2019　Graduation Thesis

Determination of Movie Preferences by Analyzing Biosignals

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# Chapter 1 Introduction

## Background and Objective

In recent years, streaming platforms such as Netflix or Hulu have become increasingly prevalent. As the web content for movie streaming continues to grow, it is also simultaneously becoming harder to choose a movie to watch from such a wide selection. In order to improve user experience, many streaming services recommend content by using algorithms based on user history [1]. However, this may not account for a user’s current mood or preferences. To create more accurate recommendations, using biosignals as a means is a viable solution. By using a user’s biosignals, it is possible to recommend content based on a user’s preferences. As trailers are a good indication of whether the user will want to watch the movie or perhaps like it, they are used in the experiment to determine the most valuable biosignals in considering preferences. This paper explores the possibility of using biosignals to determine a user’s preferences by analyzing their reactions to various movie trailers.

1. Structure of Thesis

The paper is composed of 6 chapters.

Chapter 1 gives an overview of the paper.

In Chapter 2, the research papers referred to and the information required to gain a better understanding of the results are mentioned. Three research papers are introduced.

Chapter 3 goes over the experimental process.

Chapter 4 describes how the collected data was processed to create a dataset.

Chapter 5 mentions how the data from Chapter 4 was put into machine learning and also presents the results.

Chapter 6 summarizes the project and lists potential future steps.

# Chapter 2 Previous Research

## Brainwaves

Brainwaves are an illustration of the electrical activity in the brain. They vary based on stimulation or psychological state. There are various types of brainwaves and determine different states such as relaxation or excitation depending on the part of the brain they are measured from.

This project will focus on two of these different types: α waves and β waves. α waves are between 8 to 12 Hz and represent relaxation or a calmer state of mind. β waves range from 13 to 38 Hz and are associated with a more active state; they are most active when one is excited or focusing on their surroundings or an object.

The brain is composed of the frontal, parietal, temporal and occipital lobe. The frontal lobe is associated with emotions, problem solving, judgement and etc. The temporal lobe is also associated with emotion but deals with sensory input and comprehension as well. The parietal lobe deals with the integration of sensory input. And finally, the occipital lobe deals with visual processing. [2]

## RRI

RRI, or the R-R Interval, is the measure of the time interval between heart beats. In an electrocardiogram, it is length between the one QRS to another QRS complex [2]. Not only can it vary with physical activity and nervous system activity, it also varies with one’s emotions. RRI increases as the parasympathetic nervous system becomes more active and decreases as the sympathetic nervous system has increased activity [3].

## Pupil Size

Pupils dilate and constrict depending on the brightness around them. They are also known to change their size when one shows interest towards an object. In addition, they dilate when one is aroused or excited. In contrast, they constrict when one is exposed to something unpreferable [4].

## Classification of Listener’s Music Preference Using Biosignals by Variational Autoencoder

Tabata conducted a similar experiment measuring brainwaves, RRI, and pupil size regarding a user’s musical preferences. She concluded that it is possible to determine a user’s preferences from using biosignals. Analysis from the Variational Autoencoder had a 67.1% inclination in the plot [5].

## Biosignal Controlled Recommendation in Entertainment Systems

Liu observed a “long tail” distribution in a user’s watching history, indicating that other than a few frequently played videos, only few are re-watched. User history may not be valid in determining a user’s preferences. He conducted an experiment with an entertainment system using biosignal controlled recommendation. A user’s subjective stress scale and objective stress level can both be significantly reduced by controlling a passenger’s heart rate with specific tempo music [6].

# Chapter 3 Experiment Setup

## Subjects

7 males and 5 females with the average of 21.83 age and S.D. of 1.14 participated the experiment.

## Equipment

Pupil size is measured using Tobii X60 (60[Hz] sampling), brainwaves are measured using Emotiv EPOC+ 14 Channel Mobile EEG (AF3, F7, F3, FC5, T7, P7, O1, O2, P8, T8, FC6, F4, F8, AF4, 128[Hz] sampling), and RRI (R-R Interval) is collected by Polar Sportswatch V800. Video contents are presented on Nanao FS2332 LCD monitor.

## Movie Trailers

5 main genres (Action, Comedy, Horror, Romance, Sci-fi/Fantasy) are tested in the experiment. The list of trailers and their genres are shown in Table 3.3.1: List of Movie Trailers. The genres are determined by IMDb; each movie can have up to 3 genres. The main genre category the movie is included in is bolded. Each subject watches 2 trailers from each main genre (total of 10 trailers) in random order. Each trailer is over 2 minutes.

Table 3.3.1: List of Movie Trailers

|  |  |  |  |
| --- | --- | --- | --- |
| Movie | Genre 1 | Genre 2 | Genre 3 |
| Brightburn | Drama | **Horror** | Mystery |
| The Conjuring | **Horror** | Mystery | Thriller |
| The Bye Bye Man | Drama | Fantasy | **Horror** |
| The New Mutants | Action | **Horror** | Sci-fi |
| American Ultra | **Action** | Comedy | Sci-fi |
| Elysium | **Action** | Drama | Sci-fi |
| Terminator Dark Fate | **Action** | Adventure | Sci-fi |
| Mission Impossible: Rogue Nation | **Action** | Adventure | Thriller |
| Love Rosie | Comedy | **Romance** |  |
| Me Before You | Drama | **Romance** |  |
| The Best of Me | Drama | **Romance** |  |
| Never Let Me Go | Drama | **Romance** | Sci-fi |
| The Devil Wears Prada | **Comedy** | Drama |  |
| The Edge of Seventeen | **Comedy** | Drama |  |
| 13 Going On 30 | **Comedy** | Fantasy | Romance |
| 17 Again | **Comedy** | Drama | Fantasy |
| Interstellar | Adventure | Drama | **Sci-fi** |
| Aquaman | Action | Adventure | **Fantasy** |
| Maleficent | Action | Adventure | **Fantasy** |
| Jurassic World: Fallen Kingdom | Action | Adventure | **Fantasy** |

## Questionnaire

A questionnaire is given before watching the trailers and after watching each trailer. The questionnaire given at the beginning assesses the subject’s three favorite, least favorite genres, and how emotional he or she gets during a movie from a 1 to 5 scale. Additional questionnaires are given after each trailer. Each sheet has a table as shown in Table 3.4.1 with 11 items for a user to rate from a scale of 1 to 5.

Table 3.4.1: Questionnaire used to evaluate movie trailer



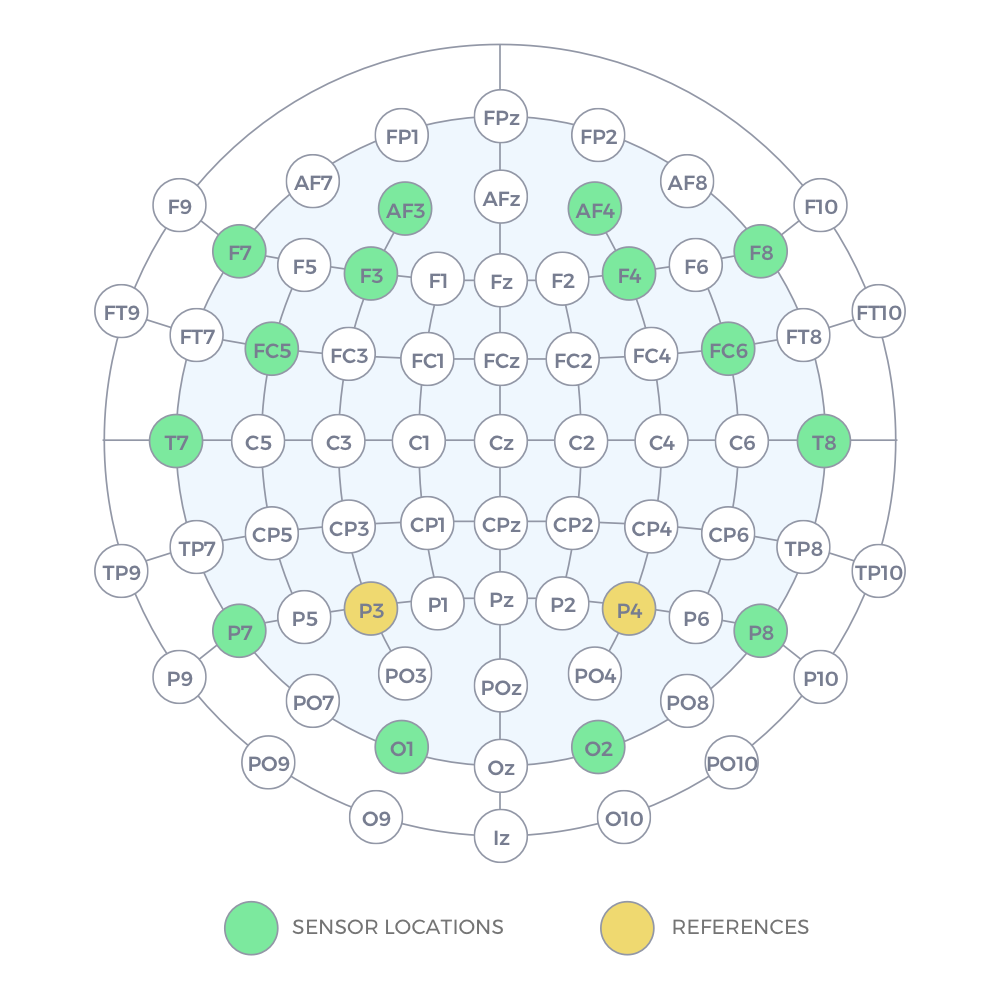
## Procedure

First, the subject answers the initial questionnaire. Afterwards, the subject puts on Emotiv EPOC+ 14 Channel Mobile EEG and Polar Sportswatch V800. To measure pupil size, the subject is guided to a booth and is shown a flashing screen to establish a baseline for pupil size and a calibration screen for Tobii X60. Before every trailer, a 15-second grey screen is shown to return the pupil size to baseline state. After a trailer, the subject answers the questionnaire shown in Table 3.4.1. This process is repeated for each of the 10 trailers shown to a subject.

# Chapter 4 Data Processing

## Brainwaves

Raw data is separated per trailer and is linearly interpolated to fix any missing data. The data for every video is then passed through Fast Fourier Transform (FFT) and eventually separated into alpha waves and beta waves for each of the 14 channels. After this is done, the ratio between the α and β waves and the α and β waves of every lobe are found. Fig. 4.1.1 shows where each channel is located and the correspondence with the datasheet value. Table 4.1.1 represents the correspondence of the lobes and the channel that detects its electrical activity.



**14**

**12**

**11**

**13**

**10**

**9**

**8**

**7**

**6**

**5**

**3**

**4**

**2**

**1**

Fig. 4.1.1 Location of each channel within dataset (original figure from [7])

Table 4.1.1: EMOTIV channels and its corresponding lobe

|  |  |
| --- | --- |
| Lobe | Channel |
| Frontal Lobe | 1, 2, 3, 4, 11, 12, 13, 14 |
| Temporal Lobe | 5, 10 |
| Parietal Lobe | 6, 9 |
| Occipital Lobe | 7, 8 |

## RRI

Raw data is separated per trailer and linearly interpolated to account for any missing data. The RRI rate of change is found per 0.25 seconds.

## Pupil Size

Raw data is linearly interpolated to account for any missing data. The position of the eye is used to calculate the Euclidean distance, which is found by the equation below.

The distance of the first point is regarded as 0. The final dataset contains the Euclidean distance of each eye and the average diameter of the pupil.

## Questionnaire

1. Labeling

To prepare for analysis, the questionnaire is converted into labels; each answer value is propagated to match the 0.25 second interval as the rest of the data is for every subject.

1. Factor Analysis

For analysis, the results from 11 items are put through factor analysis. 3 factors are found. Factor 1 correlates a good impression, liking the trailer, motivation to watch, pleasantness, interest, warmth, and high quality as one factor. This is thought to be a general factor, since people generally will like and want to watch videos with high quality and those that they have a good impression of. Factor 2, on the other hand, consists of light-hearted-ness, happiness and lack of excitement. This suggest that factor 2 may represent the comedy genre. Factor 3 groups together being emotion and lack of excitement. From these two factors, it is possible that factor 3 represents drama or romance related movies. The results of factor analysis are show in Table 4.4.2: Results from Factor Analysis. The factor scores are computed for each subject for every 0.25 seconds.

Table 4.4.2: Results from Factor Analysis

|  |  |  |  |
| --- | --- | --- | --- |
|  | Factor1 | Factor2 | Factor3 |
| Impression | **0.885** | -0.202 | -0.028 |
| Like | **0.852** | -0.082 | -0.089 |
| Want\_To\_Watch | **0.827** | -0.137 | -0.205 |
| Pleasant | **0.804** | 0.244 | -0.024 |
| Interest | **0.754** | -0.389 | -0.208 |
| Warm | **0.738** | 0.217 | 0.318 |
| Quality | **0.613** | -0.315 | 0.258 |
| Light\_Hearted | 0.373 | **0.802** | -0.108 |
| Happy | 0.486 | **0.671** | -0.333 |
| Exciting | 0.149 | **-0.556** | **-0.508** |
| Emotional | 0.469 | -0.107 | **0.707** |

# Chapter 5 Analysis

## Machine Learning using Random Forest

Random forest can perform classification or regression by using multiple decision trees and creating a “forest”. A decision tree is a series of conditions that eventually lead to a prediction or a continuous value. In order to classify an item from the dataset, the dataset is given to each tree in the forest, which individually gives a classification. Based on the classifications from each tree, the forest uses the classification that was most common among the trees [8].

## Methodology

Jupyter Notebook was used to execute the random forest algorithm. The following modules were imported to execute the code:

* pandas
* numpy
* sklearn
* seaborn
* matplotlib.plyplot

The biosignal dataset consisting of pupil, brainwaves, and RR interval data are combined with 2 types of labels: the questionnaire answers themselves and the labels generated from factor analysis. The latter is created by finding the factor score for each factor. These became the computed labels. This process is visualized by Fig. 5.2.1: Data Used for Random Forest.

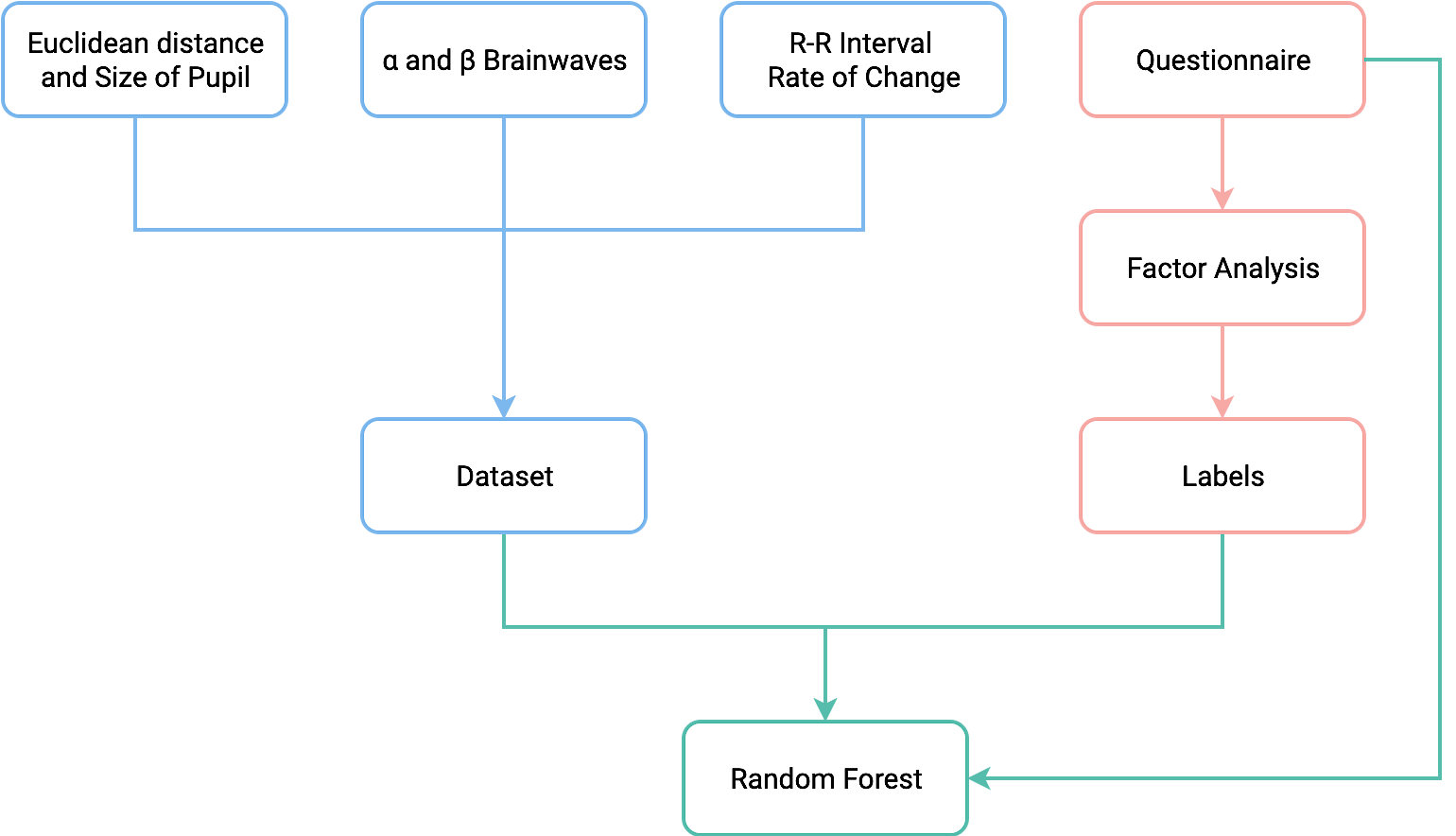


Fig. 5.2.1: Data Used for Random Forest

The datasets and labels are loaded and separated into train and test data with an 8 to 2 ratio. Each component (factors or questionnaire answers) were separated and individually put through RandomForestClassifier with the conditions specified in Table 5.2.1: Parameters for Random Forest.

Table 5.2.1: Parameters for Random Forest

|  |  |
| --- | --- |
| Parameter | Value |
| random\_state | 0 |
| min\_samples\_leaf | 5 |
| n\_estimators | 100 |

After learning, the result is evaluated and the accuracy of the train and test data is found. Based on the predictions, a confusion matrix is created. The program then finds the importance of each biosignal and displays them in the order of most to least influential in each factor or questionnaire label.

## Results

The train and test results found from each subject for each category are shown in the following tables: Table 5.3.1: Train and Test Results for All Categories for Subject 1 to 3, Table 5.3.2: Train and Test Results for All Categories for Subject 4 to 6, Table 5.3.3: Train and Test Results for All Categories for Subject 7 to 9 and Table 5.3.4: Train and Test Results for All Categories for Subject 10 to 12.

