0.0022	4.78E-04	6.45E-05	1.84E-04	7.86E-05	4.19E-05	2.65E-05	0.0026
AratioT	0.0013	1.57E-04	0.004	0.0016	1.76E-04	5.08E-04	1.89E-04	1.54E-04	1.21E-04	0.0109
GratioT	0.0164	0.0018	0.0527	0.013	0.0055	0.0154	0.0056	0.0055	0.0051	0.1546
P4										
DratioT	0.9087	0.9443	0.2975	0.8753	0.9084	0.9786	0.9885	0.9915	0.9423	0.9992
TratioT	0.0029	0.0015	0.0192	0.0035	0.0443	0.0108	0.0061	0.0044	0.0302	5.27E-04
BratioT	0.0022	7.91E-04	0.0135	0.0026	0.0038	9.98E-04	5.48E-04	3.81E-04	0.0023	3.38E-05
AratioT	0.0029	0.0021	0.0226	0.0064	0.0144	0.0031	0.0018	0.0018	0.0078	1.54E-04
GratioT	0.0833	0.0514	0.6472	0.1123	0.0292	0.0065	0.0031	0.002	0.0175	8.13E-05

Table 5.39 Power in different bands of participant Two 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	21ST	17TH	19TH	3RD	6TH	14TH	18TH	3rd	7th	20th
DratioT	0.9769	0.9463	0.9914	0.7951	0.5485	0.9805	0.8481	0.9765	0.9645	0.8264
TratioT	0.0021	0.0035	1.67E-04	0.0029	0.0073	2.86E-04	0.012	9.33E-04	0.0024	0.0089
BratioT	0.001	0.0024	9.72E-05	0.0016	0.004	1.39E-04	0.006	6.23E-04	9.20E-04	0.004
AratioT	0.0013	0.0035	1.51E-04	0.0025	0.0042	2.58E-04	0.007	7.54E-04	0.0012	0.0053
GratioT	1.87E-02	4.42E-02	0.0082	0.1979	0.436	0.0189	0.1269	0.0211	0.0309	0.1554
Fz										
DratioT	0.7916	0.7694	0.987	0.4217	0.6474	0.97	0.5423	0.9275	0.723	0.8332
TratioT	0.0244	0.0212	2.75E-04	0.0127	0.0072	4.96E-04	0.0495	0.0053	0.0193	0.018
BratioT	0.011	0.0124	1.92E-04	0.0062	0.0038	2.74E-04	0.0234	0.0029	0.0096	0.0056
AratioT	0.0132	0.0151	2.44E-04	0.0077	0.004	4.30E-04	0.0288	0.0037	0.0116	0.0083
GratioT	0.1597	0.182	0.0123	0.5518	0.3376	0.0288	0.3559	0.0606	0.2364	0.1349

C3										
DratioT	0.8945	0.8338	0.9983	0.9476	0.9192	0.9977	0.8998	0.9955	0.9821	0.9379
TratioT	0.0086	0.0088	1.87E-04	0.0044	0.0068	2.03E-04	0.0106	0.0015	0.0095	0.0144
BratioT	0.003	0.0065	5.73E-05	0.0015	0.0031	7.74E-05	0.0028	3.34E-04	0.0012	0.0061
AratioT	0.0048	0.0077	9.09E-05	0.0031	0.0037	1.53E-04	0.0061	0.001	0.0031	0.0102
GratioT	0.0891	0.1432	0.0014	0.0435	0.0672	0.0019	0.0806	0.0017	0.0041	0.0315
C4										
DratioT	0.9744	0.9497	0.9929	0.785	0.5403	0.9852	0.8954	0.962	0.9595	0.8258
TratioT	0.0022	0.0045	1.60E-04	0.0046	0.01	3.01E-04	0.0095	0.002	0.0102	0.0148
BratioT	0.0014	0.0023	9.65E-05	0.002	0.0053	1.29E-04	0.0042	0.0011	0.0013	0.0043
AratioT	0.0025	0.0049	1.89E-04	0.0047	0.0062	3.16E-04	0.0068	0.0018	0.004	0.0089
GratioT	0.0196	0.0386	0.0067	0.2037	0.4382	0.0141	0.0841	0.0332	0.0249	0.1462
P3										
DratioT	0.9467	0.9655	0.9994	0.5361	0.9795	0.9992	0.8974	0.9965	0.9926	0.9827
TratioT	0.0015	0.0012	4.07E-05	0.0253	0.0015	4.45E-05	0.0043	3.98E-04	0.0031	0.0017
BratioT	0.0012	2.96E-04	5.35E-06	0.0026	2.40E-04	5.63E-06	0.0018	8.24E-05	2.10E-04	6.74E-04
AratioT	0.0011	6.59E-04	2.04E-05	0.0108	6.59E-04	1.75E-05	0.0025	2.33E-04	6.04E-04	0.0011
GratioT	0.0495	0.0324	5.67E-04	0.4252	0.0181	7.65E-04	0.0939	0.0027	0.0034	0.0138
P4										
DratioT	0.9901	0.9744	0.9934	0.4314	0.8268	0.9923	0.9392	0.8842	0.9582	0.8811
TratioT	6.19E-04	0.0019	9.74E-05	0.0133	0.0028	9.65E-05	0.0031	0.0032	0.0058	0.0048
BratioT	4.37E-04	8.56E-04	5.50E-05	0.0038	0.0018	4.64E-05	0.0013	0.0021	0.0013	0.0027
AratioT	8.15E-04	0.0026	1.00E-04	0.0103	0.0017	1.23E-04	0.0025	0.0039	0.0024	0.0045
GratioT	0.0081	0.0203	0.0064	0.5413	0.167	0.0074	0.0539	0.1066	0.0323	0.107

Table 5.40 Power in different bands of participant two next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9 th	10 th	13th	16th	1st	3 rd	10th	7th	14th	16 th
DratioT	0.9451	0.8287	0.8013	0.6634	0.8685	0.8976	0.8101	0.8549	0.6497	0.7528
TratioT	0.0018	0.0058	0.0091	0.0155	0.0179	0.0236	0.0392	0.0259	0.1103	0.0881
BratioT	0.0014	0.0026	0.005	0.0088	0.0079	0.0049	0.0093	0.0073	0.015	0.0117
AratioT	0.0024	0.0054	0.0088	0.0125	0.009	0.0075	0.0158	0.0107	0.056	0.0244
GratioT	0.0493	0.1576	0.1759	0.2998	0.0966	0.0665	0.1255	0.1013	0.169	0.123
Fz										
DratioT	0.8021	0.8338	0.8589	0.8607	0.9876	0.877	0.9704	0.8738	0.9825	0.983
TratioT	0.0162	0.012	0.0116	0.014	0.0028	0.0334	0.0087	0.038	0.0077	0.0071
BratioT	0.0066	0.0049	0.0047	0.0049	8.87E-04	0.0075	0.0019	0.0081	8.49E-04	9.75E-04
AratioT	0.0125	0.0089	0.0076	0.0088	0.0011	0.0115	0.0033	0.0124	0.0027	0.0021
GratioT	0.1627	0.1404	0.1172	0.1117	0.0076	0.0707	0.0156	0.0676	0.0063	0.0069
C3										
DratioT	0.9818	0.9352	0.9219	0.9811	0.956	0.6438	0.8188	0.7713	0.8137	0.5315
TratioT	0.0053	0.0223	0.0415	0.0043	0.015	0.145	0.1065	0.0949	0.1127	0.3014
BratioT	0.0021	0.0066	0.0051	0.002	0.0013	0.0111	0.0066	0.0092	0.0062	0.0173
AratioT	0.004	0.0119	0.0148	0.004	0.0067	0.0769	0.0294	0.0467	0.0427	0.0889
GratioT	0.0069	0.0241	0.0168	0.0086	0.021	0.1233	0.0388	0.0778	0.0247	0.061
C4										
DratioT	0.9223	0.8302	0.7354	0.7117	0.8336	0.7254	0.7039	0.7365	0.9273	0.7157
TratioT	0.0034	0.0071	0.0552	0.0223	0.0846	0.1403	0.2011	0.1427	0.0474	0.2015
BratioT	0.0022	0.0032	0.0092	0.0084	0.0082	0.0104	0.0107	0.0126	0.0027	0.0102
AratioT	0.0052	0.0102	0.0264	0.016	0.0402	0.089	0.0611	0.0748	0.0189	0.059
GratioT	0.0669	0.1493	0.1738	0.2416	0.0334	0.0349	0.0232	0.0335	0.0037	0.0135
P3										
DratioT	0.9815	0.9784	0.9866	0.9691	0.9878	0.987	0.9689	0.9942	0.9728	0.8098
TratioT	0.0025	0.0027	0.0025	0.007	3.97E-04	6.69E-04	0.0034	3.04E-04	0.0038	0.0222
BratioT	7.10E-04	5.74E-04	4.17E-04	8.72E-04	9.16E-05	8.08E-05	3.09E-04	4.51E-05	4.41E-04	0.0026