Table 5.3.1: Train and Test Results for All Categories for Subject 1 to 3

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Subject 1 | | Subject 2 | | Subject 3 | |
| Train | Test | Train | Test | Train | Test |
| Factor 1 | 0.956 | 0.640 | 0.968 | 0.628 | 0.941 | 0.521 |
| Factor 2 | 0.903 | 0.704 | 0.963 | 0.650 | 0.948 | 0.523 |
| Factor 3 | 0.959 | 0.685 | 0.970 | 0.666 | 0.954 | 0.519 |
| Like | 0.956 | 0.730 | 0.944 | 0.707 | 0.965 | 0.612 |
| Want to Watch | 0.969 | 0.676 | 0.943 | 0.703 | 0.945 | 0.552 |
| Pleasant | 0.977 | 0.700 | 0.944 | 0.707 | 0.954 | 0.620 |
| Happy | 0.939 | 0.663 | 0.950 | 0.693 | 0.967 | 0.568 |
| Emotional | 0.992 | 0.721 | 0.974 | 0.687 | 0.965 | 0.501 |
| Quality | 0.955 | 0.690 | 0.937 | 0.674 | 0.960 | 0.535 |
| Interest | 0.976 | 0.699 | 0.929 | 0.658 | 0.908 | 0.582 |
| Light-Hearted | 0.961 | 0.721 | 0.946 | 0.675 | 0.934 | 0.646 |
| Exciting | 0.955 | 0.659 | 0.969 | 0.686 | 0.911 | 0.726 |
| Warm | 0.932 | 0.644 | 0.930 | 0.770 | 0.962 | 0.548 |
| Impression | 0.960 | 0.675 | 0.970 | 0.683 | 0.968 | 0.589 |

Table 5.3.2: Train and Test Results for All Categories for Subject 4 to 6

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Subject 4 | | Subject 5 | | Subject 6 | |
| Train | Test | Train | Test | Train | Test |
| Factor 1 | 0.957 | 0.674 | 0.942 | 0.713 | 0.946 | 0.571 |
| Factor 2 | 0.943 | 0.693 | 0.938 | 0.708 | 0.934 | 0.603 |
| Factor 3 | 0.940 | 0.749 | 0.955 | 0.75 | 0.933 | 0.695 |
| Like | 0.944 | 0.783 | 0.948 | 0.804 | 0.933 | 0.687 |
| Want to Watch | 0.950 | 0.793 | 0.962 | 0.793 | 0.926 | 0.685 |
| Pleasant | 0.955 | 0.796 | 0.943 | 0.717 | 0.930 | 0.712 |
| Happy | 0.941 | 0.749 | 0.936 | 0.717 | 0.935 | 0.731 |
| Emotional | 0.946 | 0.767 | 0.953 | 0.789 | 0.936 | 0.653 |
| Quality | 0.949 | 0.753 | 0.949 | 0.791 | 0.953 | 0.602 |
| Interest | 0.948 | 0.758 | 0.956 | 0.766 | 0.943 | 0.683 |
| Light-Hearted | 0.939 | 0.800 | 0.936 | 0.717 | 0.941 | 0.724 |
| Exciting | 0.954 | 0.803 | 0.954 | 0.751 | 0.964 | 0.823 |
| Warm | 0.960 | 0.768 | 0.958 | 0.796 | 0.910 | 0.662 |
| Impression | 0.943 | 0.729 | 0.969 | 0.858 | 0.930 | 0.689 |

Table 5.3.3: Train and Test Results for All Categories for Subject 7 to 9

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Subject 7 | | Subject 8 | | Subject 9 | |
|  | Train | Test | Train | Test | Train | Test |
| Factor 1 | 0.942 | 0.566 | 0.987 | 0.959 | 0.962 | 0.583 |
| Factor 2 | 0.938 | 0.614 | 0.989 | 0.980 | 0.963 | 0.595 |
| Factor 3 | 0.916 | 0.621 | 0.986 | 0.968 | 0.952 | 0.653 |
| Like | 0.930 | 0.651 | 0.994 | 0.966 | 0.953 | 0.647 |
| Want to Watch | 0.940 | 0.629 | 0.988 | 0.972 | 0.948 | 0.662 |
| Pleasant | 0.943 | 0.829 | 0.986 | 0.953 | 0.925 | 0.667 |
| Happy | 0.897 | 0.773 | 0.985 | 0.956 | 0.957 | 0.631 |
| Emotional | 0.951 | 0.664 | 0.986 | 0.978 | 0.934 | 0.739 |
| Quality | 0.938 | 0.719 | 0.986 | 0.941 | 0.957 | 0.746 |
| Interest | 0.926 | 0.702 | 0.986 | 0.962 | 0.970 | 0.650 |
| Light-Hearted | 0.872 | 0.719 | 0.988 | 0.961 | 0.913 | 0.653 |
| Exciting | 0.919 | 0.631 | 0.987 | 0.960 | 0.937 | 0.718 |
| Warm | 0.920 | 0.690 | 0.988 | 0.965 | 0.956 | 0.576 |
| Impression | 0.915 | 0.763 | 0.99 | 0.964 | 0.957 | 0.631 |

Table 5.3.4: Train and Test Results for All Categories for Subject 10 to 12

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Subject 10 | | Subject 11 | | Subject 12 | |
|  | Train | Test | Train | Test | Train | Test |
| Factor 1 | 0.983 | 0.951 | 0.913 | 0.572 | 0.942 | 0.693 |
| Factor 2 | 0.98 | 0.948 | 0.949 | 0.563 | 0.948 | 0.708 |
| Factor 3 | 0.984 | 0.943 | 0.951 | 0.694 | 0.96 | 0.699 |
| Like | 0.982 | 0.95 | 0.968 | 0.613 | 0.956 | 0.702 |
| Want to Watch | 0.983 | 0.952 | 0.947 | 0.589 | 0.958 | 0.672 |
| Pleasant | 0.987 | 0.966 | 0.975 | 0.607 | 0.942 | 0.784 |
| Happy | 0.980 | 0.950 | 0.938 | 0.557 | 0.961 | 0.71 |
| Emotional | 0.984 | 0.948 | 0.955 | 0.661 | 0.951 | 0.697 |
| Quality | 0.993 | 0.962 | 0.950 | 0.563 | 0.970 | 0.683 |
| Interest | 0.984 | 0.940 | 0.914 | 0.609 | 0.925 | 0.698 |
| Light-Hearted | 0.981 | 0.953 | 0.942 | 0.58 | 0.955 | 0.727 |
| Exciting | 0.982 | 0.955 | 0.953 | 0.618 | 0.953 | 0.689 |
| Warm | 0.985 | 0.952 | 0.909 | 0.628 | 0.960 | 0.696 |
| Impression | 0.982 | 0.949 | 0.868 | 0.609 | 0.962 | 0.717 |

The importance for each biosignal is shown for all the subjects in Tables 5.3.5 to 5.4.160. The top 15 are shown in order. The brainwaves and their corresponding channels are found in Table 4.1.1.

Table 5.3.5: Subject 1 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.13666294 |
| 2 | Channel 3 - Channel 12 a Waves | 0.11171955 |
| 3 | Change in R-R Interval | 0.09902253 |
| 4 | Pupil Average Diameter | 0.07523236 |
| 5 | Channel 4 - Channel 11 b Waves | 0.04737083 |
| 6 | Channel 4 - Channel 11 a Waves | 0.03918603 |
| 7 | Channel 1 - Channel 14 a Waves | 0.02944484 |
| 8 | Channel 1 - Channel 14 b Waves | 0.0283782 |
| 9 | Channel 7 - Channel 8 b Waves | 0.02749936 |
| 10 | Channel 6 - Channel 9 a Waves | 0.02258474 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02214287 |
| 12 | Channel 6 - Channel 9 b Waves | 0.01957821 |
| 13 | Channel 7 b/a | 0.01790598 |
| 14 | Channel 2 - Channel 13 b Waves | 0.01709458 |
| 15 | Channel 5 - Channel 10 b Waves | 0.01662168 |

Table 5.3.6: Subject 1 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.08463924 |
| 2 | Channel 3 - Channel 12 a Waves | 0.07035491 |
| 3 | Change in R-R Interval | 0.06967062 |
| 4 | Pupil Average Diameter | 0.04873965 |
| 5 | Channel 4 - Channel 11 b Waves | 0.04822651 |
| 6 | Channel 4 - Channel 11 a Waves | 0.04737098 |
| 7 | Channel 1 - Channel 14 a Waves | 0.04278019 |
| 8 | Channel 1 - Channel 14 b Waves | 0.03755546 |
| 9 | Channel 5 - Channel 10 b Waves | 0.02626709 |
| 10 | Channel 7 - Channel 8 b Waves | 0.02442025 |
| 11 | Channel 6 - Channel 9 a Waves | 0.02298267 |
| 12 | Channel 2 - Channel 13 a Waves | 0.02256009 |
| 13 | Channel 6 - Channel 9 b Waves | 0.02200135 |
| 14 | Channel 5 - Channel 10 a Waves | 0.0196964 |
| 15 | Channel 9 b/a | 0.01898756 |

Table 5.3.7: Subject 1 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.14180468 |
| 2 | Channel 3 - Channel 12 a Waves | 0.12687265 |
| 3 | Pupil Average Diameter | 0.06624333 |
| 4 | Change in R-R Interval | 0.06130675 |
| 5 | Channel 4 - Channel 11 b Waves | 0.05070681 |
| 6 | Channel 4 - Channel 11 a Waves | 0.04755235 |
| 7 | Channel 2 - Channel 13 a Waves | 0.02706537 |
| 8 | Channel 1 - Channel 14 a Waves | 0.02687276 |
| 9 | Channel 6 - Channel 9 a Waves | 0.02323395 |
| 10 | Channel 1 - Channel 14 b Waves | 0.0219525 |
| 11 | Channel 2 - Channel 13 b Waves | 0.02179302 |
| 12 | Channel 6 - Channel 9 b Waves | 0.01969395 |
| 13 | Channel 7 - Channel 8 b Waves | 0.01925704 |
| 14 | Channel 9 b/a | 0.01886495 |
| 15 | Channel 5 - Channel 10 b Waves | 0.01715602 |

Table 5.3.8: Subject 1 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.14456987 |
| 2 | Channel 3 - Channel 12 a Waves | 0.11617665 |
| 3 | Pupil Average Diameter | 0.07633276 |
| 4 | Change in R-R Interval | 0.07517984 |
| 5 | Channel 4 - Channel 11 b Waves | 0.0483606 |
| 6 | Channel 4 - Channel 11 a Waves | 0.03527885 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03453413 |
| 8 | Channel 2 - Channel 13 a Waves | 0.02462116 |
| 9 | Channel 6 - Channel 9 a Waves | 0.02382771 |
| 10 | Channel 2 - Channel 13 b Waves | 0.02333385 |
| 11 | Channel 1 - Channel 14 a Waves | 0.02256861 |
| 12 | Channel 1 - Channel 14 b Waves | 0.0187253 |
| 13 | Channel 7 b/a | 0.01840584 |
| 14 | Channel 7 - Channel 8 b/a | 0.01726399 |
| 15 | Channel 6 - Channel 9 b Waves | 0.0171438 |

Table 5.3.9: Subject 1 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.11824596 |
| 2 | Channel 3 - Channel 12 b Waves | 0.10594615 |
| 3 | Channel 3 - Channel 12 a Waves | 0.08387155 |
| 4 | Pupil Average Diameter | 0.05270348 |
| 5 | Channel 4 - Channel 11 b Waves | 0.05192011 |
| 6 | Channel 4 - Channel 11 a Waves | 0.04673361 |
| 7 | Channel 1 - Channel 14 a Waves | 0.03276146 |
| 8 | Channel 1 - Channel 14 b Waves | 0.02942242 |
| 9 | Channel 7 - Channel 8 b Waves | 0.02536149 |
| 10 | Channel 6 - Channel 9 a Waves | 0.02456345 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02344646 |
| 12 | Channel 6 - Channel 9 b Waves | 0.02261278 |
| 13 | Channel 2 - Channel 13 b Waves | 0.01967689 |
| 14 | Channel 9 b/a | 0.01918146 |
| 15 | Channel 7 b/a | 0.01789143 |

Table 5.3.10: Subject 1 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.07993756 |
| 2 | Change in R-R Interval | 0.07531821 |
| 3 | Pupil Average Diameter | 0.06227538 |
| 4 | Channel 3 - Channel 12 a Waves | 0.05818084 |
| 5 | Channel 4 - Channel 11 b Waves | 0.03893195 |
| 6 | Channel 6 - Channel 9 a Waves | 0.03619068 |
| 7 | Channel 4 - Channel 11 a Waves | 0.03047295 |
| 8 | Channel 5 - Channel 10 b Waves | 0.02749232 |
| 9 | Channel 6 - Channel 9 b Waves | 0.02638512 |
| 10 | Channel 7 - Channel 8 b Waves | 0.02522837 |
| 11 | Channel 2 - Channel 13 b Waves | 0.02452885 |
| 12 | Channel 1 - Channel 14 b Waves | 0.02441916 |
| 13 | Channel 2 - Channel 13 a Waves | 0.02343266 |
| 14 | Channel 1 - Channel 14 a Waves | 0.02341034 |
| 15 | Channel 9 b/a | 0.02270817 |

Table 5.3.11: Subject 1 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.08059979 |
| 2 | Pupil Average Diameter | 0.07701645 |
| 3 | Channel 3 - Channel 12 a Waves | 0.05840307 |
| 4 | Change in R-R Interval | 0.0465154 |
| 5 | Channel 4 - Channel 11 b Waves | 0.04567712 |
| 6 | Channel 6 - Channel 9 a Waves | 0.03637217 |
| 7 | Channel 4 - Channel 11 a Waves | 0.03602618 |
| 8 | Channel 5 - Channel 10 b Waves | 0.02843736 |
| 9 | Channel 2 - Channel 13 a Waves | 0.02818123 |
| 10 | Channel 6 - Channel 9 b Waves | 0.02648118 |
| 11 | Channel 2 - Channel 13 b Waves | 0.02561314 |
| 12 | Channel 1 - Channel 14 b Waves | 0.02555926 |
| 13 | Channel 1 - Channel 14 a Waves | 0.0238823 |
| 14 | Channel 7 - Channel 8 b Waves | 0.02293721 |
| 15 | Channel 7 - Channel 8 b/a | 0.02194099 |

Table 5.3.12: Subject 1 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.0601532 |
| 2 | Change in R-R Interval | 0.0552663 |
| 3 | Channel 3 - Channel 12 a Waves | 0.05186463 |
| 4 | Pupil Average Diameter | 0.047504 |
| 5 | Channel 4 - Channel 11 a Waves | 0.03972551 |
| 6 | Channel 4 - Channel 11 b Waves | 0.03949281 |
| 7 | Channel 7 - Channel 8 b/a | 0.0308754 |
| 8 | Channel 6 - Channel 9 a Waves | 0.03058511 |
| 9 | Channel 7 - Channel 8 b Waves | 0.02613237 |
| 10 | Channel 7 b/a | 0.0254419 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02483838 |
| 12 | Channel 1 - Channel 14 a Waves | 0.02467742 |
| 13 | Channel 2 - Channel 13 b Waves | 0.02402417 |
| 14 | Channel 6 - Channel 9 b Waves | 0.02367779 |
| 15 | Channel 8 b/a | 0.02362873 |

Table 5.3.13: Subject 1 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.11892109 |
| 2 | Channel 3 - Channel 12 a Waves | 0.11673326 |
| 3 | Pupil Average Diameter | 0.06661427 |
| 4 | Change in R-R Interval | 0.05189137 |
| 5 | Channel 4 - Channel 11 b Waves | 0.05025584 |
| 6 | Channel 4 - Channel 11 a Waves | 0.04082123 |
| 7 | Channel 1 - Channel 14 a Waves | 0.03262132 |
| 8 | Channel 1 - Channel 14 b Waves | 0.02834384 |
| 9 | Channel 2 - Channel 13 a Waves | 0.02693655 |
| 10 | Channel 6 - Channel 9 a Waves | 0.02584032 |
| 11 | Channel 7 - Channel 8 b Waves | 0.02481624 |
| 12 | Channel 2 - Channel 13 b Waves | 0.02070402 |
| 13 | Channel 9 b/a | 0.0206375 |
| 14 | Channel 6 - Channel 9 b Waves | 0.01850021 |
| 15 | Channel 5 - Channel 10 b Waves | 0.01807712 |

Table 5.3.14: Subject 1 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.09881556 |
| 2 | Pupil Average Diameter | 0.08041732 |
| 3 | Channel 3 - Channel 12 b Waves | 0.07998959 |
| 4 | Channel 3 - Channel 12 a Waves | 0.06767664 |
| 5 | Channel 4 - Channel 11 b Waves | 0.04758532 |
| 6 | Channel 4 - Channel 11 a Waves | 0.03956215 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03381337 |
| 8 | Channel 6 - Channel 9 b Waves | 0.02671751 |
| 9 | Channel 6 - Channel 9 a Waves | 0.02539905 |
| 10 | Channel 1 - Channel 14 b Waves | 0.02453168 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02392503 |
| 12 | Channel 1 - Channel 14 a Waves | 0.02385805 |
| 13 | Channel 5 - Channel 10 b Waves | 0.02194988 |
| 14 | Channel 2 - Channel 13 b Waves | 0.01921636 |
| 15 | Channel 7 - Channel 8 a Waves | 0.01911822 |

Table 5.3.15: Subject 1 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.10409196 |
| 2 | Channel 3 - Channel 12 a Waves | 0.09372898 |
| 3 | Change in R-R Interval | 0.07817937 |
| 4 | Pupil Average Diameter | 0.05814199 |
| 5 | Channel 4 - Channel 11 a Waves | 0.04456682 |
| 6 | Channel 4 - Channel 11 b Waves | 0.03970009 |
| 7 | Channel 1 - Channel 14 a Waves | 0.03319359 |
| 8 | Channel 1 - Channel 14 b Waves | 0.03024923 |
| 9 | Channel 6 - Channel 9 a Waves | 0.02778566 |
| 10 | Channel 7 - Channel 8 b Waves | 0.0248551 |
| 11 | Channel 6 - Channel 9 b Waves | 0.02341544 |
| 12 | Channel 2 - Channel 13 a Waves | 0.02097034 |
| 13 | Channel 5 - Channel 10 b Waves | 0.01957287 |
| 14 | Channel 7 b/a | 0.01910607 |
| 15 | Channel 9 b/a | 0.0189141 |

Table 5.3.16: Subject 1 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.14109669 |
| 2 | Channel 3 - Channel 12 b Waves | 0.06097398 |
| 3 | Channel 3 - Channel 12 a Waves | 0.0590306 |
| 4 | Pupil Average Diameter | 0.05023412 |
| 5 | Channel 6 - Channel 9 a Waves | 0.03557207 |
| 6 | Channel 4 - Channel 11 a Waves | 0.03205586 |
| 7 | Channel 4 - Channel 11 b Waves | 0.03158247 |
| 8 | Channel 1 - Channel 14 b Waves | 0.0271656 |
| 9 | Channel 1 - Channel 14 a Waves | 0.02556632 |
| 10 | Channel 6 - Channel 9 b Waves | 0.0247303 |
| 11 | Channel 9 b/a | 0.024104 |
| 12 | Channel 5 - Channel 10 b Waves | 0.0240495 |
| 13 | Channel 5 - Channel 10 a Waves | 0.02171949 |
| 14 | Channel 7 - Channel 8 b Waves | 0.0217111 |
| 15 | Channel 2 - Channel 13 a Waves | 0.02158299 |

Table 5.3.17: Subject 1 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.11543254 |
| 2 | Channel 3 - Channel 12 a Waves | 0.0947456 |
| 3 | Change in R-R Interval | 0.07992024 |
| 4 | Pupil Average Diameter | 0.07301632 |
| 5 | Channel 4 - Channel 11 b Waves | 0.05024496 |
| 6 | Channel 4 - Channel 11 a Waves | 0.03546856 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03232048 |
| 8 | Channel 2 - Channel 13 a Waves | 0.02514147 |
| 9 | Channel 6 - Channel 9 a Waves | 0.0237729 |
| 10 | Channel 1 - Channel 14 a Waves | 0.02351122 |
| 11 | Channel 2 - Channel 13 b Waves | 0.02253122 |
| 12 | Channel 1 - Channel 14 b Waves | 0.02098081 |
| 13 | Channel 6 - Channel 9 b Waves | 0.0206799 |
| 14 | Channel 7 b/a | 0.01963776 |
| 15 | Channel 7 - Channel 8 b/a | 0.0194006 |

Table 5.3.18: Subject 2 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.08902218 |
| 2 | Channel 4 - Channel 11 b Waves | 0.08703566 |
| 3 | Pupil Average Diameter | 0.08153706 |
| 4 | Channel 3 - Channel 12 b Waves | 0.05747383 |
| 5 | Channel 4 - Channel 11 a Waves | 0.05078057 |
| 6 | Channel 3 - Channel 12 a Waves | 0.03816057 |
| 7 | Channel 6 - Channel 9 b Waves | 0.035649 |
| 8 | Channel 3 b/a | 0.03226139 |
| 9 | Channel 6 - Channel 9 a Waves | 0.03169324 |
| 10 | Channel 7 - Channel 8 b Waves | 0.02816302 |
| 11 | Channel 3 - Channel 12 b/a | 0.02735901 |
| 12 | Channel 7 - Channel 8 a Waves | 0.01934765 |
| 13 | Channel 9 b/a | 0.01849144 |
| 14 | Channel 5 - Channel 10 b Waves | 0.01840582 |
| 15 | Channel 5 b/a | 0.01838476 |

Table 5.3.19: Subject 2 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.11826544 |
| 2 | Pupil Average Diameter | 0.08667925 |
| 3 | Change in R-R Interval | 0.08262398 |
| 4 | Channel 4 - Channel 11 a Waves | 0.06544473 |
| 5 | Channel 3 - Channel 12 b Waves | 0.04936182 |
| 6 | Channel 6 - Channel 9 b Waves | 0.0404811 |
| 7 | Channel 3 - Channel 12 a Waves | 0.03224759 |
| 8 | Channel 6 - Channel 9 a Waves | 0.03021255 |
| 9 | Channel 3 b/a | 0.02908076 |
| 10 | Channel 3 - Channel 12 b/a | 0.02524525 |
| 11 | Channel 7 - Channel 8 b Waves | 0.0237177 |
| 12 | Channel 5 - Channel 10 b Waves | 0.01878391 |
| 13 | Channel 6 - Channel 9 b/a | 0.01866147 |
| 14 | Channel 5 - Channel 10 b/a | 0.01792096 |
| 15 | Channel 5 b/a | 0.01780554 |

Table 5.3.20: Subject 2 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.09406319 |
| 2 | Pupil Average Diameter | 0.0749892 |
| 3 | Change in R-R Interval | 0.06346588 |
| 4 | Channel 4 - Channel 11 a Waves | 0.05644993 |
| 5 | Channel 3 b/a | 0.03982128 |
| 6 | Channel 6 - Channel 9 b Waves | 0.0383773 |
| 7 | Channel 3 - Channel 12 b Waves | 0.03815392 |
| 8 | Channel 6 - Channel 9 a Waves | 0.03249115 |
| 9 | Channel 3 - Channel 12 a Waves | 0.03049485 |
| 10 | Channel 3 - Channel 12 b/a | 0.03031508 |
| 11 | Channel 7 - Channel 8 b Waves | 0.02658773 |
| 12 | Channel 2 - Channel 13 b Waves | 0.02043071 |
| 13 | Channel 6 - Channel 9 b/a | 0.02031386 |
| 14 | Channel 5 - Channel 10 a Waves | 0.02028279 |
| 15 | Channel 5 - Channel 10 b Waves | 0.01897472 |

Table 5.3.21: Subject 2 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.15379666 |
| 2 | Pupil Average Diameter | 0.0710483 |
| 3 | Channel 4 - Channel 11 b Waves | 0.0589773 |
| 4 | Channel 6 - Channel 9 a Waves | 0.04007796 |
| 5 | Channel 3 - Channel 12 b Waves | 0.03988353 |
| 6 | Channel 3 - Channel 12 a Waves | 0.03369108 |
| 7 | Channel 6 - Channel 9 b Waves | 0.03363544 |
| 8 | Channel 4 - Channel 11 a Waves | 0.03228286 |
| 9 | Channel 3 b/a | 0.02643985 |
| 10 | Channel 5 - Channel 10 b Waves | 0.02625135 |
| 11 | Channel 7 - Channel 8 b Waves | 0.02440845 |
| 12 | Channel 3 - Channel 12 b/a | 0.02219812 |
| 13 | Channel 7 - Channel 8 a Waves | 0.02119579 |
| 14 | Channel 1 - Channel 14 b Waves | 0.02064423 |
| 15 | Channel 4 b/a | 0.01872108 |

Table 5.3.22: Subject 2 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.17041006 |
| 2 | Pupil Average Diameter | 0.05934367 |
| 3 | Channel 4 - Channel 11 b Waves | 0.05214341 |
| 4 | Channel 6 - Channel 9 a Waves | 0.04287736 |
| 5 | Channel 3 - Channel 12 b Waves | 0.0419923 |
| 6 | Channel 3 - Channel 12 a Waves | 0.03582198 |
| 7 | Channel 6 - Channel 9 b Waves | 0.03231957 |
| 8 | Channel 3 b/a | 0.0273093 |
| 9 | Channel 4 - Channel 11 a Waves | 0.02624827 |
| 10 | Channel 5 - Channel 10 b Waves | 0.02531461 |
| 11 | Channel 3 - Channel 12 b/a | 0.02381725 |
| 12 | Channel 7 - Channel 8 b Waves | 0.02354645 |
| 13 | Channel 1 - Channel 14 b Waves | 0.02040031 |
| 14 | Channel 7 - Channel 8 a Waves | 0.02026657 |
| 15 | Channel 5 - Channel 10 a Waves | 0.01812845 |

Table 5.3.23: Subject 2 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.15379666 |
| 2 | Pupil Average Diameter | 0.0710483 |
| 3 | Channel 4 - Channel 11 b Waves | 0.0589773 |
| 4 | Channel 6 - Channel 9 a Waves | 0.04007796 |
| 5 | Channel 3 - Channel 12 b Waves | 0.03988353 |
| 6 | Channel 3 - Channel 12 a Waves | 0.03369108 |
| 7 | Channel 6 - Channel 9 b Waves | 0.03363544 |
| 8 | Channel 4 - Channel 11 a Waves | 0.03228286 |
| 9 | Channel 3 b/a | 0.02643985 |
| 10 | Channel 5 - Channel 10 b Waves | 0.02625135 |
| 11 | Channel 7 - Channel 8 b Waves | 0.02440845 |
| 12 | Channel 3 - Channel 12 b/a | 0.02219812 |
| 13 | Channel 7 - Channel 8 a Waves | 0.02119579 |
| 14 | Channel 1 - Channel 14 b Waves | 0.02064423 |
| 15 | Channel 4 b/a | 0.01872108 |

Table 5.3.24: Subject 2 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.10079986 |
| 2 | Change in R-R Interval | 0.0737792 |
| 3 | Pupil Average Diameter | 0.07091937 |
| 4 | Channel 3 - Channel 12 b Waves | 0.05560149 |
| 5 | Channel 4 - Channel 11 a Waves | 0.0463162 |
| 6 | Channel 3 - Channel 12 a Waves | 0.03860454 |
| 7 | Channel 3 b/a | 0.03555725 |
| 8 | Channel 3 - Channel 12 b/a | 0.03284108 |
| 9 | Channel 7 - Channel 8 b Waves | 0.0299322 |
| 10 | Channel 6 - Channel 9 b Waves | 0.02722319 |
| 11 | Channel 6 - Channel 9 a Waves | 0.02552597 |
| 12 | Channel 9 b/a | 0.0230638 |
| 13 | Channel 6 - Channel 9 b/a | 0.02164591 |
| 14 | Channel 5 - Channel 10 b Waves | 0.02143868 |
| 15 | Channel 7 - Channel 8 a Waves | 0.02036623 |

Table 5.3.25: Subject 2 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.10826007 |
| 2 | Change in R-R Interval | 0.07526855 |
| 3 | Channel 6 - Channel 9 b Waves | 0.05713556 |
| 4 | Pupil Average Diameter | 0.04677267 |
| 5 | Channel 3 - Channel 12 b Waves | 0.04603649 |
| 6 | Channel 4 - Channel 11 a Waves | 0.04392333 |
| 7 | Channel 3 - Channel 12 a Waves | 0.03787762 |
| 8 | Channel 5 - Channel 10 b Waves | 0.02807833 |
| 9 | Channel 3 - Channel 12 b/a | 0.02762925 |
| 10 | Channel 6 - Channel 9 a Waves | 0.02732059 |
| 11 | Channel 7 - Channel 8 b Waves | 0.02622663 |
| 12 | Channel 3 b/a | 0.02596253 |
| 13 | Channel 1 - Channel 14 b Waves | 0.02188615 |
| 14 | Channel 4 b/a | 0.02015073 |
| 15 | Channel 7 - Channel 8 a Waves | 0.02008841 |

Table 5.3.26: Subject 2 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.08794221 |
| 2 | Change in R-R Interval | 0.08188539 |
| 3 | Channel 4 - Channel 11 b Waves | 0.06258133 |
| 4 | Channel 3 - Channel 12 b Waves | 0.05454556 |
| 5 | Channel 4 - Channel 11 a Waves | 0.04317302 |
| 6 | Channel 3 - Channel 12 a Waves | 0.03880498 |
| 7 | Channel 6 - Channel 9 b Waves | 0.03633136 |
| 8 | Channel 3 b/a | 0.02968973 |
| 9 | Channel 6 - Channel 9 a Waves | 0.02805813 |
| 10 | Channel 7 - Channel 8 b Waves | 0.02779787 |
| 11 | Channel 3 - Channel 12 b/a | 0.02643676 |
| 12 | Channel 5 b/a | 0.02404238 |
| 13 | Channel 5 - Channel 10 b/a | 0.02179455 |
| 14 | Channel 12 b/a | 0.02140232 |
| 15 | Channel 7 - Channel 8 a Waves | 0.01968079 |

Table 5.3.27: Subject 2 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.10099946 |
| 2 | Channel 4 - Channel 11 b Waves | 0.0547486 |
| 3 | Pupil Average Diameter | 0.05271547 |
| 4 | Channel 3 - Channel 12 b Waves | 0.04339819 |
| 5 | Channel 7 - Channel 8 b Waves | 0.03935961 |
| 6 | Channel 3 - Channel 12 a Waves | 0.03632163 |
| 7 | Channel 4 - Channel 11 a Waves | 0.03480177 |
| 8 | Channel 3 b/a | 0.03188675 |
| 9 | Channel 6 - Channel 9 b Waves | 0.02581171 |
| 10 | Channel 3 - Channel 12 b/a | 0.02577089 |
| 11 | Channel 7 - Channel 8 a Waves | 0.0246009 |
| 12 | Channel 6 - Channel 9 a Waves | 0.0233299 |
| 13 | Channel 5 - Channel 10 b Waves | 0.02290288 |
| 14 | Channel 9 b/a | 0.02246525 |
| 15 | Channel 1 - Channel 14 b/a | 0.02141978 |

Table 5.3.28: Subject 2 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.12480214 |
| 2 | Channel 4 - Channel 11 a Waves | 0.08460557 |
| 3 | Change in R-R Interval | 0.08209109 |
| 4 | Pupil Average Diameter | 0.0460432 |
| 5 | Channel 3 - Channel 12 b Waves | 0.04502413 |
| 6 | Channel 3 - Channel 12 a Waves | 0.03750124 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03600698 |
| 8 | Channel 3 b/a | 0.0314772 |
| 9 | Channel 3 - Channel 12 b/a | 0.02872516 |
| 10 | Channel 6 - Channel 9 a Waves | 0.02357993 |
| 11 | Channel 7 - Channel 8 a Waves | 0.02126816 |
| 12 | Channel 6 - Channel 9 b Waves | 0.0211907 |
| 13 | Channel 5 - Channel 10 b/a | 0.0201042 |
| 14 | Channel 5 b/a | 0.01917433 |
| 15 | Channel 2 - Channel 13 b Waves | 0.0186764 |

Table 5.3.29: Subject 2 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.09018007 |
| 2 | Channel 3 - Channel 12 b Waves | 0.07970772 |
| 3 | Channel 4 - Channel 11 b Waves | 0.06969028 |
| 4 | Channel 3 - Channel 12 a Waves | 0.06888865 |
| 5 | Pupil Average Diameter | 0.05819356 |
| 6 | Channel 3 b/a | 0.04377081 |
| 7 | Channel 3 - Channel 12 b/a | 0.0343921 |
| 8 | Channel 4 - Channel 11 a Waves | 0.03202975 |
| 9 | Channel 6 - Channel 9 b Waves | 0.0318669 |
| 10 | Channel 6 - Channel 9 a Waves | 0.02599222 |
| 11 | Channel 5 - Channel 10 b Waves | 0.02131623 |
| 12 | Channel 12 b/a | 0.02097841 |
| 13 | Channel 6 - Channel 9 b/a | 0.01963108 |
| 14 | Channel 5 b/a | 0.01948134 |
| 15 | Channel 7 - Channel 8 b Waves | 0.01872612 |

Table 5.3.30: Subject 2 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.09779197 |
| 2 | Channel 4 - Channel 11 b Waves | 0.09176016 |
| 3 | Channel 3 - Channel 12 a Waves | 0.05681923 |
| 4 | Channel 3 - Channel 12 b Waves | 0.0541361 |
| 5 | Pupil Average Diameter | 0.05062847 |
| 6 | Channel 4 - Channel 11 a Waves | 0.04230705 |
| 7 | Channel 6 - Channel 9 b Waves | 0.03296987 |
| 8 | Channel 3 b/a | 0.03273105 |
| 9 | Channel 7 - Channel 8 b Waves | 0.02941952 |
| 10 | Channel 6 - Channel 9 a Waves | 0.0287571 |
| 11 | Channel 3 - Channel 12 b/a | 0.02434148 |
| 12 | Channel 5 - Channel 10 b Waves | 0.02025727 |
| 13 | Channel 1 - Channel 14 b Waves | 0.01983366 |
| 14 | Channel 7 - Channel 8 a Waves | 0.01959031 |
| 15 | Channel 5 - Channel 10 a Waves | 0.01896906 |

Table 5.3.31: Subject 3 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.13105374 |
| 2 | Pupil Average Diameter | 0.07610821 |
| 3 | Channel 2 - Channel 13 b Waves | 0.05384122 |
| 4 | Channel 5 - Channel 10 b Waves | 0.05105915 |
| 5 | Channel 2 - Channel 13 a Waves | 0.03632294 |
| 6 | Channel 5 b/a | 0.03324809 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03102582 |
| 8 | Channel 6 - Channel 9 b Waves | 0.02752315 |
| 9 | Channel 5 - Channel 10 b/a | 0.02424875 |
| 10 | Channel 7 - Channel 8 a Waves | 0.02352812 |
| 11 | Channel 6 - Channel 9 a Waves | 0.02325551 |
| 12 | Channel 13 b/a | 0.02302689 |
| 13 | Channel 4 - Channel 11 b Waves | 0.02132147 |
| 14 | Channel 5 - Channel 10 a Waves | 0.02074978 |
| 15 | Channel 2 - Channel 13 b/a | 0.01976257 |

Table 5.3.32: Subject 3 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.08906712 |
| 2 | Pupil Average Diameter | 0.08454296 |
| 3 | Channel 2 - Channel 13 b Waves | 0.05663925 |
| 4 | Channel 5 - Channel 10 b Waves | 0.05616909 |
| 5 | Channel 5 b/a | 0.03723609 |
| 6 | Channel 2 - Channel 13 a Waves | 0.03678111 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03239467 |
| 8 | Channel 6 - Channel 9 b Waves | 0.02444425 |
| 9 | Channel 5 - Channel 10 b/a | 0.02421376 |
| 10 | Channel 13 b/a | 0.02369772 |
| 11 | Channel 4 - Channel 11 b Waves | 0.0233956 |
| 12 | Channel 6 - Channel 9 a Waves | 0.02237225 |
| 13 | Channel 1 - Channel 14 b Waves | 0.02141901 |
| 14 | Channel 7 - Channel 8 a Waves | 0.02138032 |
| 15 | Channel 5 - Channel 10 a Waves | 0.02093688 |

Table 5.3.33: Subject 3 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.08777378 |
| 2 | Channel 2 - Channel 13 b Waves | 0.06579742 |
| 3 | Pupil Average Diameter | 0.06239136 |
| 4 | Channel 2 - Channel 13 a Waves | 0.0414296 |
| 5 | Channel 5 - Channel 10 b Waves | 0.03696626 |
| 6 | Channel 7 - Channel 8 b Waves | 0.03511462 |
| 7 | Channel 5 b/a | 0.03006217 |
| 8 | Channel 6 - Channel 9 b Waves | 0.02844158 |
| 9 | Channel 7 - Channel 8 a Waves | 0.02544722 |
| 10 | Channel 5 - Channel 10 b/a | 0.02311887 |
| 11 | Channel 6 - Channel 9 a Waves | 0.0230228 |
| 12 | Channel 4 - Channel 11 b Waves | 0.02292008 |
| 13 | Channel 13 b/a | 0.02269181 |
| 14 | Channel 11 b/a | 0.02217939 |
| 15 | Channel 4 - Channel 11 a Waves | 0.02167708 |

Table 5.3.34: Subject 3 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.0933411 |
| 2 | Change in R-R Interval | 0.06283832 |
| 3 | Channel 2 - Channel 13 b Waves | 0.0430555 |
| 4 | Channel 6 - Channel 9 b Waves | 0.03832346 |
| 5 | Channel 6 - Channel 9 a Waves | 0.03110822 |
| 6 | Channel 5 - Channel 10 b Waves | 0.02912378 |
| 7 | Channel 2 - Channel 13 a Waves | 0.02883207 |
| 8 | Channel 7 - Channel 8 b Waves | 0.02833578 |
| 9 | Channel 7 - Channel 8 a Waves | 0.02654203 |
| 10 | Channel 3 - Channel 12 b Waves | 0.02534058 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02446906 |
| 12 | Channel 2 - Channel 13 b/a | 0.02399958 |
| 13 | Channel 3 - Channel 12 a Waves | 0.02351536 |
| 14 | Channel 2 b/a | 0.02341251 |
| 15 | Channel 13 b/a | 0.02326636 |