AratioT	0.0012	0.0016	9.22E-04	0.0033	2.83E-04	2.55E-04	1.00E-03	1.52E-04	0.0017	0.0109
GratioT	0.0141	0.0167	0.0095	0.0196	0.0115	0.012	0.0264	0.0053	0.0213	0.1546
P4										
DratioT	0.6867	0.9343	0.7731	0.7754	0.9534	0.9879	0.996	0.9732	0.9887	0.9429
TratioT	0.0096	0.0017	0.0225	0.0071	0.0179	0.0065	0.0024	0.0127	0.0069	0.0409
BratioT	0.0067	9.51E-04	0.0066	0.0053	0.0026	5.49E-04	1.47E-04	0.0015	4.10E-04	0.0023
AratioT	0.0129	0.0024	0.0138	0.0082	0.0055	0.0018	5.95E-04	0.004	0.0029	0.0087
GratioT	0.2841	0.0607	0.184	0.204	0.0207	0.0032	8.47E-04	0.0086	0.0011	0.0052

Table 5.41 Power in different bands of participant Three 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2ND	10TH	20TH	4TH	9TH	5TH	23RD	6th	8th	19th
DratioT	0.9564	0.7582	0.8288	0.9558	0.8606	0.8975	0.9499	0.9316	0.9336	0.996
TratioT	0.0093	0.0448	0.0523	0.0092	0.0305	0.0181	0.0137	0.0274	0.0238	0.0016
BratioT	0.0012	0.0071	0.0063	0.0013	0.0047	0.0038	0.0026	0.0043	0.0043	2.22E-04
AratioT	0.0039	0.0236	0.0225	0.0044	0.0145	0.0073	0.0057	0.0109	0.0117	8.28E-04
GratioT	0.0291	0.1662	0.0901	0.0293	0.0897	0.0733	0.0281	0.0258	0.0266	0.0013
Fz										
DratioT	0.9738	0.8927	0.8916	0.9687	0.959	0.9561	0.8597	0.9528	0.8792	0.9407
TratioT	0.0072	0.0344	0.0411	0.0091	0.0127	0.0125	0.0459	0.0215	0.0471	0.026
BratioT	0.0011	0.0039	0.0053	0.0012	0.0017	0.0022	0.008	0.0035	0.0096	0.0041
AratioT	0.0032	0.0146	0.0215	0.0046	0.0059	0.0045	0.0218	0.0104	0.0265	0.0155
GratioT	0.0146	0.0544	0.0405	0.0164	0.0207	0.0247	0.0646	0.0119	0.0375	0.0137
C3										
DratioT	0.9586	0.7762	0.8015	0.8259	0.8721	0.8527	0.788	0.9136	0.8952	0.8524
TratioT	0.0051	0.0414	0.0536	0.0247	0.0223	0.0218	0.0472	0.0202	0.0226	0.027
BratioT	0.0012	0.0048	0.0065	0.0042	0.0039	0.0039	0.0089	0.0038	0.0045	0.0065
AratioT	0.0027	0.0163	0.0222	0.0138	0.0134	0.0083	0.0209	0.0107	0.0163	0.0195
GratioT	0.0324	0.1613	0.1162	0.1314	0.0883	0.1133	0.135	0.0517	0.0615	0.0947
C4										

DratioT	0.9437	0.8758	0.8532	0.8467	0.9079	0.681	0.8026	0.9539	0.9912	0.8275
TratioT	0.0116	0.0247	0.043	0.0328	0.0184	0.0625	0.0454	0.018	0.0035	0.0674
BratioT	0.0017	0.0047	0.0089	0.0053	0.0038	0.0133	0.01	0.003	6.53E-04	0.0111
AratioT	0.007	0.0142	0.016	0.0189	0.0091	0.0372	0.0241	0.0083	0.0014	0.0364
GratioT	0.036	0.0806	0.0788	0.0963	0.0608	0.2061	0.1179	0.0168	0.0032	0.0575
P3										
DratioT	0.9829	0.9547	0.8378	0.9533	0.9745	0.7988	0.7392	0.8423	0.8043	0.9824
TratioT	8.10E-04	0.0021	0.0142	0.002	0.0014	0.0067	0.014	0.0143	0.0199	0.0016
BratioT	3.14E-04	5.96E-04	0.0022	5.13E-04	4.75E-04	0.002	0.0059	0.0045	0.0054	5.22E-04
AratioT	4.52E-04	9.61E-04	0.0035	8.79E-04	6.39E-04	0.0038	0.0095	0.011	0.0122	7.98E-04
GratioT	0.0155	0.0416	0.1424	0.0433	0.023	0.1888	0.2315	0.1279	0.1582	0.0146
P4										
DratioT	0.9868	0.9647	0.9901	0.933	0.9593	0.5855	0.9551	0.9974	0.9319	0.9808
TratioT	0.0024	0.0045	0.0023	0.0097	0.0076	0.0596	0.0114	7.98E-04	0.0152	0.0053
BratioT	3.10E-04	0.0012	3.91E-04	0.0019	0.0012	0.0108	0.0018	1.84E-04	0.0046	0.0012
AratioT	0.0013	0.0031	9.11E-04	0.0063	0.0037	0.0302	0.0043	4.32E-04	0.0125	0.0037
GratioT	0.0093	0.0265	0.0063	0.0491	0.0282	0.3138	0.0274	0.0012	0.0357	0.009

Table 5.42 Power in different bands of participant Three next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1 st	4 th	5 th	14 th	6 th	11 th	8 th	4 th	5 th	28 th
DratioT	0.9538	0.9139	0.9871	0.9954	0.9835	0.9688	0.937	0.9966	0.9947	0.9782
TratioT	0.0155	0.0272	0.0051	0.0016	0.0059	0.0131	0.0253	0.0011	0.0015	0.0099
BratioT	0.0026	0.0054	7.74E-04	3.48E-04	0.0013	0.0023	0.0041	2.76E-04	3.73E-04	0.0018
AratioT	0.0083	0.0155	0.0022	8.99E-04	0.0034	0.0066	0.0108	5.49E-04	0.0014	0.0041
GratioT	0.0199	0.0381	0.0048	0.0018	0.0059	0.0092	0.0228	0.0015	0.002	0.006
Fz										
DratioT	0.9092	0.9362	0.9709	0.9455	0.9965	0.9499	0.9462	0.9927	0.9969	0.9928
TratioT	0.028	0.0287	0.0129	0.0266	0.0015	0.023	0.0239	0.0035	0.0012	0.0036