Table 5.3.35: Subject 3 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.0686899 |
| 2 | Channel 5 - Channel 10 b Waves | 0.05763485 |
| 3 | Pupil Average Diameter | 0.05288346 |
| 4 | Channel 2 - Channel 13 b Waves | 0.04952399 |
| 5 | Channel 2 - Channel 13 a Waves | 0.04488606 |
| 6 | Channel 5 b/a | 0.04417827 |
| 7 | Channel 6 - Channel 9 b Waves | 0.02918547 |
| 8 | Channel 7 - Channel 8 b Waves | 0.02794923 |
| 9 | Channel 6 - Channel 9 a Waves | 0.02664556 |
| 10 | Channel 5 - Channel 10 b/a | 0.02607853 |
| 11 | Channel 13 b/a | 0.02479638 |
| 12 | Channel 7 - Channel 8 a Waves | 0.0246262 |
| 13 | Channel 4 - Channel 11 b Waves | 0.02300452 |
| 14 | Channel 5 - Channel 10 a Waves | 0.02293175 |
| 15 | Channel 3 - Channel 12 b Waves | 0.02290193 |

Table 5.3.36: Subject 3 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.07965019 |
| 2 | Pupil Average Diameter | 0.06758108 |
| 3 | Channel 5 - Channel 10 b Waves | 0.06085845 |
| 4 | Channel 2 - Channel 13 b Waves | 0.04171811 |
| 5 | Channel 6 - Channel 9 b Waves | 0.03677716 |
| 6 | Channel 5 b/a | 0.03308378 |
| 7 | Channel 2 - Channel 13 a Waves | 0.03161786 |
| 8 | Channel 6 - Channel 9 a Waves | 0.03062251 |
| 9 | Channel 7 - Channel 8 b Waves | 0.02633551 |
| 10 | Channel 7 - Channel 8 a Waves | 0.02362316 |
| 11 | Channel 13 b/a | 0.02287965 |
| 12 | Channel 2 - Channel 13 b/a | 0.02279921 |
| 13 | Channel 3 - Channel 12 b Waves | 0.02252798 |
| 14 | Channel 3 - Channel 12 a Waves | 0.02230344 |
| 15 | Channel 5 - Channel 10 a Waves | 0.02224573 |

Table 5.3.37: Subject 3 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.10550986 |
| 2 | Pupil Average Diameter | 0.05353823 |
| 3 | Channel 2 - Channel 13 b Waves | 0.04364888 |
| 4 | Channel 5 - Channel 10 b Waves | 0.04173563 |
| 5 | Channel 5 b/a | 0.03661651 |
| 6 | Channel 7 - Channel 8 b Waves | 0.03310719 |
| 7 | Channel 7 - Channel 8 a Waves | 0.02944624 |
| 8 | Channel 2 - Channel 13 a Waves | 0.0282151 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02795825 |
| 10 | Channel 5 - Channel 10 b/a | 0.02659471 |
| 11 | Channel 6 - Channel 9 b Waves | 0.02572926 |
| 12 | Channel 6 - Channel 9 a Waves | 0.02491977 |
| 13 | Channel 1 - Channel 14 a Waves | 0.02269288 |
| 14 | Channel 4 - Channel 11 a Waves | 0.02256856 |
| 15 | Channel 1 - Channel 14 b Waves | 0.02255554 |

Table 5.3.38: Subject 3 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.06920656 |
| 2 | Change in R-R Interval | 0.06904334 |
| 3 | Channel 2 - Channel 13 b Waves | 0.05063516 |
| 4 | Channel 5 - Channel 10 b Waves | 0.04901121 |
| 5 | Channel 5 b/a | 0.03544043 |
| 6 | Channel 7 - Channel 8 b Waves | 0.03111035 |
| 7 | Channel 2 - Channel 13 a Waves | 0.02991871 |
| 8 | Channel 6 - Channel 9 b Waves | 0.02682766 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02670773 |
| 10 | Channel 7 - Channel 8 a Waves | 0.02611951 |
| 11 | Channel 13 b/a | 0.02584923 |
| 12 | Channel 6 - Channel 9 a Waves | 0.02527599 |
| 13 | Channel 5 - Channel 10 b/a | 0.02409589 |
| 14 | Channel 2 - Channel 13 b/a | 0.02362586 |
| 15 | Channel 5 - Channel 10 a Waves | 0.02284898 |

Table 5.3.39: Subject 3 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.1026881 |
| 2 | Pupil Average Diameter | 0.07980698 |
| 3 | Channel 5 - Channel 10 b Waves | 0.04576285 |
| 4 | Channel 2 - Channel 13 b Waves | 0.04213214 |
| 5 | Channel 5 b/a | 0.036964 |
| 6 | Channel 2 - Channel 13 a Waves | 0.03222696 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03115358 |
| 8 | Channel 5 - Channel 10 b/a | 0.02813359 |
| 9 | Channel 6 - Channel 9 b Waves | 0.02715865 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02630213 |
| 11 | Channel 6 - Channel 9 a Waves | 0.02340128 |
| 12 | Channel 7 - Channel 8 a Waves | 0.02189446 |
| 13 | Channel 6 b/a | 0.02143315 |
| 14 | Channel 5 - Channel 10 a Waves | 0.02095581 |
| 15 | Channel 7 - Channel 8 b/a | 0.02062681 |

Table 5.3.40: Subject 3 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.08991785 |
| 2 | Pupil Average Diameter | 0.05737523 |
| 3 | Channel 2 - Channel 13 b Waves | 0.05177264 |
| 4 | Channel 5 - Channel 10 b Waves | 0.04712126 |
| 5 | Channel 5 b/a | 0.03712336 |
| 6 | Channel 6 - Channel 9 b Waves | 0.03248079 |
| 7 | Channel 2 - Channel 13 a Waves | 0.03138862 |
| 8 | Channel 6 - Channel 9 a Waves | 0.02813885 |
| 9 | Channel 5 - Channel 10 b/a | 0.02612833 |
| 10 | Channel 7 - Channel 8 b Waves | 0.02535635 |
| 11 | Channel 7 - Channel 8 a Waves | 0.02456897 |
| 12 | Channel 4 - Channel 11 b Waves | 0.02455727 |
| 13 | Channel 3 - Channel 12 b Waves | 0.02423487 |
| 14 | Channel 3 - Channel 12 a Waves | 0.02301236 |
| 15 | Channel 5 - Channel 10 a Waves | 0.02242456 |

Table 5.3.41: Subject 3 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.10063901 |
| 2 | Pupil Average Diameter | 0.07443009 |
| 3 | Channel 5 - Channel 10 b Waves | 0.0598141 |
| 4 | Channel 2 - Channel 13 b Waves | 0.04318473 |
| 5 | Channel 6 - Channel 9 b Waves | 0.03671099 |
| 6 | Channel 5 b/a | 0.03566202 |
| 7 | Channel 2 - Channel 13 a Waves | 0.03300426 |
| 8 | Channel 5 - Channel 10 b/a | 0.02682214 |
| 9 | Channel 6 - Channel 9 a Waves | 0.02651994 |
| 10 | Channel 3 - Channel 12 b Waves | 0.02619368 |
| 11 | Channel 7 - Channel 8 b Waves | 0.02520468 |
| 12 | Channel 5 - Channel 10 a Waves | 0.0221242 |
| 13 | Channel 1 - Channel 14 b Waves | 0.02181064 |
| 14 | Channel 3 - Channel 12 a Waves | 0.02151056 |
| 15 | Channel 6 b/a | 0.02121386 |

Table 5.3.42: Subject 3 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.10067445 |
| 2 | Change in R-R Interval | 0.08329689 |
| 3 | Channel 2 - Channel 13 b Waves | 0.05981451 |
| 4 | Channel 5 - Channel 10 b Waves | 0.05029337 |
| 5 | Channel 2 - Channel 13 a Waves | 0.03548316 |
| 6 | Channel 5 b/a | 0.03446835 |
| 7 | Channel 6 - Channel 9 b Waves | 0.02811989 |
| 8 | Channel 6 - Channel 9 a Waves | 0.025851 |
| 9 | Channel 7 - Channel 8 b Waves | 0.02515871 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02370985 |
| 11 | Channel 5 - Channel 10 b/a | 0.02367699 |
| 12 | Channel 7 - Channel 8 a Waves | 0.02193088 |
| 13 | Right Eye Euclidean Distance | 0.0209215 |
| 14 | Channel 5 - Channel 10 a Waves | 0.02088245 |
| 15 | Channel 13 b/a | 0.02066182 |

Table 5.3.43: Subject 3 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.12755366 |
| 2 | Pupil Average Diameter | 0.0500631 |
| 3 | Channel 2 - Channel 13 b Waves | 0.04184487 |
| 4 | Channel 2 - Channel 13 a Waves | 0.03634805 |
| 5 | Channel 5 - Channel 10 b Waves | 0.03291725 |
| 6 | Channel 5 b/a | 0.03149169 |
| 7 | Channel 6 - Channel 9 b Waves | 0.02886273 |
| 8 | Channel 7 - Channel 8 b Waves | 0.02871324 |
| 9 | Channel 4 - Channel 11 b Waves | 0.0264508 |
| 10 | Channel 7 - Channel 8 a Waves | 0.02486559 |
| 11 | Channel 6 - Channel 9 a Waves | 0.02372255 |
| 12 | Channel 5 - Channel 10 b/a | 0.02345548 |
| 13 | Channel 6 b/a | 0.02191279 |
| 14 | Channel 13 b/a | 0.02156253 |
| 15 | Channel 1 - Channel 14 b Waves | 0.0214285 |

Table 5.3.44: Subject 4 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.14037981 |
| 2 | Channel 3 - Channel 12 b Waves | 0.10053827 |
| 3 | Channel 6 - Channel 9 b Waves | 0.08191087 |
| 4 | Channel 3 - Channel 12 a Waves | 0.07273261 |
| 5 | Channel 5 - Channel 10 b Waves | 0.06499376 |
| 6 | Pupil Average Diameter | 0.0641561 |
| 7 | Channel 6 - Channel 9 a Waves | 0.02691925 |
| 8 | Channel 5 - Channel 10 a Waves | 0.02563629 |
| 9 | Channel 3 b/a | 0.02478819 |
| 10 | Channel 2 - Channel 13 b Waves | 0.02405166 |
| 11 | Channel 4 b/a | 0.01886238 |
| 12 | Channel 4 - Channel 11 b Waves | 0.01824484 |
| 13 | Channel 1 - Channel 14 b/a | 0.01813669 |
| 14 | Channel 4 - Channel 11 b/a | 0.01759937 |
| 15 | Channel 1 b/a | 0.01543586 |

Table 5.3.45: Subject 4 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.12776816 |
| 2 | Channel 3 - Channel 12 b Waves | 0.10454955 |
| 3 | Channel 6 - Channel 9 b Waves | 0.08212164 |
| 4 | Channel 3 - Channel 12 a Waves | 0.07371294 |
| 5 | Channel 5 - Channel 10 b Waves | 0.07244756 |
| 6 | Pupil Average Diameter | 0.06406526 |
| 7 | Channel 5 - Channel 10 a Waves | 0.0293172 |
| 8 | Channel 6 - Channel 9 a Waves | 0.02534009 |
| 9 | Channel 3 b/a | 0.02358758 |
| 10 | Channel 2 - Channel 13 b Waves | 0.02156073 |
| 11 | Channel 1 b/a | 0.0195914 |
| 12 | Channel 4 - Channel 11 b Waves | 0.0192429 |
| 13 | Channel 4 - Channel 11 b/a | 0.0187059 |
| 14 | Channel 1 - Channel 14 b Waves | 0.01827856 |
| 15 | Channel 1 - Channel 14 b/a | 0.01789332 |

Table 5.3.46: Subject 4 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 6 - Channel 9 b Waves | 0.12000211 |
| 2 | Change in R-R Interval | 0.10511754 |
| 3 | Channel 3 - Channel 12 b Waves | 0.10510383 |
| 4 | Channel 3 - Channel 12 a Waves | 0.08378196 |
| 5 | Channel 5 - Channel 10 b Waves | 0.07390913 |
| 6 | Channel 6 - Channel 9 a Waves | 0.04271606 |
| 7 | Pupil Average Diameter | 0.04158361 |
| 8 | Channel 5 - Channel 10 a Waves | 0.03272283 |
| 9 | Channel 2 - Channel 13 b Waves | 0.02146206 |
| 10 | Channel 1 b/a | 0.01998986 |
| 11 | Channel 3 b/a | 0.01986545 |
| 12 | Channel 4 b/a | 0.01914273 |
| 13 | Channel 4 - Channel 11 b Waves | 0.01788834 |
| 14 | Channel 1 - Channel 14 b/a | 0.01708412 |
| 15 | Channel 4 - Channel 11 b/a | 0.01555427 |

Table 5.3.47: Subject 4 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.13588226 |
| 2 | Channel 3 - Channel 12 b Waves | 0.13519569 |
| 3 | Pupil Average Diameter | 0.11717035 |
| 4 | Channel 3 - Channel 12 a Waves | 0.08506852 |
| 5 | Channel 5 - Channel 10 b Waves | 0.08280499 |
| 6 | Channel 6 - Channel 9 b Waves | 0.05637144 |
| 7 | Channel 5 - Channel 10 a Waves | 0.03504998 |
| 8 | Channel 6 - Channel 9 a Waves | 0.02648489 |
| 9 | Channel 3 b/a | 0.0224376 |
| 10 | Channel 2 - Channel 13 b Waves | 0.01395572 |
| 11 | Channel 1 - Channel 14 b Waves | 0.01382334 |
| 12 | Channel 1 - Channel 14 a Waves | 0.01334315 |
| 13 | Channel 1 - Channel 14 b/a | 0.01285196 |
| 14 | Channel 1 b/a | 0.01272006 |
| 15 | Channel 4 - Channel 11 b Waves | 0.01166369 |

Table 5.3.48: Subject 4 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.12314913 |
| 2 | Pupil Average Diameter | 0.11419728 |
| 3 | Channel 3 - Channel 12 b Waves | 0.10291332 |
| 4 | Channel 3 - Channel 12 a Waves | 0.10180035 |
| 5 | Channel 6 - Channel 9 b Waves | 0.0638106 |
| 6 | Channel 5 - Channel 10 b Waves | 0.03891719 |
| 7 | Channel 6 - Channel 9 a Waves | 0.0259113 |
| 8 | Channel 3 b/a | 0.0235591 |
| 9 | Channel 5 - Channel 10 a Waves | 0.02083379 |
| 10 | Channel 7 - Channel 8 b Waves | 0.0181788 |
| 11 | Channel 4 - Channel 11 b Waves | 0.01577336 |
| 12 | Channel 7 - Channel 8 a Waves | 0.01473363 |
| 13 | Channel 11 b/a | 0.01466663 |
| 14 | Channel 1 - Channel 14 a Waves | 0.01458359 |
| 15 | Channel 1 - Channel 14 b Waves | 0.01436359 |

Table 5.3.49: Subject 4 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.12706038 |
| 2 | Channel 3 - Channel 12 b Waves | 0.10244582 |
| 3 | Channel 3 - Channel 12 a Waves | 0.08554295 |
| 4 | Channel 5 - Channel 10 b Waves | 0.07563844 |
| 5 | Pupil Average Diameter | 0.07013181 |
| 6 | Channel 6 - Channel 9 b Waves | 0.04517712 |
| 7 | Channel 5 - Channel 10 a Waves | 0.02541486 |
| 8 | Channel 3 b/a | 0.02475941 |
| 9 | Channel 1 - Channel 14 a Waves | 0.02181498 |
| 10 | Channel 2 - Channel 13 b Waves | 0.02136702 |
| 11 | Channel 6 - Channel 9 a Waves | 0.02065883 |
| 12 | Channel 1 - Channel 14 b Waves | 0.02061062 |
| 13 | Channel 1 b/a | 0.01942771 |
| 14 | Channel 4 - Channel 11 b Waves | 0.01919319 |
| 15 | Channel 1 - Channel 14 b/a | 0.01715593 |

Table 5.3.50: Subject 4 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.18271178 |
| 2 | Channel 3 - Channel 12 b Waves | 0.09600862 |
| 3 | Channel 6 - Channel 9 b Waves | 0.08119335 |
| 4 | Pupil Average Diameter | 0.05149003 |
| 5 | Channel 3 - Channel 12 a Waves | 0.05104911 |
| 6 | Channel 5 - Channel 10 b Waves | 0.04894588 |
| 7 | Channel 6 - Channel 9 a Waves | 0.03845349 |
| 8 | Channel 5 - Channel 10 a Waves | 0.03591805 |
| 9 | Channel 2 - Channel 13 b Waves | 0.02618743 |
| 10 | Channel 1 - Channel 14 b Waves | 0.01760361 |
| 11 | Channel 4 - Channel 11 b Waves | 0.01706215 |
| 12 | Channel 3 b/a | 0.01700953 |
| 13 | Channel 7 - Channel 8 b Waves | 0.01682046 |
| 14 | Channel 1 - Channel 14 a Waves | 0.01571457 |
| 15 | Channel 2 - Channel 13 a Waves | 0.01539053 |

Table 5.3.51: Subject 4 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.14206258 |
| 2 | Channel 3 - Channel 12 a Waves | 0.12255447 |
| 3 | Channel 3 - Channel 12 b Waves | 0.11568939 |
| 4 | Channel 6 - Channel 9 b Waves | 0.07551597 |
| 5 | Channel 5 - Channel 10 b Waves | 0.06315641 |
| 6 | Pupil Average Diameter | 0.05299686 |
| 7 | Channel 5 - Channel 10 a Waves | 0.02758271 |
| 8 | Channel 3 b/a | 0.02654352 |
| 9 | Channel 2 - Channel 13 b Waves | 0.02546179 |
| 10 | Channel 6 - Channel 9 a Waves | 0.02025651 |
| 11 | Channel 1 b/a | 0.01655299 |
| 12 | Channel 4 - Channel 11 b Waves | 0.01574834 |
| 13 | Channel 1 - Channel 14 b/a | 0.01564576 |
| 14 | Channel 14 b/a | 0.0145367 |
| 15 | Channel 1 - Channel 14 b Waves | 0.01421449 |

Table 5.3.52: Subject 4 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.13541231 |
| 2 | Channel 6 - Channel 9 b Waves | 0.11358026 |
| 3 | Channel 5 - Channel 10 b Waves | 0.07459839 |
| 4 | Channel 3 - Channel 12 a Waves | 0.07166807 |
| 5 | Channel 3 - Channel 12 b Waves | 0.06964856 |
| 6 | Pupil Average Diameter | 0.03606555 |
| 7 | Channel 6 - Channel 9 a Waves | 0.03041442 |
| 8 | Channel 2 - Channel 13 b Waves | 0.02415959 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02268534 |
| 10 | Channel 3 b/a | 0.02147769 |
| 11 | Channel 5 - Channel 10 a Waves | 0.02102086 |
| 12 | Channel 4 - Channel 11 b/a | 0.01861987 |
| 13 | Channel 1 - Channel 14 b Waves | 0.01761676 |
| 14 | Channel 4 b/a | 0.01732027 |
| 15 | Channel 2 - Channel 13 a Waves | 0.0171087 |

Table 5.3.53: Subject 4 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.1717851 |
| 2 | Channel 3 - Channel 12 b Waves | 0.0985761 |
| 3 | Channel 3 - Channel 12 a Waves | 0.0698162 |
| 4 | Channel 5 - Channel 10 b Waves | 0.06890262 |
| 5 | Channel 6 - Channel 9 b Waves | 0.05175792 |
| 6 | Pupil Average Diameter | 0.04413724 |
| 7 | Channel 5 - Channel 10 a Waves | 0.03554059 |
| 8 | Channel 2 - Channel 13 b Waves | 0.02757361 |
| 9 | Channel 6 - Channel 9 a Waves | 0.02553273 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02274969 |
| 11 | Channel 3 b/a | 0.02119131 |
| 12 | Channel 4 b/a | 0.01866 |
| 13 | Channel 7 - Channel 8 a Waves | 0.01622306 |
| 14 | Channel 1 - Channel 14 b Waves | 0.01572939 |
| 15 | Channel 5 b/a | 0.01539714 |

Table 5.3.54: Subject 4 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.17166435 |
| 2 | Pupil Average Diameter | 0.1341278 |
| 3 | Channel 3 - Channel 12 a Waves | 0.08604258 |
| 4 | Channel 3 - Channel 12 b Waves | 0.08554435 |
| 5 | Channel 6 - Channel 9 b Waves | 0.08234816 |
| 6 | Channel 5 - Channel 10 b Waves | 0.05446421 |
| 7 | Channel 6 - Channel 9 a Waves | 0.02834574 |
| 8 | Channel 3 b/a | 0.02729305 |
| 9 | Channel 5 - Channel 10 a Waves | 0.01966291 |
| 10 | Channel 2 - Channel 13 b Waves | 0.01822163 |
| 11 | Channel 4 - Channel 11 b/a | 0.01514397 |
| 12 | Channel 4 b/a | 0.01506173 |
| 13 | Channel 3 - Channel 12 b/a | 0.0149665 |
| 14 | Channel 4 - Channel 11 b Waves | 0.01246698 |
| 15 | Channel 1 - Channel 14 b Waves | 0.01196623 |

Table 5.3.55: Subject 4 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.14691608 |
| 2 | Channel 3 - Channel 12 b Waves | 0.09549319 |
| 3 | Pupil Average Diameter | 0.09259992 |
| 4 | Channel 3 - Channel 12 a Waves | 0.08736557 |
| 5 | Channel 6 - Channel 9 b Waves | 0.07154637 |
| 6 | Channel 5 - Channel 10 b Waves | 0.05479114 |
| 7 | Channel 5 - Channel 10 a Waves | 0.02790929 |
| 8 | Channel 6 - Channel 9 a Waves | 0.0242948 |
| 9 | Channel 2 - Channel 13 b Waves | 0.02390093 |
| 10 | Channel 3 b/a | 0.02290107 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02166377 |
| 12 | Channel 1 - Channel 14 b Waves | 0.01587143 |
| 13 | Channel 5 b/a | 0.01529226 |
| 14 | Channel 1 - Channel 14 b/a | 0.0148568 |
| 15 | Channel 1 b/a | 0.01392844 |

Table 5.3.56: Subject 4 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.16968574 |
| 2 | Channel 3 - Channel 12 b Waves | 0.08491863 |
| 3 | Channel 6 - Channel 9 b Waves | 0.08374861 |
| 4 | Channel 3 - Channel 12 a Waves | 0.08262523 |
| 5 | Channel 5 - Channel 10 b Waves | 0.06446047 |
| 6 | Pupil Average Diameter | 0.05761564 |
| 7 | Channel 3 b/a | 0.02304366 |
| 8 | Channel 6 - Channel 9 a Waves | 0.02276392 |
| 9 | Channel 5 - Channel 10 a Waves | 0.02157101 |
| 10 | Channel 2 - Channel 13 b Waves | 0.0205768 |
| 11 | Channel 4 - Channel 11 b/a | 0.01670305 |
| 12 | Channel 4 - Channel 11 b Waves | 0.01644045 |
| 13 | Channel 5 b/a | 0.01639308 |
| 14 | Channel 10 b/a | 0.01579033 |
| 15 | Channel 1 b/a | 0.01572001 |

Table 5.3.57: Subject 5 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.15071005 |
| 2 | Channel 3 - Channel 12 a Waves | 0.11370855 |
| 3 | Pupil Average Diameter | 0.07542582 |
| 4 | Channel 12 b/a | 0.05487996 |
| 5 | Change in R-R Interval | 0.053992 |
| 6 | Channel 2 - Channel 13 b Waves | 0.05360141 |
| 7 | Channel 2 - Channel 13 a Waves | 0.05114469 |
| 8 | Channel 5 b/a | 0.02894905 |
| 9 | Channel 3 - Channel 12 b/a | 0.02782082 |
| 10 | Channel 5 - Channel 10 b/a | 0.02369909 |
| 11 | Channel 7 - Channel 8 b Waves | 0.02322613 |
| 12 | Channel 5 - Channel 10 b Waves | 0.02316999 |
| 13 | Channel 4 - Channel 11 b Waves | 0.01865524 |
| 14 | Channel 5 - Channel 10 a Waves | 0.01739003 |
| 15 | Channel 7 - Channel 8 a Waves | 0.01609615 |

Table 5.3.58: Subject 5 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.15932527 |
| 2 | Channel 3 - Channel 12 a Waves | 0.11295764 |
| 3 | Pupil Average Diameter | 0.07246213 |
| 4 | Change in R-R Interval | 0.06149267 |
| 5 | Channel 12 b/a | 0.05873954 |
| 6 | Channel 2 - Channel 13 a Waves | 0.05024644 |
| 7 | Channel 2 - Channel 13 b Waves | 0.04372923 |
| 8 | Channel 3 - Channel 12 b/a | 0.02885886 |
| 9 | Channel 5 b/a | 0.02656205 |
| 10 | Channel 7 - Channel 8 b Waves | 0.0261781 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02315993 |
| 12 | Channel 5 - Channel 10 b Waves | 0.02175809 |
| 13 | Channel 5 - Channel 10 b/a | 0.02107061 |
| 14 | Channel 7 - Channel 8 a Waves | 0.01941907 |
| 15 | Channel 5 - Channel 10 a Waves | 0.01833091 |

Table 5.3.59: Subject 5 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.11706426 |
| 2 | Pupil Average Diameter | 0.10708515 |
| 3 | Change in R-R Interval | 0.09667614 |
| 4 | Channel 3 - Channel 12 a Waves | 0.05925229 |
| 5 | Channel 12 b/a | 0.05910978 |
| 6 | Channel 2 - Channel 13 a Waves | 0.04849223 |
| 7 | Channel 2 - Channel 13 b Waves | 0.04467473 |
| 8 | Channel 3 - Channel 12 b/a | 0.03018296 |
| 9 | Channel 7 - Channel 8 b Waves | 0.0279142 |
| 10 | Channel 7 - Channel 8 a Waves | 0.02475403 |
| 11 | Channel 5 b/a | 0.02246139 |
| 12 | Channel 5 - Channel 10 a Waves | 0.02134914 |
| 13 | Channel 4 - Channel 11 b Waves | 0.02093749 |
| 14 | Channel 5 - Channel 10 b Waves | 0.02091544 |
| 15 | Channel 5 - Channel 10 b/a | 0.01603151 |

Table 5.3.60: Subject 5 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.16704431 |
| 2 | Channel 3 - Channel 12 a Waves | 0.10053075 |
| 3 | Pupil Average Diameter | 0.06108758 |
| 4 | Change in R-R Interval | 0.05839286 |
| 5 | Channel 12 b/a | 0.0447788 |
| 6 | Channel 2 - Channel 13 b Waves | 0.03443303 |
| 7 | Channel 2 - Channel 13 a Waves | 0.03088966 |
| 8 | Channel 5 b/a | 0.02982194 |
| 9 | Channel 7 - Channel 8 b Waves | 0.02557594 |
| 10 | Channel 5 - Channel 10 b/a | 0.0230429 |
| 11 | Channel 4 - Channel 11 a Waves | 0.02289748 |
| 12 | Channel 3 - Channel 12 b/a | 0.02263056 |
| 13 | Channel 4 - Channel 11 b Waves | 0.02240612 |
| 14 | Channel 4 - Channel 11 b/a | 0.01968754 |
| 15 | Channel 1 - Channel 14 b Waves | 0.01941083 |

Table 5.3.61: Subject 5 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 a Waves | 0.13767352 |
| 2 | Channel 3 - Channel 12 b Waves | 0.12204084 |
| 3 | Change in R-R Interval | 0.06398821 |
| 4 | Channel 2 - Channel 13 a Waves | 0.0607635 |
| 5 | Channel 2 - Channel 13 b Waves | 0.05735601 |
| 6 | Pupil Average Diameter | 0.03434261 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03337074 |
| 8 | Channel 5 - Channel 10 b/a | 0.02320962 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02311165 |
| 10 | Channel 7 - Channel 8 a Waves | 0.02269328 |
| 11 | Channel 5 - Channel 10 a Waves | 0.02239236 |
| 12 | Channel 1 - Channel 14 b Waves | 0.02203323 |
| 13 | Channel 4 - Channel 11 a Waves | 0.02185391 |
| 14 | Channel 5 b/a | 0.02129605 |
| 15 | Channel 5 - Channel 10 b Waves | 0.02114314 |

Table 5.3.62: Subject 5 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.1436072 |
| 2 | Channel 3 - Channel 12 a Waves | 0.09645579 |
| 3 | Pupil Average Diameter | 0.07816891 |
| 4 | Change in R-R Interval | 0.06282251 |
| 5 | Channel 2 - Channel 13 a Waves | 0.04819174 |
| 6 | Channel 12 b/a | 0.04068889 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03739767 |
| 8 | Channel 5 b/a | 0.03414715 |
| 9 | Channel 3 - Channel 12 b/a | 0.02540945 |
| 10 | Channel 5 - Channel 10 b Waves | 0.0251613 |
| 11 | Channel 5 - Channel 10 b/a | 0.02451343 |
| 12 | Channel 7 - Channel 8 b Waves | 0.0244968 |
| 13 | Channel 4 - Channel 11 b Waves | 0.02110856 |
| 14 | Channel 5 - Channel 10 a Waves | 0.01928616 |
| 15 | Channel 7 - Channel 8 a Waves | 0.01847443 |

Table 5.3.63: Subject 5 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.14988736 |
| 2 | Channel 3 - Channel 12 a Waves | 0.09722991 |
| 3 | Pupil Average Diameter | 0.09092666 |
| 4 | Channel 12 b/a | 0.06006605 |
| 5 | Change in R-R Interval | 0.03802856 |
| 6 | Channel 5 b/a | 0.03565634 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03509031 |
| 8 | Channel 3 - Channel 12 b/a | 0.03277339 |
| 9 | Channel 2 - Channel 13 a Waves | 0.02833178 |
| 10 | Channel 5 - Channel 10 b/a | 0.02741411 |
| 11 | Channel 5 - Channel 10 b Waves | 0.02596915 |
| 12 | Channel 4 - Channel 11 b/a | 0.02214238 |
| 13 | Channel 4 b/a | 0.02063822 |
| 14 | Channel 5 - Channel 10 a Waves | 0.01947575 |
| 15 | Channel 7 - Channel 8 b Waves | 0.01818284 |

Table 5.3.64: Subject 5 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.19021215 |
| 2 | Channel 3 - Channel 12 a Waves | 0.15529444 |
| 3 | Pupil Average Diameter | 0.07311739 |
| 4 | Change in R-R Interval | 0.07178056 |
| 5 | Channel 12 b/a | 0.04018519 |
| 6 | Channel 2 - Channel 13 b Waves | 0.03439354 |
| 7 | Channel 2 - Channel 13 a Waves | 0.03104173 |
| 8 | Channel 5 b/a | 0.02755055 |
| 9 | Channel 3 - Channel 12 b/a | 0.02441499 |
| 10 | Channel 5 - Channel 10 b/a | 0.0215186 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02123703 |
| 12 | Channel 6 - Channel 9 b Waves | 0.01814578 |
| 13 | Channel 5 - Channel 10 a Waves | 0.01757671 |
| 14 | Channel 4 - Channel 11 b/a | 0.01735159 |
| 15 | Channel 7 - Channel 8 b Waves | 0.01672175 |

Table 5.3.65: Subject 5 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.22346895 |
| 2 | Channel 3 - Channel 12 a Waves | 0.20984552 |
| 3 | Change in R-R Interval | 0.0590802 |
| 4 | Channel 2 - Channel 13 a Waves | 0.04587794 |
| 5 | Pupil Average Diameter | 0.03998868 |
| 6 | Channel 2 - Channel 13 b Waves | 0.03623347 |
| 7 | Channel 12 b/a | 0.02548023 |
| 8 | Channel 7 - Channel 8 b Waves | 0.0232203 |
| 9 | Channel 5 b/a | 0.02162338 |
| 10 | Channel 3 - Channel 12 b/a | 0.02070442 |
| 11 | Channel 7 - Channel 8 a Waves | 0.02062493 |
| 12 | Channel 5 - Channel 10 b Waves | 0.01749507 |
| 13 | Channel 4 - Channel 11 b Waves | 0.01628592 |
| 14 | Channel 5 - Channel 10 a Waves | 0.01393662 |
| 15 | Channel 5 - Channel 10 b/a | 0.01351236 |

Table 5.3.66: Subject 5 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.16587268 |
| 2 | Channel 3 - Channel 12 a Waves | 0.14608194 |
| 3 | Channel 2 - Channel 13 b Waves | 0.06031507 |
| 4 | Change in R-R Interval | 0.05909693 |
| 5 | Channel 2 - Channel 13 a Waves | 0.04939587 |
| 6 | Channel 5 b/a | 0.04572795 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03501388 |
| 8 | Pupil Average Diameter | 0.03218849 |
| 9 | Channel 5 - Channel 10 b/a | 0.02756772 |
| 10 | Channel 5 - Channel 10 b Waves | 0.0224889 |
| 11 | Channel 7 - Channel 8 a Waves | 0.02087925 |
| 12 | Channel 4 - Channel 11 b Waves | 0.01835882 |
| 13 | Channel 12 b/a | 0.01760724 |
| 14 | Channel 4 - Channel 11 b/a | 0.01710618 |
| 15 | Channel 2 b/a | 0.01594208 |

Table 5.3.67: Subject 5 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.14988736 |
| 2 | Channel 3 - Channel 12 a Waves | 0.09722991 |
| 3 | Pupil Average Diameter | 0.09092666 |
| 4 | Channel 12 b/a | 0.06006605 |
| 5 | Change in R-R Interval | 0.03802856 |
| 6 | Channel 5 b/a | 0.03565634 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03509031 |
| 8 | Channel 3 - Channel 12 b/a | 0.03277339 |
| 9 | Channel 2 - Channel 13 a Waves | 0.02833178 |
| 10 | Channel 5 - Channel 10 b/a | 0.02741411 |
| 11 | Channel 5 - Channel 10 b Waves | 0.02596915 |
| 12 | Channel 4 - Channel 11 b/a | 0.02214238 |
| 13 | Channel 4 b/a | 0.02063822 |
| 14 | Channel 5 - Channel 10 a Waves | 0.01947575 |
| 15 | Channel 7 - Channel 8 b Waves | 0.01818284 |

Table 5.3.68: Subject 5 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 a Waves | 0.20964756 |
| 2 | Channel 3 - Channel 12 b Waves | 0.20936277 |
| 3 | Channel 2 - Channel 13 b Waves | 0.04965608 |
| 4 | Change in R-R Interval | 0.04859597 |
| 5 | Channel 2 - Channel 13 a Waves | 0.04653771 |
| 6 | Pupil Average Diameter | 0.03865593 |
| 7 | Channel 7 - Channel 8 b Waves | 0.02790844 |
| 8 | Channel 12 b/a | 0.02312935 |
| 9 | Channel 5 - Channel 10 b Waves | 0.02073454 |
| 10 | Channel 5 b/a | 0.0191287 |
| 11 | Channel 4 - Channel 11 b Waves | 0.01823088 |
| 12 | Channel 7 - Channel 8 a Waves | 0.01749361 |
| 13 | Channel 6 - Channel 9 b Waves | 0.0166895 |
| 14 | Channel 3 - Channel 12 b/a | 0.01580654 |
| 15 | Channel 5 - Channel 10 b/a | 0.01512147 |

Table 5.3.69: Subject 5 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.1118177 |
| 2 | Change in R-R Interval | 0.08172711 |
| 3 | Channel 3 - Channel 12 a Waves | 0.0816529 |
| 4 | Pupil Average Diameter | 0.05205117 |
| 5 | Channel 5 b/a | 0.03341058 |
| 6 | Channel 7 - Channel 8 a Waves | 0.03136527 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03071731 |
| 8 | Channel 2 - Channel 13 b Waves | 0.02980073 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02772458 |
| 10 | Channel 1 - Channel 14 b Waves | 0.02676829 |
| 11 | Channel 5 - Channel 10 b/a | 0.02523778 |
| 12 | Right Eye Euclidean Distance | 0.02234586 |
| 13 | Channel 1 - Channel 14 a Waves | 0.02229753 |
| 14 | Channel 5 - Channel 10 a Waves | 0.02204966 |
| 15 | Channel 4 - Channel 11 a Waves | 0.02131758 |

Table 5.3.70: Subject 6 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.11034596 |
| 2 | Channel 7 - Channel 8 b Waves | 0.10308851 |
| 3 | Channel 5 - Channel 10 a Waves | 0.05190434 |
| 4 | Change in R-R Interval | 0.04907161 |
| 5 | Channel 2 - Channel 13 b Waves | 0.04868304 |
| 6 | Channel 7 - Channel 8 a Waves | 0.04844763 |
| 7 | Channel 5 - Channel 10 b Waves | 0.03672931 |
| 8 | Channel 4 - Channel 11 b Waves | 0.02945895 |
| 9 | Channel 2 - Channel 13 b/a | 0.02561737 |
| 10 | Channel 13 b/a | 0.02546142 |
| 11 | Channel 3 - Channel 12 b Waves | 0.0241514 |
| 12 | Channel 5 b/a | 0.02265668 |
| 13 | Channel 2 b/a | 0.02211462 |
| 14 | Channel 6 - Channel 9 b Waves | 0.02139183 |
| 15 | Channel 3 - Channel 12 a Waves | 0.01994691 |