BratioT	0.0067	0.0045	0.0019	0.0046	3.55E-04	0.0043	0.0046	6.67E-04	2.90E-04	7.26E-04
AratioT	0.0232	0.0129	0.0063	0.0103	8.70E-04	0.0126	0.013	0.0015	9.08E-04	0.0017
GratioT	0.0329	0.0176	0.008	0.013	7.77E-04	0.0102	0.0123	0.0017	6.92E-04	0.0012
C3										
DratioT	0.8467	0.8644	0.9553	0.9892	0.9676	0.9813	0.9556	0.9943	0.9953	0.9512
TratioT	0.0231	0.0208	0.0068	0.0022	0.0079	0.0046	0.01	0.0013	0.001	0.0114
BratioT	0.0067	0.0052	0.002	5.07E-04	0.002	0.0011	0.0027	3.69E-04	3.33E-04	0.0044
AratioT	0.0178	0.0153	0.0051	0.0011	0.0047	0.0027	0.0061	6.85E-04	6.80E-04	0.0066
GratioT	0.1057	0.0942	0.0308	0.007	0.0178	0.0102	0.0256	0.0033	0.0027	0.0263
C4										
DratioT	0.9502	0.9741	0.9526	0.9953	0.9771	0.9449	0.9398	0.9935	0.9908	0.9311
TratioT	0.0153	0.009	0.0162	0.0018	0.0076	0.0226	0.0178	0.0022	0.0031	0.0267
BratioT	0.003	0.0016	0.0032	4.30E-04	0.0018	0.004	0.0062	6.58E-04	7.50E-04	0.0078
AratioT	0.0102	0.0049	0.01	9.81E-04	0.0051	0.0117	0.0142	0.0013	0.0024	0.0147
GratioT	0.0213	0.0104	0.018	0.0015	0.0084	0.0169	0.0219	0.0024	0.0029	0.0196
P3										
DratioT	0.972	0.9598	0.9822	0.9893	0.9901	0.9873	0.9786	0.996	0.9942	0.9896
TratioT	0.0033	0.0036	0.0016	9.54E-04	0.0023	0.0026	0.0037	6.54E-04	0.0014	0.0018
BratioT	7.14E-04	8.99E-04	3.96E-04	3.18E-04	2.57E-04	4.08E-04	6.00E-04	1.41E-04	1.73E-04	5.79E-04
AratioT	0.0017	0.0027	7.44E-04	6.29E-04	6.66E-04	0.0011	0.0014	2.47E-04	4.50E-04	0.001
GratioT	0.0222	0.033	0.0151	0.0088	0.0067	0.0086	0.0156	0.0029	0.0038	0.007
P4										
DratioT	0.9916	0.9846	0.9804	0.9897	0.9745	0.9684	0.951	0.9954	0.9948	0.9708
TratioT	0.0019	0.0041	0.0055	0.0024	0.0098	0.014	0.0153	0.0012	0.0025	0.0085
BratioT	5.65E-04	9.62E-04	0.001	6.98E-04	0.0019	0.0017	0.0039	3.47E-04	2.43E-04	0.0032
AratioT	0.0013	0.0028	0.0045	0.0017	0.0043	0.0059	0.0089	8.33E-04	7.89E-04	0.0063
GratioT	0.0046	0.0076	0.0085	0.0055	0.0096	0.01	0.0209	0.0022	0.0016	0.0112

Table 5.43 Power in different bands of participant Three 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	6TH	14TH	18TH	21ST	17TH	19TH	3RD	3rd	7th	20th
DratioT	0.9497	0.906	0.8743	0.9649	0.85	0.8743	0.9588	0.9745	0.9633	0.9833
TratioT	0.009	0.026	0.0335	0.0092	0.0421	0.0335	0.0076	0.0083	0.0117	0.0057
BratioT	0.0019	0.0035	0.0062	0.0015	0.0046	0.0062	0.0014	0.0014	0.0029	9.36E-04
AratioT	0.0053	0.0118	0.0139	0.005	0.0154	0.0139	0.0039	0.0052	0.0077	0.0024
GratioT	0.0341	0.0527	0.0721	0.0194	0.0879	0.0721	0.0283	0.0105	0.0144	0.0077
Fz										
DratioT	0.9858	0.855	0.8668	0.9073	0.9632	0.8668	0.9691	0.967	0.891	0.9069
TratioT	0.0034	0.0526	0.0481	0.0316	0.0135	0.0481	0.0093	0.0145	0.0458	0.0394
BratioT	7.36E-04	0.0068	0.0083	0.0046	0.0014	0.0083	0.0014	0.0021	0.0098	0.0067
AratioT	0.0027	0.0248	0.0215	0.0189	0.0048	0.0215	0.005	0.0073	0.0251	0.019
GratioT	0.0073	0.0607	0.0553	0.0377	0.017	0.0553	0.0152	0.0092	0.0284	0.028
C3										
DratioT	0.9487	0.7798	0.8788	0.6896	0.868	0.8788	0.8701	0.9216	0.9628	0.961
TratioT	0.0061	0.0504	0.03	0.0736	0.0309	0.03	0.0174	0.013	0.0076	0.0061
BratioT	0.0019	0.0076	0.0042	0.0107	0.0029	0.0042	0.0036	0.0035	0.0018	0.0017
AratioT	0.0052	0.0205	0.0114	0.0335	0.0125	0.0114	0.0114	0.009	0.0049	0.0037
GratioT	0.0382	0.1417	0.0756	0.1927	0.0857	0.0756	0.0975	0.0529	0.0229	0.0275
C4										
DratioT	0.9703	0.8599	0.9047	0.8829	0.7885	0.9047	0.9435	0.9802	0.9918	0.9559
TratioT	0.0052	0.0364	0.0273	0.0324	0.0499	0.0273	0.0106	0.008	0.0026	0.0145
BratioT	0.0013	0.0058	0.0045	0.0052	0.0088	0.0045	0.0023	0.0011	7.07E-04	0.0032
AratioT	0.0039	0.0208	0.013	0.0186	0.0217	0.013	0.007	0.0038	0.0014	0.0073
GratioT	0.0192	0.0771	0.0506	0.0608	0.1311	0.0506	0.0365	0.0069	0.0034	0.0192
P3										
DratioT	0.9819	0.9731	0.882	0.8829	0.9142	0.882	0.9652	0.9945	0.9926	0.9775
TratioT	8.91E-04	0.0015	0.0072	0.0324	0.0044	0.0072	0.0016	4.62E-04	6.16E-04	0.002

BratioT	3.23E-04	6.00E-04	0.0024	0.0052	0.0011	0.0024	3.27E-04	1.23E-04	1.85E-04	4.52E-04
AratioT	4.84E-04	6.19E-04	0.0032	0.0186	0.0023	0.0032	8.65E-04	3.27E-04	4.54E-04	8.86E-04
GratioT	0.0164	0.0242	0.1052	0.0608	0.0781	0.1052	0.032	0.0046	0.0062	0.0192
P4										
DratioT	0.9829	0.8989	0.9818	0.8365	0.9672	0.9818	0.9844	0.9876	0.9958	0.9856
TratioT	0.0029	0.0179	0.0038	0.039	0.0069	0.0038	0.0022	0.0033	8.57E-04	0.0035
BratioT	5.02E-04	0.0034	7.12E-04	0.0062	0.0011	7.12E-04	4.71E-04	6.82E-04	2.52E-04	7.21E-04
AratioT	0.0014	0.0117	0.0027	0.0169	0.003	0.0027	0.0016	0.0024	8.30E-04	0.0024
GratioT	0.0123	0.0681	0.011	0.1014	0.0219	0.011	0.0113	0.006	0.0023	0.0078

Table 5.44 Power in different bands of participant Three for low Arousal next 10 events