Table 5.3.71: Subject 6 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.11493195 |
| 2 | Channel 7 - Channel 8 b Waves | 0.07320579 |
| 3 | Change in R-R Interval | 0.06537675 |
| 4 | Channel 2 - Channel 13 b Waves | 0.05565096 |
| 5 | Channel 7 - Channel 8 a Waves | 0.04347614 |
| 6 | Channel 5 - Channel 10 a Waves | 0.03934454 |
| 7 | Channel 5 - Channel 10 b Waves | 0.03335196 |
| 8 | Channel 4 - Channel 11 b Waves | 0.0291382 |
| 9 | Channel 2 - Channel 13 b/a | 0.02755962 |
| 10 | Channel 13 b/a | 0.02684147 |
| 11 | Channel 2 b/a | 0.02445715 |
| 12 | Channel 3 - Channel 12 b Waves | 0.02243862 |
| 13 | Channel 1 - Channel 14 b Waves | 0.02171921 |
| 14 | Channel 2 - Channel 13 a Waves | 0.02118995 |
| 15 | Channel 6 - Channel 9 b Waves | 0.02088617 |

Table 5.3.72: Subject 6 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.17449323 |
| 2 | Channel 7 - Channel 8 b Waves | 0.09240071 |
| 3 | Channel 7 - Channel 8 a Waves | 0.05153319 |
| 4 | Change in R-R Interval | 0.04968053 |
| 5 | Channel 5 - Channel 10 a Waves | 0.03526323 |
| 6 | Channel 2 - Channel 13 b Waves | 0.03226543 |
| 7 | Channel 2 b/a | 0.02906327 |
| 8 | Channel 2 - Channel 13 b/a | 0.02777021 |
| 9 | Channel 5 - Channel 10 b Waves | 0.02552508 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02376796 |
| 11 | Channel 11 b/a | 0.02011076 |
| 12 | Channel 4 - Channel 11 b/a | 0.01997249 |
| 13 | Channel 4 - Channel 11 a Waves | 0.01972339 |
| 14 | Channel 1 - Channel 14 b Waves | 0.01926079 |
| 15 | Channel 13 b/a | 0.01917897 |

Table 5.3.73: Subject 6 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.14076572 |
| 2 | Channel 7 - Channel 8 b Waves | 0.13734164 |
| 3 | Change in R-R Interval | 0.0618156 |
| 4 | Channel 7 - Channel 8 a Waves | 0.05642915 |
| 5 | Channel 5 - Channel 10 a Waves | 0.04360881 |
| 6 | Channel 5 - Channel 10 b Waves | 0.03404326 |
| 7 | Channel 2 - Channel 13 b Waves | 0.02922196 |
| 8 | Channel 2 - Channel 13 b/a | 0.02227867 |
| 9 | Channel 11 b/a | 0.02071257 |
| 10 | Channel 5 b/a | 0.02031732 |
| 11 | Channel 13 b/a | 0.0200909 |
| 12 | Channel 6 - Channel 9 a Waves | 0.01928153 |
| 13 | Channel 2 b/a | 0.01889467 |
| 14 | Channel 4 - Channel 11 b Waves | 0.01882369 |
| 15 | Channel 1 - Channel 14 b Waves | 0.01870248 |

Table 5.3.74: Subject 6 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.14050279 |
| 2 | Pupil Average Diameter | 0.13070866 |
| 3 | Channel 7 - Channel 8 a Waves | 0.06541043 |
| 4 | Channel 5 - Channel 10 a Waves | 0.04954629 |
| 5 | Channel 2 - Channel 13 b Waves | 0.04637811 |
| 6 | Change in R-R Interval | 0.04542542 |
| 7 | Channel 5 - Channel 10 b Waves | 0.03585358 |
| 8 | Channel 13 b/a | 0.02156159 |
| 9 | Channel 2 - Channel 13 b/a | 0.02074853 |
| 10 | Channel 5 b/a | 0.02065053 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02052367 |
| 12 | Channel 6 - Channel 9 b Waves | 0.01931496 |
| 13 | Channel 3 - Channel 12 b Waves | 0.01848249 |
| 14 | Channel 1 - Channel 14 b Waves | 0.01787976 |
| 15 | Channel 2 b/a | 0.0171776 |

Table 5.3.75: Subject 6 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.15092068 |
| 2 | Channel 7 - Channel 8 b Waves | 0.11613088 |
| 3 | Change in R-R Interval | 0.06643352 |
| 4 | Channel 7 - Channel 8 a Waves | 0.05083364 |
| 5 | Channel 5 - Channel 10 a Waves | 0.04565069 |
| 6 | Channel 2 - Channel 13 b Waves | 0.03051922 |
| 7 | Channel 5 - Channel 10 b Waves | 0.03049014 |
| 8 | Channel 3 - Channel 12 b Waves | 0.02433966 |
| 9 | Channel 2 - Channel 13 b/a | 0.0238596 |
| 10 | Channel 4 - Channel 11 b/a | 0.02308371 |
| 11 | Channel 11 b/a | 0.02171162 |
| 12 | Channel 13 b/a | 0.02044683 |
| 13 | Channel 2 b/a | 0.02026407 |
| 14 | Channel 4 - Channel 11 b Waves | 0.02018027 |
| 15 | Channel 6 - Channel 9 b Waves | 0.01979568 |

Table 5.3.76: Subject 6 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.14342234 |
| 2 | Change in R-R Interval | 0.07992806 |
| 3 | Channel 2 - Channel 13 b Waves | 0.06031261 |
| 4 | Channel 7 - Channel 8 b Waves | 0.06020735 |
| 5 | Channel 7 - Channel 8 a Waves | 0.03481678 |
| 6 | Channel 4 - Channel 11 b Waves | 0.03445505 |
| 7 | Channel 5 - Channel 10 a Waves | 0.03437573 |
| 8 | Channel 13 b/a | 0.03265395 |
| 9 | Channel 2 - Channel 13 a Waves | 0.02794361 |
| 10 | Channel 2 - Channel 13 b/a | 0.0277922 |
| 11 | Channel 5 - Channel 10 b Waves | 0.02549125 |
| 12 | Channel 1 - Channel 14 b Waves | 0.02373213 |
| 13 | Channel 2 b/a | 0.02207101 |
| 14 | Channel 3 - Channel 12 b Waves | 0.02200299 |
| 15 | Channel 11 b/a | 0.01955307 |

Table 5.3.77: Subject 6 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.12782701 |
| 2 | Channel 7 - Channel 8 b Waves | 0.07320708 |
| 3 | Channel 2 - Channel 13 b Waves | 0.05817735 |
| 4 | Channel 5 - Channel 10 a Waves | 0.05717698 |
| 5 | Change in R-R Interval | 0.05471986 |
| 6 | Channel 7 - Channel 8 a Waves | 0.04728995 |
| 7 | Channel 5 - Channel 10 b Waves | 0.03540579 |
| 8 | Channel 4 - Channel 11 b Waves | 0.0291021 |
| 9 | Channel 2 b/a | 0.02837567 |
| 10 | Channel 2 - Channel 13 b/a | 0.02729273 |
| 11 | Channel 3 - Channel 12 b Waves | 0.02541975 |
| 12 | Channel 13 b/a | 0.02510259 |
| 13 | Channel 5 b/a | 0.02471895 |
| 14 | Channel 3 - Channel 12 a Waves | 0.02060557 |
| 15 | Channel 1 - Channel 14 b Waves | 0.01945347 |

Table 5.3.78: Subject 6 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.09438577 |
| 2 | Change in R-R Interval | 0.06891012 |
| 3 | Channel 7 - Channel 8 b Waves | 0.06570952 |
| 4 | Channel 2 - Channel 13 b Waves | 0.06430897 |
| 5 | Channel 5 - Channel 10 a Waves | 0.05241793 |
| 6 | Channel 5 - Channel 10 b Waves | 0.03808226 |
| 7 | Channel 7 - Channel 8 a Waves | 0.03259993 |
| 8 | Channel 4 - Channel 11 b Waves | 0.02891427 |
| 9 | Channel 13 b/a | 0.02678295 |
| 10 | Channel 1 - Channel 14 b Waves | 0.02492819 |
| 11 | Channel 3 - Channel 12 b Waves | 0.02344967 |
| 12 | Channel 5 b/a | 0.02333977 |
| 13 | Channel 6 - Channel 9 b Waves | 0.02024386 |
| 14 | Left Eye Euclidean Distance | 0.02020836 |
| 15 | Right Eye Euclidean Distance | 0.02019098 |

Table 5.3.79: Subject 6 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.13073629 |
| 2 | Pupil Average Diameter | 0.11167147 |
| 3 | Change in R-R Interval | 0.05497188 |
| 4 | Channel 7 - Channel 8 a Waves | 0.05340364 |
| 5 | Channel 2 - Channel 13 b Waves | 0.04652564 |
| 6 | Channel 5 - Channel 10 a Waves | 0.03897492 |
| 7 | Channel 4 - Channel 11 b Waves | 0.02945989 |
| 8 | Channel 3 - Channel 12 b Waves | 0.02860724 |
| 9 | Channel 5 - Channel 10 b Waves | 0.02843793 |
| 10 | Channel 13 b/a | 0.02595137 |
| 11 | Channel 2 - Channel 13 b/a | 0.02400563 |
| 12 | Channel 2 - Channel 13 a Waves | 0.02009082 |
| 13 | Channel 11 b/a | 0.01994836 |
| 14 | Channel 3 - Channel 12 a Waves | 0.0196533 |
| 15 | Channel 1 - Channel 14 b Waves | 0.01854185 |

Table 5.3.80: Subject 6 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.11742299 |
| 2 | Pupil Average Diameter | 0.09172091 |
| 3 | Channel 5 - Channel 10 a Waves | 0.0744042 |
| 4 | Channel 7 - Channel 8 a Waves | 0.06018706 |
| 5 | Channel 5 - Channel 10 b Waves | 0.04916097 |
| 6 | Channel 2 - Channel 13 b/a | 0.03634499 |
| 7 | Channel 2 b/a | 0.03514218 |
| 8 | Change in R-R Interval | 0.0329358 |
| 9 | Channel 3 - Channel 12 a Waves | 0.0262541 |
| 10 | Channel 3 - Channel 12 b Waves | 0.02580597 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02252487 |
| 12 | Channel 13 b/a | 0.02199896 |
| 13 | Channel 10 b/a | 0.02192684 |
| 14 | Channel 2 - Channel 13 b Waves | 0.02072279 |
| 15 | Channel 5 b/a | 0.01984411 |

Table 5.3.81: Subject 6 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.16252288 |
| 2 | Change in R-R Interval | 0.07721512 |
| 3 | Channel 7 - Channel 8 b Waves | 0.0586654 |
| 4 | Channel 2 - Channel 13 b Waves | 0.05599213 |
| 5 | Channel 7 - Channel 8 a Waves | 0.03744983 |
| 6 | Channel 5 - Channel 10 a Waves | 0.03473907 |
| 7 | Channel 4 - Channel 11 b Waves | 0.03266881 |
| 8 | Channel 3 - Channel 12 b Waves | 0.02808988 |
| 9 | Channel 5 - Channel 10 b Waves | 0.02567502 |
| 10 | Channel 13 b/a | 0.02477652 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02247858 |
| 12 | Channel 1 - Channel 14 b Waves | 0.02194158 |
| 13 | Channel 2 - Channel 13 b/a | 0.02042309 |
| 14 | Channel 2 b/a | 0.01999364 |
| 15 | Channel 3 - Channel 12 a Waves | 0.01970253 |

Table 5.3.82: Subject 6 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.11231515 |
| 2 | Pupil Average Diameter | 0.09947366 |
| 3 | Change in R-R Interval | 0.07993287 |
| 4 | Channel 7 - Channel 8 a Waves | 0.0464575 |
| 5 | Channel 2 - Channel 13 b Waves | 0.03941553 |
| 6 | Channel 5 - Channel 10 a Waves | 0.03656639 |
| 7 | Channel 5 - Channel 10 b Waves | 0.034377 |
| 8 | Channel 11 b/a | 0.02348964 |
| 9 | Channel 13 b/a | 0.02335137 |
| 10 | Channel 2 - Channel 13 a Waves | 0.02300027 |
| 11 | Channel 3 - Channel 12 b Waves | 0.02249167 |
| 12 | Channel 4 - Channel 11 b/a | 0.02173517 |
| 13 | Channel 4 - Channel 11 b Waves | 0.02149353 |
| 14 | Channel 6 - Channel 9 b Waves | 0.02024957 |
| 15 | Channel 7 b/a | 0.02023334 |

Table 5.3.83: Subject 7 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.08435199 |
| 2 | Channel 4 - Channel 11 a Waves | 0.06180577 |
| 3 | Channel 1 - Channel 14 a Waves | 0.06144517 |
| 4 | Pupil Average Diameter | 0.05446076 |
| 5 | Channel 1 - Channel 14 b Waves | 0.05332966 |
| 6 | Change in R-R Interval | 0.04572614 |
| 7 | Channel 14 b/a | 0.03638038 |
| 8 | Channel 4 b/a | 0.03525986 |
| 9 | Channel 5 - Channel 10 b/a | 0.03118338 |
| 10 | Channel 5 b/a | 0.02972654 |
| 11 | Channel 6 - Channel 9 b Waves | 0.0279884 |
| 12 | Channel 4 - Channel 11 b/a | 0.02786834 |
| 13 | Channel 10 b/a | 0.02367872 |
| 14 | Channel 5 - Channel 10 b Waves | 0.02207287 |
| 15 | Channel 6 - Channel 9 a Waves | 0.02133142 |

Table 5.3.84: Subject 7 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.08463839 |
| 2 | Channel 4 - Channel 11 a Waves | 0.07243197 |
| 3 | Channel 1 - Channel 14 a Waves | 0.07131585 |
| 4 | Channel 1 - Channel 14 b Waves | 0.05123298 |
| 5 | Pupil Average Diameter | 0.04960625 |
| 6 | Change in R-R Interval | 0.04182014 |
| 7 | Channel 14 b/a | 0.03627646 |
| 8 | Channel 5 - Channel 10 b/a | 0.03292271 |
| 9 | Channel 4 b/a | 0.0310793 |
| 10 | Channel 10 b/a | 0.0266848 |
| 11 | Channel 5 b/a | 0.02666394 |
| 12 | Channel 6 - Channel 9 b Waves | 0.02530142 |
| 13 | Channel 5 - Channel 10 b Waves | 0.02363705 |
| 14 | Channel 4 - Channel 11 b/a | 0.02220479 |
| 15 | Channel 6 - Channel 9 a Waves | 0.02176911 |

Table 5.3.85: Subject 7 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.07531786 |
| 2 | Channel 4 - Channel 11 a Waves | 0.05318171 |
| 3 | Change in R-R Interval | 0.04467843 |
| 4 | Channel 14 b/a | 0.04371909 |
| 5 | Pupil Average Diameter | 0.04285087 |
| 6 | Channel 1 - Channel 14 a Waves | 0.04057839 |
| 7 | Channel 1 - Channel 14 b Waves | 0.03624614 |
| 8 | Channel 4 b/a | 0.0337547 |
| 9 | Channel 6 - Channel 9 b Waves | 0.03327735 |
| 10 | Channel 5 b/a | 0.02963229 |
| 11 | Channel 5 - Channel 10 b/a | 0.02786845 |
| 12 | Channel 4 - Channel 11 b/a | 0.02746758 |
| 13 | Channel 6 - Channel 9 a Waves | 0.02697573 |
| 14 | Channel 5 - Channel 10 b Waves | 0.02664535 |
| 15 | Channel 6 - Channel 9 b/a | 0.02506513 |

Table 5.3.86: Subject 7 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 1 - Channel 14 a Waves | 0.07734965 |
| 2 | Channel 4 - Channel 11 b Waves | 0.07619726 |
| 3 | Pupil Average Diameter | 0.05625122 |
| 4 | Channel 1 - Channel 14 b Waves | 0.05430294 |
| 5 | Channel 4 - Channel 11 a Waves | 0.04867346 |
| 6 | Change in R-R Interval | 0.04155092 |
| 7 | Channel 5 b/a | 0.03307076 |
| 8 | Channel 6 - Channel 9 b Waves | 0.02788073 |
| 9 | Channel 5 - Channel 10 b/a | 0.02761665 |
| 10 | Channel 5 - Channel 10 b Waves | 0.02686625 |
| 11 | Channel 5 - Channel 10 a Waves | 0.02456975 |
| 12 | Channel 4 - Channel 11 b/a | 0.02446637 |
| 13 | Channel 14 b/a | 0.0236268 |
| 14 | Channel 6 - Channel 9 a Waves | 0.02268974 |
| 15 | Channel 6 b/a | 0.02181126 |

Table 5.3.87: Subject 7 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 1 - Channel 14 a Waves | 0.08277939 |
| 2 | Channel 4 - Channel 11 b Waves | 0.0758847 |
| 3 | Channel 1 - Channel 14 b Waves | 0.06661556 |
| 4 | Channel 4 - Channel 11 a Waves | 0.05144701 |
| 5 | Pupil Average Diameter | 0.04992106 |
| 6 | Change in R-R Interval | 0.03876979 |
| 7 | Channel 5 - Channel 10 b Waves | 0.02945504 |
| 8 | Channel 5 b/a | 0.02907034 |
| 9 | Channel 5 - Channel 10 b/a | 0.02644297 |
| 10 | Channel 14 b/a | 0.02537043 |
| 11 | Channel 6 - Channel 9 b Waves | 0.024671 |
| 12 | Channel 5 - Channel 10 a Waves | 0.0242004 |
| 13 | Channel 6 - Channel 9 a Waves | 0.02402853 |
| 14 | Channel 4 - Channel 11 b/a | 0.02287277 |
| 15 | Channel 4 b/a | 0.02165488 |

Table 5.3.88: Subject 7 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 1 - Channel 14 a Waves | 0.10959303 |
| 2 | Channel 1 - Channel 14 b Waves | 0.09559752 |
| 3 | Channel 4 - Channel 11 a Waves | 0.06329552 |
| 4 | Change in R-R Interval | 0.04507909 |
| 5 | Channel 14 b/a | 0.04496788 |
| 6 | Pupil Average Diameter | 0.04286652 |
| 7 | Channel 4 - Channel 11 b Waves | 0.04218492 |
| 8 | Channel 6 - Channel 9 b Waves | 0.03386786 |
| 9 | Channel 10 b/a | 0.030182 |
| 10 | Channel 1 - Channel 14 b/a | 0.02936172 |
| 11 | Channel 5 - Channel 10 b Waves | 0.02896073 |
| 12 | Channel 4 b/a | 0.02894171 |
| 13 | Channel 5 - Channel 10 b/a | 0.02188956 |
| 14 | Channel 6 - Channel 9 a Waves | 0.01892196 |
| 15 | Channel 3 - Channel 12 b Waves | 0.01864755 |

Table 5.3.89: Subject 7 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Change in R-R Interval | 0.06847157 |
| 2 | Channel 14 b/a | 0.05803946 |
| 3 | Channel 4 - Channel 11 b Waves | 0.04906159 |
| 4 | Pupil Average Diameter | 0.0441565 |
| 5 | Channel 1 - Channel 14 a Waves | 0.04288211 |
| 6 | Channel 4 - Channel 11 a Waves | 0.04284162 |
| 7 | Channel 1 - Channel 14 b Waves | 0.03982216 |
| 8 | Channel 4 b/a | 0.039381 |
| 9 | Channel 4 - Channel 11 b/a | 0.02974616 |
| 10 | Channel 6 - Channel 9 b Waves | 0.02849273 |
| 11 | Channel 6 b/a | 0.02518498 |
| 12 | Channel 1 - Channel 14 b/a | 0.02394654 |
| 13 | Channel 3 - Channel 12 b Waves | 0.0228506 |
| 14 | Channel 5 - Channel 10 b Waves | 0.02216445 |
| 15 | Channel 2 - Channel 13 a Waves | 0.02171791 |

Table 5.3.90: Subject 7 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.08218779 |
| 2 | Channel 4 - Channel 11 a Waves | 0.07275524 |
| 3 | Channel 1 - Channel 14 a Waves | 0.06086179 |
| 4 | Change in R-R Interval | 0.04546282 |
| 5 | Channel 1 - Channel 14 b Waves | 0.04375583 |
| 6 | Pupil Average Diameter | 0.04160798 |
| 7 | Channel 5 b/a | 0.03403343 |
| 8 | Channel 5 - Channel 10 b/a | 0.02911462 |
| 9 | Channel 6 - Channel 9 b Waves | 0.02906972 |
| 10 | Channel 14 b/a | 0.02707367 |
| 11 | Channel 4 b/a | 0.02683244 |
| 12 | Channel 4 - Channel 11 b/a | 0.02562424 |
| 13 | Channel 6 - Channel 9 b/a | 0.02554889 |
| 14 | Channel 5 - Channel 10 b Waves | 0.02401131 |
| 15 | Channel 6 b/a | 0.02372528 |

Table 5.3.91: Subject 7 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.07160837 |
| 2 | Channel 4 - Channel 11 a Waves | 0.06412862 |
| 3 | Change in R-R Interval | 0.05873317 |
| 4 | Channel 5 - Channel 10 b/a | 0.05268171 |
| 5 | Channel 5 b/a | 0.0461984 |
| 6 | Pupil Average Diameter | 0.04477174 |
| 7 | Channel 1 - Channel 14 a Waves | 0.03974855 |
| 8 | Channel 1 - Channel 14 b Waves | 0.03797759 |
| 9 | Channel 4 b/a | 0.03210448 |
| 10 | Channel 4 - Channel 11 b/a | 0.02825624 |
| 11 | Channel 6 - Channel 9 b Waves | 0.02642751 |
| 12 | Channel 10 b/a | 0.02606677 |
| 13 | Channel 14 b/a | 0.02507494 |
| 14 | Channel 6 - Channel 9 b/a | 0.02465745 |
| 15 | Channel 5 - Channel 10 b Waves | 0.02430028 |

Table 5.3.92: Subject 7 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 a Waves | 0.08489785 |
| 2 | Channel 4 - Channel 11 b Waves | 0.08091846 |
| 3 | Channel 1 - Channel 14 a Waves | 0.05773096 |
| 4 | Pupil Average Diameter | 0.04413921 |
| 5 | Channel 1 - Channel 14 b Waves | 0.03903981 |
| 6 | Channel 5 b/a | 0.03387444 |
| 7 | Channel 14 b/a | 0.03199949 |
| 8 | Channel 5 - Channel 10 b/a | 0.03136574 |
| 9 | Change in R-R Interval | 0.02784945 |
| 10 | Channel 4 b/a | 0.02778784 |
| 11 | Channel 10 b/a | 0.02593435 |
| 12 | Channel 4 - Channel 11 b/a | 0.02557832 |
| 13 | Channel 6 - Channel 9 b/a | 0.0235305 |
| 14 | Channel 6 - Channel 9 b Waves | 0.02351719 |
| 15 | Channel 6 b/a | 0.02259634 |

Table 5.3.93: Subject 7 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.06755896 |
| 2 | Channel 4 - Channel 11 b Waves | 0.05328495 |
| 3 | Channel 1 - Channel 14 a Waves | 0.05299268 |
| 4 | Channel 1 - Channel 14 b Waves | 0.04394741 |
| 5 | Change in R-R Interval | 0.04331667 |
| 6 | Channel 5 - Channel 10 b/a | 0.04230636 |
| 7 | Channel 6 - Channel 9 b Waves | 0.03651067 |
| 8 | Channel 4 - Channel 11 a Waves | 0.03549482 |
| 9 | Channel 10 b/a | 0.03362599 |
| 10 | Channel 4 b/a | 0.02992023 |
| 11 | Channel 5 b/a | 0.02776113 |
| 12 | Channel 9 b/a | 0.02701397 |
| 13 | Channel 5 - Channel 10 b Waves | 0.02561354 |
| 14 | Channel 4 - Channel 11 b/a | 0.02420819 |
| 15 | Channel 14 b/a | 0.02405601 |

Table 5.3.94: Subject 7 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.08062122 |
| 2 | Channel 1 - Channel 14 a Waves | 0.08050717 |
| 3 | Channel 4 - Channel 11 b Waves | 0.06532284 |
| 4 | Channel 4 - Channel 11 a Waves | 0.06180694 |
| 5 | Channel 14 b/a | 0.05057717 |
| 6 | Channel 4 b/a | 0.04473119 |
| 7 | Change in R-R Interval | 0.04172619 |
| 8 | Channel 1 - Channel 14 b Waves | 0.0399966 |
| 9 | Channel 5 - Channel 10 b/a | 0.0389921 |
| 10 | Channel 4 - Channel 11 b/a | 0.02517429 |
| 11 | Channel 10 b/a | 0.02482064 |
| 12 | Channel 5 b/a | 0.02364621 |
| 13 | Channel 9 b/a | 0.02127894 |
| 14 | Channel 1 - Channel 14 b/a | 0.01994064 |
| 15 | Channel 6 - Channel 9 b Waves | 0.0188895 |

Table 5.3.95: Subject 7 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 1 - Channel 14 a Waves | 0.10440324 |
| 2 | Pupil Average Diameter | 0.09277959 |
| 3 | Channel 4 - Channel 11 a Waves | 0.08418672 |
| 4 | Channel 4 - Channel 11 b Waves | 0.08037726 |
| 5 | Channel 14 b/a | 0.05121173 |
| 6 | Channel 1 - Channel 14 b Waves | 0.04046905 |
| 7 | Channel 4 b/a | 0.03069592 |
| 8 | Change in R-R Interval | 0.02429232 |
| 9 | Channel 4 - Channel 11 b/a | 0.02214865 |
| 10 | Channel 1 - Channel 14 b/a | 0.01999184 |
| 11 | Channel 2 - Channel 13 b Waves | 0.01963432 |
| 12 | Channel 6 - Channel 9 b Waves | 0.01891636 |
| 13 | Channel 6 - Channel 9 a Waves | 0.01877496 |
| 14 | Channel 6 b/a | 0.01873509 |
| 15 | Channel 2 - Channel 13 a Waves | 0.01853985 |

Table 5.3.96: Subject 8 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.14116293 |
| 2 | Channel 4 - Channel 11 b Waves | 0.13475873 |
| 3 | Channel 5 - Channel 10 b Waves | 0.10247801 |
| 4 | Channel 6 - Channel 9 b Waves | 0.09817218 |
| 5 | Channel 2 - Channel 13 b Waves | 0.06912276 |
| 6 | Channel 4 - Channel 11 a Waves | 0.06070512 |
| 7 | Channel 1 - Channel 14 b Waves | 0.059087 |
| 8 | Channel 7 - Channel 8 b Waves | 0.0390613 |
| 9 | Pupil Average Diameter | 0.03609363 |
| 10 | Channel 5 - Channel 10 a Waves | 0.02200069 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02175782 |
| 12 | Channel 3 - Channel 12 a Waves | 0.01920588 |
| 13 | Channel 11 b/a | 0.01551584 |
| 14 | Change in R-R Interval | 0.01480928 |
| 15 | Channel 3 b/a | 0.01121098 |

Table 5.3.97: Subject 8 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.18198391 |
| 2 | Channel 5 - Channel 10 b Waves | 0.12874142 |
| 3 | Channel 3 - Channel 12 b Waves | 0.10633458 |
| 4 | Channel 4 - Channel 11 a Waves | 0.09051066 |
| 5 | Channel 6 - Channel 9 b Waves | 0.08365598 |
| 6 | Channel 1 - Channel 14 b Waves | 0.07008912 |
| 7 | Channel 2 - Channel 13 b Waves | 0.06319366 |
| 8 | Channel 2 - Channel 13 a Waves | 0.02699909 |
| 9 | Channel 3 - Channel 12 a Waves | 0.0217408 |
| 10 | Pupil Average Diameter | 0.01885785 |
| 11 | Channel 5 - Channel 10 a Waves | 0.01823698 |
| 12 | Channel 11 b/a | 0.01740039 |
| 13 | Change in R-R Interval | 0.01709607 |
| 14 | Channel 7 - Channel 8 b Waves | 0.01286669 |
| 15 | Channel 10 b/a | 0.01225419 |

Table 5.3.98: Subject 8 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.12924606 |
| 2 | Channel 5 - Channel 10 b Waves | 0.11749783 |
| 3 | Channel 4 - Channel 11 b Waves | 0.11115742 |
| 4 | Channel 6 - Channel 9 b Waves | 0.09278023 |
| 5 | Channel 2 - Channel 13 b Waves | 0.06224641 |
| 6 | Channel 4 - Channel 11 a Waves | 0.05651143 |
| 7 | Channel 1 - Channel 14 b Waves | 0.05499707 |
| 8 | Pupil Average Diameter | 0.05374313 |
| 9 | Channel 3 - Channel 12 a Waves | 0.03372056 |
| 10 | Channel 2 - Channel 13 a Waves | 0.0290697 |
| 11 | Channel 5 - Channel 10 a Waves | 0.02486317 |
| 12 | Change in R-R Interval | 0.02472614 |
| 13 | Channel 11 b/a | 0.01856313 |
| 14 | Channel 7 - Channel 8 b Waves | 0.01411551 |
| 15 | Channel 6 - Channel 9 a Waves | 0.0124246 |

Table 5.3.99: Subject 8 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.13673252 |
| 2 | Channel 2 - Channel 13 b Waves | 0.11521085 |
| 3 | Channel 3 - Channel 12 b Waves | 0.11468354 |
| 4 | Channel 4 - Channel 11 a Waves | 0.09428532 |
| 5 | Channel 6 - Channel 9 b Waves | 0.07210431 |
| 6 | Channel 7 - Channel 8 b Waves | 0.05700769 |
| 7 | Channel 5 - Channel 10 b Waves | 0.05677685 |
| 8 | Channel 2 - Channel 13 a Waves | 0.05308822 |
| 9 | Channel 1 - Channel 14 b Waves | 0.04244907 |
| 10 | Pupil Average Diameter | 0.02552576 |
| 11 | Channel 3 - Channel 12 a Waves | 0.02109644 |
| 12 | Change in R-R Interval | 0.0183438 |
| 13 | Channel 6 - Channel 9 a Waves | 0.01636812 |
| 14 | Channel 3 b/a | 0.0129577 |
| 15 | Channel 14 b/a | 0.01219955 |

Table 5.3.100: Subject 8 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.14206198 |
| 2 | Channel 6 - Channel 9 b Waves | 0.12877121 |
| 3 | Channel 3 - Channel 12 b Waves | 0.1183937 |
| 4 | Channel 5 - Channel 10 b Waves | 0.09507414 |
| 5 | Channel 7 - Channel 8 b Waves | 0.06591672 |
| 6 | Channel 2 - Channel 13 b Waves | 0.06231527 |
| 7 | Channel 1 - Channel 14 b Waves | 0.05448931 |
| 8 | Channel 4 - Channel 11 a Waves | 0.05352792 |
| 9 | Pupil Average Diameter | 0.03933747 |
| 10 | Channel 2 - Channel 13 a Waves | 0.02957983 |
| 11 | Channel 5 - Channel 10 a Waves | 0.02349483 |
| 12 | Channel 3 - Channel 12 a Waves | 0.01415337 |
| 13 | Change in R-R Interval | 0.01393632 |
| 14 | Channel 6 - Channel 9 a Waves | 0.0112744 |
| 15 | Channel 11 b/a | 0.01033175 |

Table 5.3.101: Subject 8 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.14197124 |
| 2 | Channel 3 - Channel 12 b Waves | 0.11465965 |
| 3 | Channel 4 - Channel 11 b Waves | 0.10521991 |
| 4 | Channel 1 - Channel 14 b Waves | 0.10237886 |
| 5 | Channel 2 - Channel 13 b Waves | 0.06996508 |
| 6 | Channel 7 - Channel 8 b Waves | 0.05472795 |
| 7 | Channel 6 - Channel 9 b Waves | 0.04373488 |
| 8 | Pupil Average Diameter | 0.04314783 |
| 9 | Channel 4 - Channel 11 a Waves | 0.03807437 |
| 10 | Channel 5 - Channel 10 a Waves | 0.02514702 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02393941 |
| 12 | Change in R-R Interval | 0.02161397 |
| 13 | Channel 11 b/a | 0.0181484 |
| 14 | Channel 14 b/a | 0.01540037 |
| 15 | Channel 3 - Channel 12 a Waves | 0.01285153 |

Table 5.3.102: Subject 8 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.10998834 |
| 2 | Channel 3 - Channel 12 b Waves | 0.10871554 |
| 3 | Channel 5 - Channel 10 b Waves | 0.10190341 |
| 4 | Pupil Average Diameter | 0.09794774 |
| 5 | Channel 2 - Channel 13 b Waves | 0.08236788 |
| 6 | Channel 6 - Channel 9 b Waves | 0.06701073 |
| 7 | Channel 1 - Channel 14 b Waves | 0.04396318 |
| 8 | Channel 4 - Channel 11 a Waves | 0.03736657 |
| 9 | Channel 11 b/a | 0.0370425 |
| 10 | Channel 7 - Channel 8 b Waves | 0.03329712 |
| 11 | Channel 3 - Channel 12 a Waves | 0.02751071 |
| 12 | Channel 2 - Channel 13 a Waves | 0.02621804 |
| 13 | Channel 5 - Channel 10 a Waves | 0.02040758 |
| 14 | Channel 3 b/a | 0.01743479 |
| 15 | Change in R-R Interval | 0.01436473 |

Table 5.3.103: Subject 8 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 4 - Channel 11 b Waves | 0.12825661 |
| 2 | Channel 3 - Channel 12 b Waves | 0.12753972 |
| 3 | Channel 6 - Channel 9 b Waves | 0.09783925 |
| 4 | Channel 2 - Channel 13 b Waves | 0.08386695 |
| 5 | Channel 5 - Channel 10 b Waves | 0.07118152 |
| 6 | Channel 4 - Channel 11 a Waves | 0.05452943 |
| 7 | Pupil Average Diameter | 0.04693868 |
| 8 | Channel 1 - Channel 14 b Waves | 0.04443756 |
| 9 | Channel 7 - Channel 8 b Waves | 0.04164363 |
| 10 | Channel 3 - Channel 12 a Waves | 0.0295346 |
| 11 | Channel 5 - Channel 10 a Waves | 0.02898772 |
| 12 | Channel 2 - Channel 13 a Waves | 0.02324244 |
| 13 | Channel 11 b/a | 0.01751741 |
| 14 | Channel 3 b/a | 0.01617633 |
| 15 | Change in R-R Interval | 0.01418767 |

Table 5.3.104: Subject 8 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 6 - Channel 9 b Waves | 0.12996035 |
| 2 | Channel 3 - Channel 12 b Waves | 0.11762006 |
| 3 | Channel 2 - Channel 13 b Waves | 0.10288334 |
| 4 | Channel 4 - Channel 11 b Waves | 0.09002907 |
| 5 | Channel 4 - Channel 11 a Waves | 0.06138287 |
| 6 | Channel 5 - Channel 10 b Waves | 0.0528752 |
| 7 | Channel 1 - Channel 14 b Waves | 0.05083998 |
| 8 | Channel 7 - Channel 8 b Waves | 0.04697112 |
| 9 | Channel 2 - Channel 13 a Waves | 0.04172041 |
| 10 | Pupil Average Diameter | 0.03440659 |
| 11 | Channel 3 - Channel 12 a Waves | 0.0216843 |
| 12 | Channel 3 b/a | 0.02050788 |
| 13 | Change in R-R Interval | 0.0166737 |
| 14 | Channel 5 - Channel 10 a Waves | 0.01579811 |
| 15 | Channel 9 b/a | 0.01530709 |

Table 5.3.105: Subject 8 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.12616196 |
| 2 | Channel 4 - Channel 11 b Waves | 0.12159723 |
| 3 | Channel 6 - Channel 9 b Waves | 0.09716652 |
| 4 | Channel 5 - Channel 10 b Waves | 0.08924999 |
| 5 | Channel 4 - Channel 11 a Waves | 0.08794541 |
| 6 | Channel 2 - Channel 13 b Waves | 0.08617459 |
| 7 | Channel 1 - Channel 14 b Waves | 0.06579694 |
| 8 | Channel 5 - Channel 10 a Waves | 0.03955989 |
| 9 | Channel 2 - Channel 13 a Waves | 0.03711086 |
| 10 | Change in R-R Interval | 0.02220741 |
| 11 | Channel 3 - Channel 12 a Waves | 0.01754452 |
| 12 | Channel 7 - Channel 8 b Waves | 0.01663003 |
| 13 | Channel 3 b/a | 0.0149446 |
| 14 | Pupil Average Diameter | 0.01401594 |
| 15 | Channel 10 b/a | 0.01278256 |

Table 5.3.106: Subject 8 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.14222355 |
| 2 | Channel 5 - Channel 10 b Waves | 0.10596701 |
| 3 | Channel 4 - Channel 11 b Waves | 0.09271582 |
| 4 | Channel 2 - Channel 13 b Waves | 0.08562873 |
| 5 | Channel 6 - Channel 9 b Waves | 0.08266791 |
| 6 | Pupil Average Diameter | 0.06276692 |
| 7 | Channel 1 - Channel 14 b Waves | 0.05989048 |
| 8 | Channel 4 - Channel 11 a Waves | 0.04053943 |
| 9 | Channel 7 - Channel 8 b Waves | 0.03917894 |
| 10 | Channel 3 - Channel 12 a Waves | 0.02307991 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02245803 |
| 12 | Channel 5 - Channel 10 a Waves | 0.01737884 |
| 13 | Channel 6 - Channel 9 a Waves | 0.01420278 |
| 14 | Channel 14 b/a | 0.01391143 |
| 15 | Change in R-R Interval | 0.01320926 |

Table 5.3.107: Subject 8 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.14338053 |
| 2 | Channel 4 - Channel 11 b Waves | 0.13256794 |
| 3 | Channel 3 - Channel 12 b Waves | 0.11106806 |
| 4 | Channel 1 - Channel 14 b Waves | 0.08316639 |
| 5 | Channel 6 - Channel 9 b Waves | 0.08234869 |
| 6 | Channel 2 - Channel 13 b Waves | 0.07442187 |
| 7 | Channel 4 - Channel 11 a Waves | 0.06357207 |
| 8 | Pupil Average Diameter | 0.03551144 |
| 9 | Channel 5 - Channel 10 a Waves | 0.02481399 |
| 10 | Channel 11 b/a | 0.02365664 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02312304 |
| 12 | Channel 7 - Channel 8 b Waves | 0.01897029 |
| 13 | Change in R-R Interval | 0.01884842 |
| 14 | Channel 3 - Channel 12 a Waves | 0.01429932 |
| 15 | Channel 3 b/a | 0.00951293 |