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	9 th	10 th	13 th	16 th	1 st	3 rd	10 th	7 th	14 th	16 th
DratioT	0.939	0.9778	0.9573	0.9703	0.9656	0.9859	0.973	0.9983	0.9226	0.8938
TratioT	0.0226	0.0076	0.0146	0.0109	0.0132	0.0051	0.0108	6.58E-04	0.0322	0.0467
BratioT	0.0034	0.0013	0.0027	0.0018	0.003	0.001	0.0016	1.27E-04	0.0056	0.0077
AratioT	0.0118	0.0045	0.0074	0.0051	0.0045	0.0026	0.0055	3.10E-04	0.0161	0.0199
GratioT	0.0231	0.0088	0.018	0.0119	0.0137	0.0054	0.009	6.21E-04	0.0235	0.0319
Fz										
DratioT	0.9482	0.9507	0.9243	0.752	0.9772	0.9827	0.96	0.9971	0.9383	0.9726
TratioT	0.0252	0.0209	0.0317	0.1141	0.0109	0.0073	0.0176	0.0012	0.0281	0.014
BratioT	0.0028	0.0036	0.0059	0.0167	0.0022	0.0016	0.0038	2.66E-04	0.0063	0.0028
AratioT	0.0118	0.0112	0.0162	0.055	0.0041	0.0042	0.0086	6.88E-04	0.0148	0.0055
GratioT	0.0119	0.0136	0.022	0.0621	0.0055	0.0042	0.01	6.93E-04	0.0124	0.0051
C3										
DratioT	0.9677	0.9844	0.9643	0.974	0.898	0.9844	0.9743	0.9983	0.9121	0.9419
TratioT	0.0099	0.0033	0.0066	0.005	0.0205	0.0033	0.0052	4.13E-04	0.0191	0.0154
BratioT	0.0013	6.62E-04	0.0014	0.0012	0.0068	8.85E-04	0.0017	1.17E-04	0.0061	0.0036
AratioT	0.0039	0.0022	0.0046	0.0031	0.0135	0.0023	0.003	2.11E-	0.012	0.0066

								04		
GratioT	0.0172	0.0094	0.0231	0.0167	0.0611	0.0091	0.0158	9.61E-04	0.0507	0.0325
C4										
DratioT	0.9808	0.9956	0.945	0.6885	0.9252	0.9817	0.9859	0.9988	0.8731	0.9338
TratioT	0.0061	0.0014	0.019	0.1104	0.0254	0.0069	0.0059	4.69E-04	0.042	0.0243
BratioT	0.0014	2.83E-04	0.004	0.0213	0.0092	0.0014	0.001	1.06E-04	0.0112	0.0054
AratioT	0.0047	0.001	0.0112	0.0675	0.0131	0.0028	0.0028	2.43E-04	0.0303	0.0146
GratioT	0.0069	0.0017	0.0207	0.1122	0.027	0.0073	0.0043	4.16E-04	0.0435	0.0218
P3										
DratioT	0.9696	0.9908	0.9566	0.9807	0.9359	0.9858	0.9897	0.9986	0.9917	0.9554
TratioT	0.0025	9.26E-04	0.0041	0.0018	0.0105	0.0025	0.0016	1.80E-04	0.0013	0.0066
BratioT	0.001	2.13E-04	0.0012	6.08E-04	0.0024	5.14E-04	3.27E-04	4.84E-05	2.49E-04	0.0017
AratioT	0.0024	6.00E-04	0.0025	0.0014	0.0037	9.66E-04	6.45E-04	9.33E-05	7.86E-04	0.0037
GratioT	0.0245	0.0075	0.0357	0.0155	0.0475	0.0102	0.0077	0.001	0.006	0.0326
P4										
DratioT	0.9926	0.9687	0.9751	0.9595	0.9743	0.9831	0.9764	0.9982	0.9415	0.9017
TratioT	0.0016	0.0088	0.006	0.0103	0.0062	0.0059	0.0089	5.78E-04	0.0232	0.0366
BratioT	4.59E-04	0.0019	0.0015	0.0026	0.0019	0.0011	0.0014	1.33E-04	0.0036	0.0057
AratioT	0.0013	0.0056	0.0048	0.0063	0.0047	0.003	0.0051	3.83E-04	0.0119	0.0222
GratioT	0.004	0.015	0.0127	0.0213	0.0129	0.0069	0.0082	7.02E-04	0.0198	0.0339

Table 5.45 Power in different bands of participant Four 1st 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	2 ND	10 TH	20 TH	4 TH	9 TH	5 TH	23 RD	6 th	8 th	19 th
DratioT	0.9996	0.9989	0.9945	0.9984	0.9945	0.998	0.9978	0.9327	0.998	0.9936
TratioT	1.66E-04	7.45E-04	0.0025	8.89E-04	0.0032	0.001	0.0011	0.0293	9.36E-04	0.0036
BratioT	3.39E-05	6.72E-05	5.05E-04	1.33E-04	4.19E-04	1.44E-04	2.44E-04	0.0039	1.35E-04	3.98E-04
AratioT	1.68E-04	2.61E-04	0.002	5.00E-04	0.0017	7.68E-04	7.87E-04	0.0296	7.68E-04	0.0019

GratioT	1.71E-05	3.41E-05	4.57E-04	8.12E-05	2.21E-04	1.12E-04	1.28E-04	0.0045	1.23E-04	4.33E-04
Fz										
DratioT	0.9994	0.9971	0.9988	0.9968	0.9747	0.9894	0.9987	0.9947	0.9973	0.9922
TratioT	2.87E-04	0.002	5.35E-04	0.0016	0.0167	0.0054	6.84E-04	0.0027	0.0015	0.0045
BratioT	2.56E-05	9.74E-05	9.60E-05	2.14E-04	0.0012	5.67E-04	6.64E-05	2.54E-04	1.39E-04	4.30E-04
AratioT	2.18E-04	7.44E-04	4.56E-04	0.0012	0.0066	0.0042	4.44E-04	0.0021	9.90E-04	0.0024
GratioT	2.07E-05	6.20E-05	8.70E-05	1.77E-04	8.16E-04	4.70E-04	5.89E-05	2.93E-04	1.45E-04	3.96E-04
C3										
DratioT	0.9992	0.9944	0.9961	0.9961	0.9672	0.9992	0.9949	0.9978	0.9972	0.9733
TratioT	3.81E-04	0.0036	0.0019	0.0019	0.0195	3.00E-04	0.003	0.0012	0.0013	0.0143
BratioT	6.82E-05	2.84E-04	2.88E-04	2.88E-04	0.0023	5.41E-05	3.28E-04	1.33E-04	1.64E-04	0.0017
AratioT	3.08E-04	0.0015	0.0014	0.0014	0.0089	3.82E-04	0.0016	7.42E-04	0.0012	0.0096
GratioT	8.30E-05	2.80E-04	3.76E-04	3.76E-04	0.0021	6.22E-05	2.69E-04	1.14E-04	1.36E-04	0.0012
C4										
DratioT	0.9672	0.9629	0.9949	0.9946	0.9708	0.9957	0.9969	0.9898	0.9078	0.9465
TratioT	0.016	0.0252	0.0018	0.0024	0.0168	0.0023	0.0015	0.0045	0.0465	0.03
BratioT	0.0018	0.0016	4.37E-04	4.24E-04	0.0016	2.96E-04	1.83E-04	6.68E-04	0.004	0.0022
AratioT	0.0141	0.0094	0.0025	0.0023	0.0097	0.0015	0.0013	0.0045	0.0395	0.0198
GratioT	9.12E-04	9.06E-04	3.21E-04	2.20E-04	9.70E-04	2.07E-04	1.44E-04	5.59E-04	0.0022	0.0015
P3										
DratioT	0.9996	0.9998	0.9987	0.9992	0.9975	0.9992	0.9977	0.9914	0.9993	0.9993
TratioT	1.94E-04	8.11E-05	5.34E-04	3.89E-04	0.0014	3.73E-04	0.0011	0.0031	2.90E-04	3.23E-04
BratioT	2.01E-05	5.98E-06	7.90E-05	4.29E-05	1.28E-04	5.62E-05	1.15E-04	5.53E-04	4.26E-05	3.34E-05
AratioT	9.08E-05	4.48E-05	3.62E-04	2.44E-04	5.61E-04	2.01E-04	6.59E-04	0.0027	2.07E-04	1.61E-04
GratioT	7.46E-05	2.24E-05	3.33E-04	1.52E-04	4.01E-04	2.04E-04	4.42E-04	0.0022	1.54E-04	1.34E-04
P4										
DratioT	0.8745	0.8278	0.8466	0.8069	0.5265	0.7738	0.4244	0.1858	0.917	0.8112
TratioT	0.0016	0.0018	0.0018	0.0026	0.0029	0.0019	0.0065	0.0094	0.0013	0.0012

BratioT	0.0016	0.0021	0.0021	0.0027	0.0015	0.0019	0.0042	0.0101	9.64E-04	3.07E-04
AratioT	0.0011	9.88E-04	7.10E-04	0.0014	0.0014	8.01E-04	0.0028	0.0039	4.38E-04	6.88E-04
GratioT	0.1212	0.1673	0.1487	0.1863	0.4677	0.2216	0.5621	0.7908	0.0803	0.1866

Table 5.46 Power in different bands of participant Four next 10 events for High Arousal

	HA	HA	HA	HA	HA	HA	HA	HA	HA	HA
Cz	1 st	4 th	5 th	14 th	6 th	11 th	8 th	4 th	5 th	28 th
DratioT	0.9818	0.9789	0.9864	0.9772	0.7915	0.9569	0.9178	0.9789	0.9526	0.9877
TratioT	0.009	5.49E-04	0.0078	0.0159	0.0074	0.0015	0.0049	5.49E-04	0.0023	0.0012
BratioT	9.25E-04	1.12E-04	5.65E-04	8.31E-04	0.0027	3.01E-04	0.001	1.12E-04	6.12E-04	1.98E-04
AratioT	0.0073	4.18E-04	0.0047	0.0054	0.004	0.0011	0.0026	4.18E-04	0.0013	7.09E-04
GratioT	9.57E-04	0.02	4.97E-04	5.77E-04	0.1944	0.0402	0.0736	0.02	0.0432	0.0102
Fz										
DratioT	0.9969	0.9986	0.9984	0.977	0.9683	0.9705	0.8114	0.9986	0.8021	0.9748
TratioT	0.0016	9.52E-05	9.90E-04	0.0151	0.0024	0.0025	0.0249	9.52E-05	0.0203	0.0054
BratioT	1.39E-04	1.38E-05	4.58E-05	6.38E-04	4.37E-04	2.77E-04	0.0027	1.38E-05	0.0031	4.60E-04
AratioT	0.0013	7.80E-05	5.02E-04	0.0068	0.0016	0.0016	0.0137	7.80E-05	0.0158	0.0037
GratioT	1.32E-04	0.0012	4.55E-05	3.88E-04	0.0274	0.0251	0.1472	0.0012	0.1586	0.0156
C3										
DratioT	0.9683	0.9939	0.9984	0.9883	0.5982	0.9623	0.8207	0.9939	0.604	0.9689
TratioT	0.0149	1.40E-04	0.001	0.0066	0.0115	9.53E-04	0.0161	1.40E-04	0.0187	0.005
BratioT	0.0018	3.40E-05	6.45E-05	4.40E-04	0.0052	2.55E-04	0.002	3.40E-05	0.0043	4.93E-04
AratioT	0.0132	9.69E-05	4.39E-04	0.0044	0.008	9.17E-04	0.0085	9.69E-05	0.0108	0.002
GratioT	0.0018	0.0059	5.00E-05	2.87E-04	0.3771	0.0356	0.1527	0.0059	0.3622	0.0237
C4										
DratioT	0.8984	0.9963	0.9908	0.9731	0.605	0.9869	0.8207	0.9963	0.921	0.9003
TratioT	0.0564	1.47E-04	0.0056	0.0191	0.0178	5.44E-04	0.0161	1.47E-04	0.0069	0.0371
BratioT	0.0038	2.16E-05	3.27E-04	8.54E-04	0.0056	9.53E-05	0.002	2.16E-05	0.0011	0.0019

AratioT	0.0386	1.23E-04	0.0031	0.0064	0.0128	4.75E-04	0.0085	1.23E-04	0.0037	0.0116
GratioT	0.0027	0.0034	1.84E-04	4.40E-04	0.3587	0.0119	0.1527	0.0034	0.0673	0.0491
P3										
DratioT	0.9981	0.6522	0.9978	0.9986	0.5723	0.9608	0.8732	0.6522	0.7987	0.9532
TratioT	8.48E-04	0.0049	0.0012	8.61E-04	0.0059	3.78E-04	0.0023	0.0049	0.0033	0.0015
BratioT	1.25E-04	0.0018	9.05E-05	5.27E-05	0.0052	2.71E-04	0.0011	0.0018	0.0021	5.24E-04
AratioT	4.98E-04	0.0027	5.28E-04	3.54E-04	0.0033	3.02E-04	0.001	0.0027	0.002	4.55E-04
GratioT	3.83E-04	0.3384	3.62E-04	1.80E-04	0.4133	0.0383	0.1223	0.3384	0.1939	0.0444
P4										
DratioT	0.7443	0.9821	0.6647	0.8708	0.9196	0.9073	0.9139	0.9821	0.9269	0.9838
TratioT	0.002	5.07E-04	0.0029	0.0017	0.0023	0.0021	0.004	5.07E-04	0.004	0.0029
BratioT	9.03E-04	1.07E-04	0.0016	4.93E-04	0.0011	6.68E-04	8.79E-04	1.07E-04	8.52E-04	2.03E-04
AratioT	0.0011	3.10E-04	0.0015	5.35E-04	0.0014	0.0018	0.0019	3.10E-04	0.0022	6.70E-04
GratioT	0.2517	0.017	0.3293	0.1265	0.0757	0.0881	0.0793	0.017	0.0661	0.0124

Table 5.47 Power in different bands of participant Four 1st 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Cz	6TH	14TH	18TH	21ST	17TH	19TH	3RD	3rd	7th	20th
DratioT	0.9952	0.9921	0.9863	0.9936	0.994	0.994	0.9969	0.9802	0.9779	0.97
TratioT	0.0025	0.004	0.0078	0.0037	0.0037	0.0032	0.0015	0.0092	0.011	0.0189
BratioT	2.93E-04	4.82E-04	7.26E-04	3.39E-04	2.93E-04	4.16E-04	1.91E-04	9.95E-04	0.0012	0.0013
AratioT	0.0018	0.0031	0.0046	0.0021	0.0018	0.002	0.0013	0.0088	0.0091	0.0087
GratioT	2.20E-04	3.96E-04	5.94E-04	2.60E-04	2.01E-04	3.38E-04	9.05E-05	7.70E-04	8.00E-04	0.0011
Fz										
DratioT	0.9977	0.9933	0.9962	0.9786	0.9939	0.9948	0.9946	0.9945	0.9783	0.9816
TratioT	0.0013	0.0037	0.0022	0.0127	0.0042	0.0033	0.0028	0.0026	0.012	0.0115
BratioT	9.87E-05	2.51E-04	1.25E-04	8.67E-04	1.73E-04	2.16E-04	2.50E-04	1.90E-04	7.61E-04	5.71E-04
AratioT	8.34E-04	0.0024	0.0013	0.0072	0.0015	0.0015	0.0022	0.0025	0.0083	0.0058

GratioT	8.28E-05	2.37E-04	1.11E-04	6.80E-04	1.55E-04	2.11E-04	1.52E-04	1.53E-04	6.35E-04	5.96E-04
C3										
DratioT	0.9946	0.9743	0.9944	0.9717	0.9862	0.9524	0.9922	0.8899	0.9962	0.9789
TratioT	0.0026	0.0137	0.003	0.0161	0.0079	0.0276	0.0037	0.0607	0.0021	0.0128
BratioT	3.27E-04	0.0015	2.81E-04	0.0013	6.42E-04	0.0027	6.17E-04	0.0046	1.95E-04	9.21E-04
AratioT	0.002	0.0087	0.002	0.0097	0.0046	0.0141	0.0029	0.0415	0.0013	0.0067
GratioT	3.83E-04	0.0019	3.13E-04	0.0013	6.96E-04	0.0031	5.60E-04	0.0033	1.24E-04	6.89E-04
C4										
DratioT	0.988	0.982	0.9434	0.978	0.9866	0.9809	0.9936	0.9331	0.9635	0.959
TratioT	0.0076	0.0096	0.0339	0.0128	0.0084	0.0099	0.0028	0.041	0.0202	0.0256
BratioT	6.18E-04	8.69E-04	0.0026	0.0012	5.39E-04	0.0012	4.34E-04	0.0026	0.0015	0.0016
AratioT	0.0034	0.0068	0.0181	0.0072	0.0041	0.0073	0.0029	0.0219	0.0142	0.013
GratioT	3.84E-04	7.17E-04	0.0021	7.88E-04	3.36E-04	7.89E-04	1.81E-04	0.0014	5.97E-04	8.59E-04
P3										
DratioT	0.9991	0.9985	0.9951	0.9974	0.9978	0.9993	0.9974	0.9981	0.9982	0.9983
TratioT	4.61E-04	8.56E-04	0.0028	0.0014	0.0011	3.50E-04	0.0014	0.001	0.001	8.97E-04
BratioT	4.01E-05	6.08E-05	1.96E-04	1.49E-04	8.31E-05	3.23E-05	1.44E-04	8.12E-05	8.26E-05	9.36E-05
AratioT	1.91E-04	3.47E-04	0.0011	5.66E-04	6.93E-04	1.86E-04	6.76E-04	5.14E-04	4.05E-04	4.03E-04
GratioT	1.98E-04	2.53E-04	8.64E-04	4.16E-04	3.22E-04	1.75E-04	4.47E-04	3.05E-04	2.86E-04	3.30E-04
P4										
DratioT	0.5977	0.7799	0.7144	0.4482	0.8246	0.8075	0.5977	0.4267	0.394	0.5411
TratioT	0.0034	0.0016	0.003	0.0065	0.0011	0.0016	0.0035	0.0059	0.0075	0.0066
BratioT	0.0036	2.63E-04	0.0043	0.0032	4.48E-04	8.35E-04	0.0016	0.0033	0.0041	0.0052
AratioT	0.0023	5.99E-04	0.0025	0.0027	4.81E-04	8.42E-04	0.0017	0.0028	0.0033	0.0026
GratioT	0.3931	0.2177	0.2759	0.5395	0.1733	0.1892	0.3954	0.5614	0.5911	0.4445

Table 5.48 Power in different bands of participant Four next 10 events for Low Arousal

	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
	9 th	10 th	13 th	16 th	1 st	3 rd	10 th	7 th	14 th	16 th
Cz										
DratioT	0.9622	0.9887	0.9885	0.9818	0.9709	0.8546	0.9384	0.9803	0.9949	0.7005
TratioT	0.0223	0.0077	0.0035	0.009	8.67E-04	0.007	0.0027	0.001	3.84E-04	0.0161
BratioT	0.0017	3.56E-04	7.98E-04	9.25E-04	5.07E-04	9.35E-04	9.37E-04	2.78E-04	6.53E-05	0.0033
AratioT	0.0124	0.0031	0.0064	0.0073	5.61E-04	0.0062	0.0027	8.97E-04	2.54E-04	0.0107
GratioT	0.0014	2.74E-04	9.03E-04	9.57E-04	0.0272	0.1312	0.0552	0.0176	0.0044	0.2693
Fz										
DratioT	0.9939	0.9936	0.9953	0.9969	0.9912	0.6238	0.8875	0.9897	0.9782	0.9366
TratioT	0.0037	0.0045	0.0019	0.0016	5.65E-04	0.0374	0.0118	0.0012	0.0036	0.0077
BratioT	2.10E-04	1.38E-04	2.58E-04	1.39E-04	1.74E-04	0.0043	0.002	1.74E-04	4.11E-04	8.12E-04
AratioT	0.002	0.0016	0.0023	0.0013	3.67E-04	0.0406	0.0132	0.0011	0.0027	0.0067
GratioT	1.84E-04	1.17E-04	2.82E-04	1.32E-04	0.0077	0.2938	0.0855	0.0078	0.0151	0.0481
C3										
DratioT	0.9888	0.9955	0.9691	0.9683	0.9715	0.9288	0.9023	0.99	0.9602	0.9324
TratioT	0.0056	0.0027	0.0144	0.0149	8.09E-04	0.0025	0.0037	3.42E-04	0.0027	0.0048
BratioT	5.34E-04	1.44E-04	0.0021	0.0018	4.00E-04	3.31E-04	9.19E-04	1.23E-04	3.52E-04	7.56E-04
AratioT	0.0047	0.0015	0.0119	0.0132	4.56E-04	0.0025	0.0031	3.37E-04	0.0019	0.003
GratioT	3.72E-04	1.03E-04	0.0026	0.0018	0.0268	0.0659	0.09	0.0092	0.0348	0.059
C4										
DratioT	0.9811	0.9821	0.9797	0.8984	0.9922	0.9036	0.9725	0.981	0.8349	0.9611
TratioT	0.0108	0.0123	0.0065	0.0564	2.97E-04	0.0066	0.0018	0.0013	0.0227	0.0051
BratioT	7.22E-04	5.50E-04	0.0024	0.0038	1.38E-04	7.95E-04	4.41E-04	2.94E-04	0.0024	5.12E-04
AratioT	0.007	0.0048	0.0075	0.0386	2.13E-04	0.0062	0.002	0.0011	0.0127	0.0026
GratioT	3.87E-04	2.76E-04	0.0039	0.0027	0.0072	0.0828	0.0232	0.0162	0.1273	0.0307
P3										

DratioT	0.9994	0.9966	0.9996	0.9981	0.9072	0.8972	0.7148	0.9479	0.9695	0.4877
TratioT	2.51E-04	0.0019	1.73E-04	8.48E-04	0.0015	0.0016	0.0046	8.77E-04	7.64E-04	0.0091
BratioT	4.04E-05	1.30E-04	3.39E-05	1.25E-04	0.0011	2.29E-04	0.0021	6.09E-04	1.82E-04	0.0051
AratioT	2.13E-04	9.17E-04	1.22E-04	4.98E-04	6.62E-04	6.90E-04	0.0023	4.61E-04	3.26E-04	0.0047
GratioT	1.33E-04	4.34E-04	1.16E-04	3.83E-04	0.0896	0.1003	0.2763	0.0502	0.0292	0.4933
P4										
DratioT	0.573	0.5853	0.8317	0.7443	0.8795	0.966	0.9297	0.9633	0.8526	0.9912
TratioT	0.0056	0.0042	0.0013	0.002	0.0038	0.0011	0.0029	0.0018	0.0108	6.29E-04
BratioT	0.0058	0.0017	7.40E-04	9.03E-04	0.0019	1.84E-04	7.18E-04	5.09E-04	0.0012	1.06E-04
AratioT	0.0029	0.0028	0.001	0.0011	0.0023	9.19E-04	0.0017	7.05E-04	0.005	2.06E-04
GratioT	0.4127	0.406	0.1652	0.2517	0.1126	0.0319	0.065	0.0337	0.1303	0.0079

5.2. Test 2: CLASSIFICATION

In first phase classification is performed by considering entropy of all five subbands of EEG signal using with single electrode for each the results are shown in Table 5.49.

Table 5.49 Accuracy of classification by entropy

Electrode	% Accuracy				
	Part1	Part2	Part3	Part4	Average
Cz	85%	75%	65%	72.5%	74.3%
Fz	53%	67.5%	62.5%	80%	65.75%
C3	55%	72.5%	67.5%	62.5%	64.37%
C4	70%	60%	50%	70%	62.5%
P3	60%	60%	52.5%	62.5%	58.75%
P4	62.5%	60%	62.5%	80%	66.25%

The results of Table 5.49 are shown as Bar graph in figure 5.1.

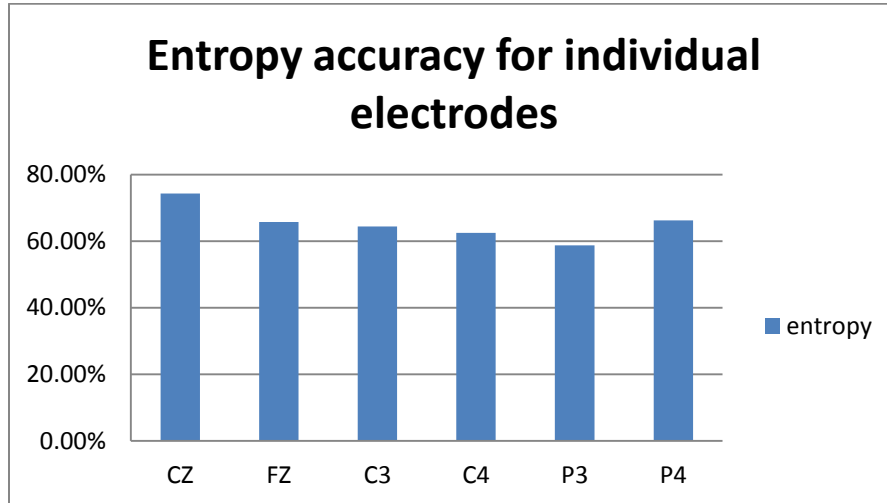


Figure 5.1 Accuracy of classification through entropy

This Classification is then repeated by taking variance as the input feature. The results are shown in tabular form in Table 5.50 and in Bar graph representation in Figure 5.2.

Table 5.50 Accuracy of classification by variance

Electrode	% Accuracy				
	Part1	Part2	Part3	Part4	Average
Cz	67.5%	70%	55%	60%	63.12%
Fz	60%	62.5%	50%	52.5%	56.25%
C3	77.5%	67%	62.5%	67.5%	68.6%
C4	60%	66%	55%	55%	59%
P3	82.5%	70%	60%	67.5%	70%
P4	50%	66.5%	55%	66.5%	59.5%

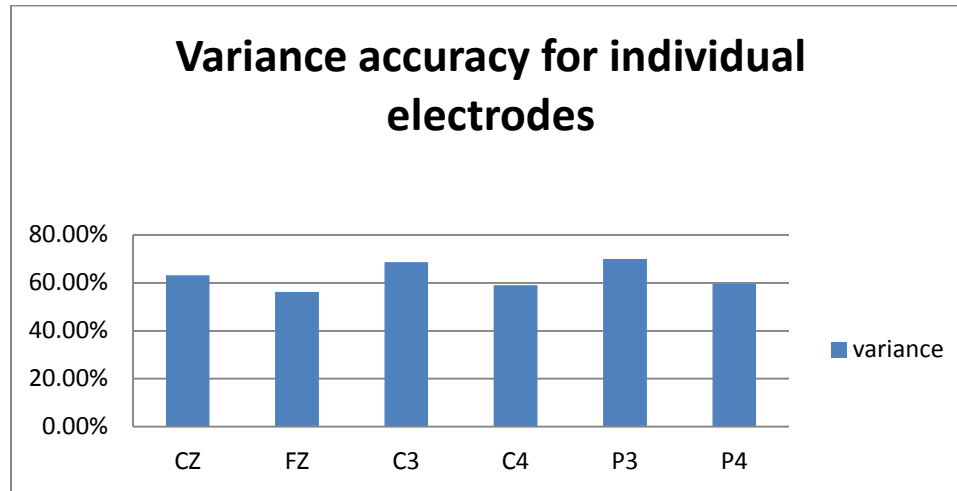


Figure 5.2 Accuracy of classification through variance

Next classification is performed by considering power of all five subbands of EEG signal using with single electrode for each the results are shown in tabular form in Table 5.51 And shown in Bar graph form in Figure 5.3.

Table 5.51 Accuracy of classification by Power

Electrode	% Accuracy				
	Part1	Part2	Part3	Part4	Average
Cz	70%	62.5%	50%	55%	59.3%
Fz	67.5%	60%	52.5%	52.5%	58.6%
C3	70%	55%	67.5%	57.5%	62.5%
C4	50%	65%	50%	57.5%	55.6%
P3	60%	67.5%	55%	72.5%	63.75%
P4	67.5%	57.5%	60%	70%	63.75%

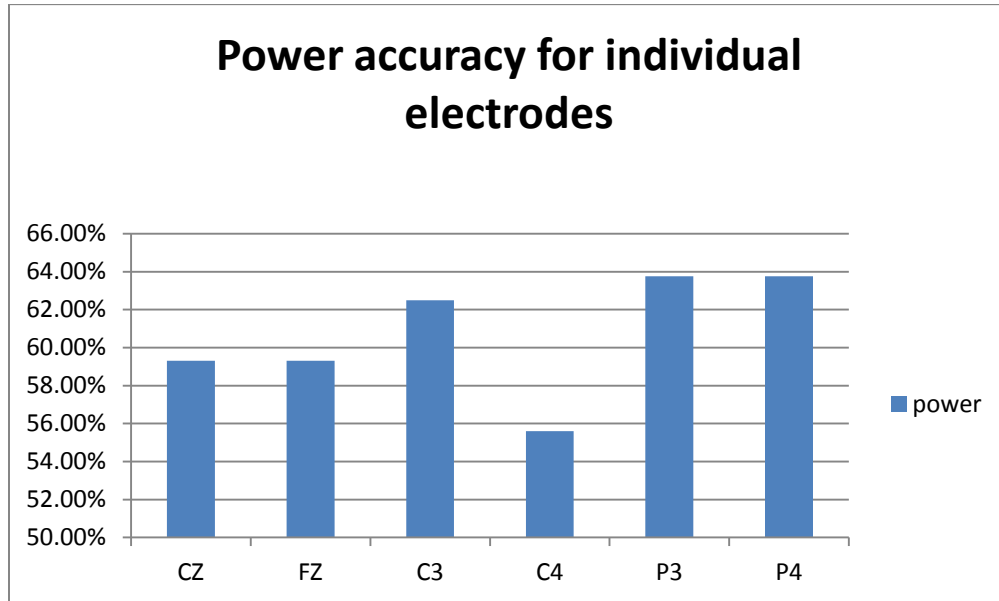


Figure 5.3 Accuracy of classification through power

In second phase classification is performed through all electrode data and the results show that entropy is the main feature to detect changes in arousal states. Accuracy through entropy is 79.17% which is higher than other two features. Shown in Table 5.52.

Table 5.52 Accuracy of classification

	% Accuracy				
	Participant1	Participant2	Participant3	Participant4	Average
Entropy	77.5%	80%	80%	79.2%	79.17%
Variance	77.5%	85%	70%	80%	78.12%
Power	62.5%	87.5%	70%	65%	71.25%.

A comparison of all the experiments is given in Table 5.53. And in Bar graph form in Figure 5.4

Table 5.53 Comprehensive results

Electrodes	Entropy	Variance	Power
Cz	74.3%	63.12%	59.30%
Fz	65.75%	56.25%	59.30%
C3	64.50%	68.60%	62.50%
C4	62.50%	59%	55.6%
P3	58.75%	70%	63.75%
P4	66.25%	59.50%	63.75%
All Electrodes	79.17%	78.12%	71.25%

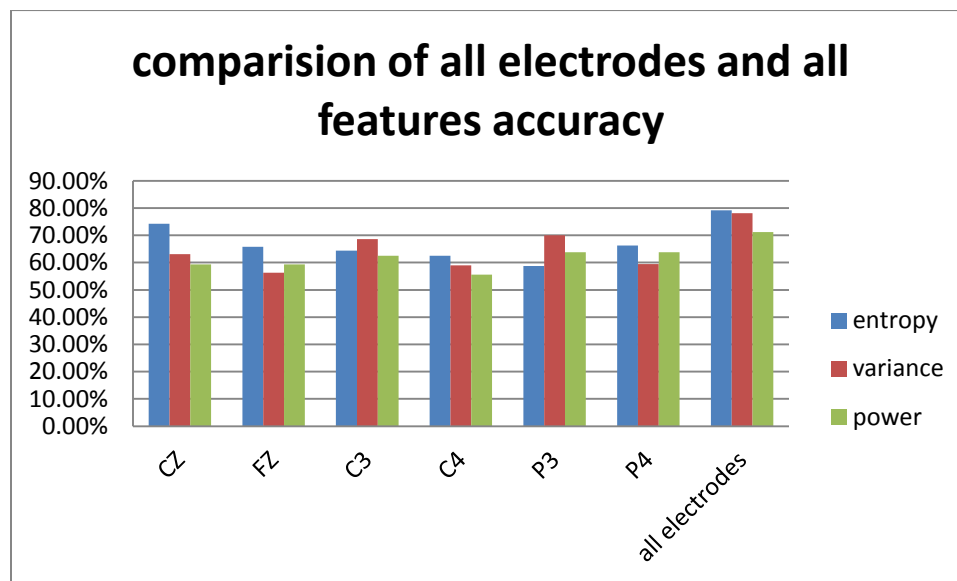


Figure 5.4 Comprehensive results.

6.1. Conclusion

1. Of all the three features under consideration i.e. entropy, variance and power, classification of emotion for arousal is best obtained with entropy of all the subbands i.e. Delta, Theta, Alpha, Beta and Gamma.
2. Though the best classification is obtained by using EEG signals from all six electrodes i.e. CZ, Fz, C3, C4, P3 and P4 to minimize the computational time, a reasonably good accuracy is obtained by taking entropy feature of central midline electrode (CZ) alone.
3. A central midline portion of the brain is possibly more involved in arousal.

5.3. Future scope

The classifier designed only two states of emotion, namely Low arousal and High arousal. Other dimensions of emotion like violence and dominance may be added to design a multiclass classifier.

REFERENCES

- [1] B.W. Jervis, E.C. Ifeachor, and E.M. Allen, "The removal of ocular artefacts from the electroencephalogram: a review" *Medical & biological engineering & computing*, Vol. 26, Issue 1, pp. 2-12, January 1988.
- [2] M. Singh, "Introduction to Biomedical Instrumentation", *PHI learning*, 2010
- [3] L. Tawade and H. Warpe, "Detection of Epilepsy Disorder Using Discrete Wavelet Transforms Using MATLABs", *International Journal of Advanced Science and Technology*, Vol. 28, pp. 17-24, 2011.
- [4] G.C DeCrozet, "Emotion assessment for affective computing based on brain and peripheral signal" *THESIS présentée à la faculté des sciences de l'Université de Genève pour obtenir le grade de Docteur ès sciences, mention informatique par*, France.
- [5] H. Bung and S. Furui, "Automatic Recognition and understanding of spoken languages- a first step toward natural human machine communication", *Proceedings of IEEE*, vol. 88, issue 8, pp.1142- 1165, Doi [10.1109/5.880077](https://doi.org/10.1109/5.880077), Aug. 2000.
- [6] R.Cowie, E.Douglas, N.Tsapatsoulis, Votsis G., Kollias G., Fellenz W. and Taylor J.G., "Emotion Recognition in human computer interaction", *Transactions IEEE Signal Processing*, Vol. 18, Issue 1, pp.32-80, Doi [10.1109/79.911197](https://doi.org/10.1109/79.911197), Jan 2001.
- [7] R. Plutchik, "The Emotions: Facts, Theories and a New Model", Random House., *New York*, 1962.
- [8] P.Ekman. T. Dalgleish and M. Power, "Basic emotions. in Handbook of cognition and emotion", *John Wiley & Sons, Ltd*, pages 45-60, Sussex, U.K., 1999.
- [9] R. Horlings, "Emotion recognition using brain activity", *Man-Machine Interaction Group TU Delft*, 27 March, 2008.
- [10] L.I. Aftanas., N.V.Reva, A.A.Varlamov, S.V.Pavlov S.V. and V.P. Makhnev, "Analysis of evoked EEG synchronization and desynchronization in conditions of emotional activation in humans: Temporal and topographic characteristics", *Springer, Neuroscience and Behavioral Physiology*, Vol. 34, No. 8, pp. 859-867, 2004.
- [11] Christos A. Frantzidis, Charalampos Bratsas, *Member, IEEE*, Christos L. Papadelis, Evdokimos Konstantinidis, Costas Pappas, and Panagiotis D. Bamidis "Toward Emotion Aware Computing: An Integrated Approach Using Multichannel Neurophysiological Recordings and Affective Visual Stimuli". *IEEE TRANSACTIONS ON INFORMATION TECHNOLOGY IN BIOMEDICINE*, VOL. 14, NO. 3, pp. 589-587, MAY 2010

- [12] G. Bush, P. Luu, and M.I. Posner, "Cognitive and emotional influences in anterior cingulate cortex", *Trends in cognitive sciences*, pp. 215-222, 2000.
- [13] O.H. Mowrer, "Learning Theory and Behavior", Wiley, New York, 1960.
- [14] Gaulin SJC & H Mcburney, "Evolutionary developmental psychopathology", *Evolutionary psychology*, Prentice Hall, pp. 121-142, 2003.
- [15] A. Choppin, "EEG-based human interface for disabled individuals: Emotion expression with neural networks", *Master's thesis, Tokyo Institute of Technology*, 2000.
- [16] T.Musha, Y.Terasaki, H.A. Haque, and G.A. Ivanitsky, "Feature extraction from EEGs associated with emotions", Springer, Research and Development in Intelligent Systems, Proceedings of AI-2007 The 27th SGAI International Conference on Innovative Techniques and Application of Artificial Intelligent, 2007.
- [17] G.Chanel, J. Kon, D. Grandjean, and T.Pun, "Emotion assessment: Arousal evaluation using EEG's and peripheral physiological signals", *Technical Report, Computer Vision Group, Computing Science Center, Geneva, Dec., 2005*.
- [18] K.H. Kim, S.W. Bang, and S.R. Kim "Emotion recognition system using short term monitoring of physiological signals". *Springer Medical and Biological Engineering and Computing*, Vol. 42, Issue 3, pp.419-427, 2004.
- [19] A. Haag, S. Goronzy, P. Schaich, and J. Williams "Emotion recognition using biosensors: First steps towards an automatic system", *Lecture Notes in Computer Science*, Vol. 3068, pp 36-48, 2004.
- [20] J. Russell, "A circumplex model of affect", *Journal of personality and social psychology*, Vol. 39, Issue 6, pp. 1161-1178, 1980.
- [21] A. Savran, K. Ciftci, G. Chanel, J.C. Mota, L.H. Viet, B. Sankur, L. Akarun, A. Caplier and M. Rombaut, "Emotion detection in the loop from brain signals and facial images", available at <http://www.enterface.net/results/>, 2006.
- [22] A.Delorme and S.Makeig, "EEGLab: An open source toolbox for analysis of single-trial EEG dynamics including independent component analysis" *Journal of neuroscience methods* 134, Swartz Center for Computational Neuroscience, Institute for Neural Computation, University of California San Diego, pp. 9-21, 2003.
- [23] M. Singh, S.Kaur, "Frequency Band separation for Epilepsy detection using EEG", *International Journal of Information Technology & Knowledge Management*, Vol 6, No. 1, pp. 11-13, December 2012.

[24] Michael Negnevitsky, "Artificial Intelligence: A Guide To Intelligent Systems"
Harlow, England: Pearson Education, 2nd ed., 2005

[25] M. Anand Rao, J. S., "Neural Network: Algorithms and Applications", Alpha Science International, ISBN :1842651315, 2003.

[26] V. Arulmozhi "Classification task by using Matlab Neural Network Tool Box – A Beginner's View", *International Journal of Wisdom Based Computing*, Vol. 1 (2), pp. 59-60, August 2011.

PUBLICATIONS FROM THIS RESEARCH

1. Mandeep Singh, Mooninder Singh and Surabhi Gangwar “Emotion Detection Using Electroencephalography (EEG):A Review” , *International Journal of Information Technology & Knowledge Management*. Vol.7 no.1 Dec.2013 [in press].
2. Mandeep Singh, Mooninder Singh and Surabhi Gangwar, “Feature Extraction from EEG for Emotion Classification, *International Journal of Information Technology & Knowledge Management*. Vol.7 no.1 Dec.2013[in press]
3. Mandeep Singh, Mooninder Singh and Surabhi Gangwar “Arousal Detection Using EEG Signal”, *International Journal of Information Technology & Knowledge Management*. Vol.7 no.1 Dec.2013 [in press].