Table 5.3.108: Subject 8 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.16114253 |
| 2 | Channel 4 - Channel 11 b Waves | 0.13329329 |
| 3 | Channel 3 - Channel 12 b Waves | 0.11536002 |
| 4 | Channel 1 - Channel 14 b Waves | 0.11060442 |
| 5 | Channel 2 - Channel 13 b Waves | 0.07931832 |
| 6 | Channel 6 - Channel 9 b Waves | 0.05009006 |
| 7 | Channel 4 - Channel 11 a Waves | 0.04021596 |
| 8 | Channel 2 - Channel 13 a Waves | 0.03101263 |
| 9 | Channel 5 - Channel 10 a Waves | 0.0297719 |
| 10 | Change in R-R Interval | 0.02482526 |
| 11 | Channel 3 - Channel 12 a Waves | 0.01877228 |
| 12 | Channel 7 - Channel 8 b Waves | 0.01581981 |
| 13 | Pupil Average Diameter | 0.01500887 |
| 14 | Channel 12 b/a | 0.01488804 |
| 15 | Channel 1 - Channel 14 a Waves | 0.01307756 |

Table 5.3.109: Subject 9 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.10004412 |
| 2 | Channel 3 - Channel 12 b Waves | 0.05927607 |
| 3 | Channel 3 - Channel 12 a Waves | 0.05605086 |
| 4 | Change in R-R Interval | 0.04389571 |
| 5 | Channel 1 - Channel 14 b Waves | 0.03619896 |
| 6 | Channel 3 b/a | 0.03606917 |
| 7 | Channel 6 - Channel 9 b Waves | 0.03522629 |
| 8 | Channel 14 b/a | 0.03446624 |
| 9 | Channel 1 - Channel 14 b/a | 0.03234918 |
| 10 | Channel 5 - Channel 10 b Waves | 0.03025324 |
| 11 | Channel 6 - Channel 9 a Waves | 0.02912142 |
| 12 | Channel 1 b/a | 0.02779522 |
| 13 | Channel 3 - Channel 12 b/a | 0.0276791 |
| 14 | Channel 5 - Channel 10 a Waves | 0.0263879 |
| 15 | Channel 4 - Channel 11 a Waves | 0.02553773 |

Table 5.3.110: Subject 9 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.0653668 |
| 2 | Channel 3 - Channel 12 a Waves | 0.06323388 |
| 3 | Pupil Average Diameter | 0.05967158 |
| 4 | Channel 6 - Channel 9 b Waves | 0.04358008 |
| 5 | Change in R-R Interval | 0.04155539 |
| 6 | Channel 3 b/a | 0.03941029 |
| 7 | Channel 1 - Channel 14 b/a | 0.03597237 |
| 8 | Channel 14 b/a | 0.03538004 |
| 9 | Channel 6 - Channel 9 a Waves | 0.03409046 |
| 10 | Channel 1 b/a | 0.03241924 |
| 11 | Channel 5 - Channel 10 b Waves | 0.03003836 |
| 12 | Channel 1 - Channel 14 b Waves | 0.02978864 |
| 13 | Channel 4 - Channel 11 a Waves | 0.02863054 |
| 14 | Channel 3 - Channel 12 b/a | 0.02537622 |
| 15 | Channel 5 - Channel 10 a Waves | 0.02486063 |

Table 5.3.111: Subject 9 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.06952262 |
| 2 | Channel 6 - Channel 9 b Waves | 0.04508686 |
| 3 | Channel 3 - Channel 12 b Waves | 0.04359893 |
| 4 | Change in R-R Interval | 0.04131467 |
| 5 | Channel 1 - Channel 14 b Waves | 0.03820212 |
| 6 | Channel 6 - Channel 9 a Waves | 0.03534582 |
| 7 | Channel 3 - Channel 12 a Waves | 0.03390928 |
| 8 | Channel 5 - Channel 10 b Waves | 0.03007857 |
| 9 | Channel 1 b/a | 0.02765291 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02760579 |
| 11 | Channel 1 - Channel 14 b/a | 0.02728829 |
| 12 | Channel 5 - Channel 10 a Waves | 0.02617225 |
| 13 | Channel 14 b/a | 0.02564231 |
| 14 | Right Eye Euclidean Distance | 0.02558426 |
| 15 | Channel 4 - Channel 11 a Waves | 0.0253573 |

Table 5.3.112: Subject 9 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.14711977 |
| 2 | Channel 3 - Channel 12 b Waves | 0.04884203 |
| 3 | Change in R-R Interval | 0.04242804 |
| 4 | Channel 1 - Channel 14 b Waves | 0.04179794 |
| 5 | Channel 14 b/a | 0.03258451 |
| 6 | Channel 1 b/a | 0.03253541 |
| 7 | Channel 6 - Channel 9 b Waves | 0.03251126 |
| 8 | Channel 3 b/a | 0.03157307 |
| 9 | Channel 3 - Channel 12 a Waves | 0.03019211 |
| 10 | Channel 1 - Channel 14 b/a | 0.028805 |
| 11 | Channel 5 - Channel 10 b Waves | 0.02755107 |
| 12 | Channel 6 - Channel 9 a Waves | 0.02618657 |
| 13 | Channel 4 - Channel 11 b Waves | 0.02602569 |
| 14 | Channel 3 - Channel 12 b/a | 0.02403441 |
| 15 | Right Eye Euclidean Distance | 0.02356961 |

Table 5.3.113: Subject 9 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.13471862 |
| 2 | Channel 1 - Channel 14 b Waves | 0.04414787 |
| 3 | Channel 3 - Channel 12 b Waves | 0.0417831 |
| 4 | Change in R-R Interval | 0.03786793 |
| 5 | Channel 3 b/a | 0.03532233 |
| 6 | Channel 6 - Channel 9 b Waves | 0.03412259 |
| 7 | Channel 3 - Channel 12 a Waves | 0.03341244 |
| 8 | Channel 1 b/a | 0.0299231 |
| 9 | Channel 5 - Channel 10 b Waves | 0.02867112 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02839289 |
| 11 | Channel 1 - Channel 14 b/a | 0.02782319 |
| 12 | Channel 14 b/a | 0.02649975 |
| 13 | Right Eye Euclidean Distance | 0.02581044 |
| 14 | Channel 6 - Channel 9 a Waves | 0.02555539 |
| 15 | Channel 5 - Channel 10 a Waves | 0.02412706 |

Table 5.3.114: Subject 9 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.12696822 |
| 2 | Channel 1 - Channel 14 b Waves | 0.04410674 |
| 3 | Change in R-R Interval | 0.04310301 |
| 4 | Channel 6 - Channel 9 b Waves | 0.03837421 |
| 5 | Channel 3 - Channel 12 b Waves | 0.03733286 |
| 6 | Channel 5 - Channel 10 b Waves | 0.03532248 |
| 7 | Channel 3 - Channel 12 a Waves | 0.0352965 |
| 8 | Channel 3 b/a | 0.03196341 |
| 9 | Channel 14 b/a | 0.03028587 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02885911 |
| 11 | Channel 6 - Channel 9 a Waves | 0.02768877 |
| 12 | Channel 4 - Channel 11 a Waves | 0.02739417 |
| 13 | Channel 5 - Channel 10 a Waves | 0.02685187 |
| 14 | Channel 3 - Channel 12 b/a | 0.02474236 |
| 15 | Right Eye Euclidean Distance | 0.02352394 |

Table 5.3.115: Subject 9 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.11541359 |
| 2 | Channel 1 - Channel 14 b Waves | 0.05058046 |
| 3 | Change in R-R Interval | 0.03982428 |
| 4 | Channel 6 - Channel 9 b Waves | 0.03739006 |
| 5 | Channel 3 - Channel 12 b Waves | 0.03298728 |
| 6 | Channel 3 b/a | 0.0316944 |
| 7 | Channel 3 - Channel 12 a Waves | 0.03090551 |
| 8 | Channel 4 - Channel 11 a Waves | 0.03076279 |
| 9 | Channel 5 - Channel 10 b Waves | 0.03000431 |
| 10 | Channel 6 - Channel 9 a Waves | 0.02938954 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02839905 |
| 12 | Channel 5 - Channel 10 a Waves | 0.02787938 |
| 13 | Channel 14 b/a | 0.02714235 |
| 14 | Channel 1 - Channel 14 b/a | 0.0223795 |
| 15 | Right Eye Euclidean Distance | 0.02217095 |

Table 5.3.116: Subject 9 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.1789727 |
| 2 | Channel 3 - Channel 12 b Waves | 0.06277284 |
| 3 | Channel 3 - Channel 12 a Waves | 0.05413462 |
| 4 | Change in R-R Interval | 0.04393859 |
| 5 | Channel 3 b/a | 0.0402521 |
| 6 | Channel 6 - Channel 9 b Waves | 0.03607161 |
| 7 | Channel 14 b/a | 0.03565723 |
| 8 | Channel 3 - Channel 12 b/a | 0.03082708 |
| 9 | Channel 1 - Channel 14 b/a | 0.02994694 |
| 10 | Channel 1 - Channel 14 b Waves | 0.02593987 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02505264 |
| 12 | Channel 5 - Channel 10 b Waves | 0.02389322 |
| 13 | Channel 5 - Channel 10 a Waves | 0.02297687 |
| 14 | Channel 6 - Channel 9 a Waves | 0.02259222 |
| 15 | Channel 1 b/a | 0.02132978 |

Table 5.3.117: Subject 9 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.10590218 |
| 2 | Channel 3 - Channel 12 a Waves | 0.07294499 |
| 3 | Channel 6 - Channel 9 b Waves | 0.06062926 |
| 4 | Channel 3 - Channel 12 b Waves | 0.05618624 |
| 5 | Change in R-R Interval | 0.05094898 |
| 6 | Channel 3 b/a | 0.04930142 |
| 7 | Channel 6 - Channel 9 a Waves | 0.04459205 |
| 8 | Channel 4 - Channel 11 a Waves | 0.03298975 |
| 9 | Channel 3 - Channel 12 b/a | 0.03178195 |
| 10 | Channel 5 - Channel 10 b Waves | 0.03152798 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02982596 |
| 12 | Channel 5 - Channel 10 a Waves | 0.02832862 |
| 13 | Channel 1 - Channel 14 b Waves | 0.02300733 |
| 14 | Channel 14 b/a | 0.02238267 |
| 15 | Right Eye Euclidean Distance | 0.01995385 |

Table 5.3.118: Subject 9 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.07222286 |
| 2 | Channel 6 - Channel 9 b Waves | 0.06632225 |
| 3 | Channel 3 - Channel 12 a Waves | 0.05475145 |
| 4 | Channel 3 - Channel 12 b Waves | 0.0485696 |
| 5 | Channel 6 - Channel 9 a Waves | 0.0353175 |
| 6 | Channel 4 - Channel 11 a Waves | 0.03487511 |
| 7 | Channel 14 b/a | 0.03486916 |
| 8 | Change in R-R Interval | 0.03437874 |
| 9 | Channel 4 - Channel 11 b Waves | 0.0341254 |
| 10 | Channel 5 - Channel 10 b Waves | 0.03019092 |
| 11 | Channel 1 - Channel 14 b/a | 0.0280566 |
| 12 | Channel 3 b/a | 0.02722344 |
| 13 | Channel 1 - Channel 14 b Waves | 0.0251783 |
| 14 | Right Eye Euclidean Distance | 0.02498951 |
| 15 | Channel 5 - Channel 10 a Waves | 0.02489509 |

Table 5.3.119: Subject 9 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.1281743 |
| 2 | Channel 1 - Channel 14 b Waves | 0.05431912 |
| 3 | Change in R-R Interval | 0.05027321 |
| 4 | Channel 3 - Channel 12 a Waves | 0.03777901 |
| 5 | Channel 3 - Channel 12 b Waves | 0.03261443 |
| 6 | Channel 6 - Channel 9 b Waves | 0.0319465 |
| 7 | Channel 3 b/a | 0.03167019 |
| 8 | Channel 6 - Channel 9 a Waves | 0.02892642 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02729098 |
| 10 | Right Eye Euclidean Distance | 0.02573963 |
| 11 | Channel 3 - Channel 12 b/a | 0.02489543 |
| 12 | Channel 5 - Channel 10 a Waves | 0.02414768 |
| 13 | Channel 14 b/a | 0.02406191 |
| 14 | Left Eye Euclidean Distance | 0.02284384 |
| 15 | Channel 5 - Channel 10 b Waves | 0.02258352 |

Table 5.3.120: Subject 9 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.10545621 |
| 2 | Channel 3 b/a | 0.04267116 |
| 3 | Channel 3 - Channel 12 b Waves | 0.04093809 |
| 4 | Channel 3 - Channel 12 a Waves | 0.03898613 |
| 5 | Change in R-R Interval | 0.03848833 |
| 6 | Channel 1 - Channel 14 b Waves | 0.03794846 |
| 7 | Channel 6 - Channel 9 b Waves | 0.0357334 |
| 8 | Channel 3 - Channel 12 b/a | 0.02915391 |
| 9 | Channel 6 - Channel 9 a Waves | 0.02884046 |
| 10 | Channel 5 - Channel 10 b Waves | 0.02797504 |
| 11 | Channel 14 b/a | 0.02769406 |
| 12 | Channel 4 - Channel 11 b Waves | 0.02731255 |
| 13 | Right Eye Euclidean Distance | 0.02666759 |
| 14 | Channel 5 - Channel 10 a Waves | 0.02625047 |
| 15 | Left Eye Euclidean Distance | 0.02456501 |

Table 5.3.121: Subject 9 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.11541359 |
| 2 | Channel 1 - Channel 14 b Waves | 0.05058046 |
| 3 | Change in R-R Interval | 0.03982428 |
| 4 | Channel 6 - Channel 9 b Waves | 0.03739006 |
| 5 | Channel 3 - Channel 12 b Waves | 0.03298728 |
| 6 | Channel 3 b/a | 0.0316944 |
| 7 | Channel 3 - Channel 12 a Waves | 0.03090551 |
| 8 | Channel 4 - Channel 11 a Waves | 0.03076279 |
| 9 | Channel 5 - Channel 10 b Waves | 0.03000431 |
| 10 | Channel 6 - Channel 9 a Waves | 0.02938954 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02839905 |
| 12 | Channel 5 - Channel 10 a Waves | 0.02787938 |
| 13 | Channel 14 b/a | 0.02714235 |
| 14 | Channel 1 - Channel 14 b/a | 0.0223795 |
| 15 | Right Eye Euclidean Distance | 0.02217095 |

Table 5.3.122: Subject 10 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.1631258 |
| 2 | Channel 2 - Channel 13 b Waves | 0.15024972 |
| 3 | Channel 4 - Channel 11 b Waves | 0.1272094 |
| 4 | Channel 3 - Channel 12 b Waves | 0.11437891 |
| 5 | Channel 7 - Channel 8 b Waves | 0.10680544 |
| 6 | Channel 6 - Channel 9 b Waves | 0.04883161 |
| 7 | Channel 2 - Channel 13 a Waves | 0.04025167 |
| 8 | Channel 5 - Channel 10 a Waves | 0.03171416 |
| 9 | Channel 7 - Channel 8 a Waves | 0.02685043 |
| 10 | Channel 1 - Channel 14 b Waves | 0.02495264 |
| 11 | Channel 3 - Channel 12 a Waves | 0.0183478 |
| 12 | Pupil Average Diameter | 0.01635737 |
| 13 | Channel 6 - Channel 9 a Waves | 0.01477339 |
| 14 | Channel 13 b/a | 0.00808833 |
| 15 | Change in R-R Interval | 0.00773245 |

Table 5.3.123: Subject 10 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.18061196 |
| 2 | Channel 2 - Channel 13 b Waves | 0.12170519 |
| 3 | Channel 3 - Channel 12 b Waves | 0.12068502 |
| 4 | Channel 4 - Channel 11 b Waves | 0.10293699 |
| 5 | Channel 7 - Channel 8 b Waves | 0.0944373 |
| 6 | Channel 6 - Channel 9 b Waves | 0.05832299 |
| 7 | Channel 5 - Channel 10 a Waves | 0.03648044 |
| 8 | Channel 7 - Channel 8 a Waves | 0.03329993 |
| 9 | Channel 2 - Channel 13 a Waves | 0.03273348 |
| 10 | Channel 1 - Channel 14 b Waves | 0.0252148 |
| 11 | Channel 3 - Channel 12 a Waves | 0.02163577 |
| 12 | Channel 6 - Channel 9 a Waves | 0.02142591 |
| 13 | Pupil Average Diameter | 0.0202928 |
| 14 | Channel 13 b/a | 0.00862761 |
| 15 | Change in R-R Interval | 0.00787591 |

Table 5.3.124: Subject 10 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.22118498 |
| 2 | Channel 2 - Channel 13 b Waves | 0.15609328 |
| 3 | Channel 4 - Channel 11 b Waves | 0.10617772 |
| 4 | Channel 3 - Channel 12 b Waves | 0.0865826 |
| 5 | Channel 7 - Channel 8 b Waves | 0.06727532 |
| 6 | Channel 6 - Channel 9 b Waves | 0.04678714 |
| 7 | Channel 5 - Channel 10 a Waves | 0.04579649 |
| 8 | Channel 2 - Channel 13 a Waves | 0.04112122 |
| 9 | Channel 1 - Channel 14 b Waves | 0.02236137 |
| 10 | Pupil Average Diameter | 0.01984616 |
| 11 | Channel 7 - Channel 8 a Waves | 0.01692678 |
| 12 | Channel 3 - Channel 12 a Waves | 0.01663399 |
| 13 | Channel 6 - Channel 9 a Waves | 0.01086248 |
| 14 | Change in R-R Interval | 0.01040799 |
| 15 | Channel 4 b/a | 0.00943415 |

Table 5.3.125: Subject 10 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 2 - Channel 13 b Waves | 0.17321096 |
| 2 | Channel 5 - Channel 10 b Waves | 0.1559145 |
| 3 | Channel 4 - Channel 11 b Waves | 0.12488331 |
| 4 | Channel 3 - Channel 12 b Waves | 0.11359001 |
| 5 | Channel 7 - Channel 8 b Waves | 0.08744491 |
| 6 | Channel 2 - Channel 13 a Waves | 0.047957 |
| 7 | Channel 6 - Channel 9 b Waves | 0.04615918 |
| 8 | Channel 5 - Channel 10 a Waves | 0.04285391 |
| 9 | Channel 7 - Channel 8 a Waves | 0.02613026 |
| 10 | Channel 3 - Channel 12 a Waves | 0.01776 |
| 11 | Pupil Average Diameter | 0.01568486 |
| 12 | Channel 1 - Channel 14 b Waves | 0.01545489 |
| 13 | Channel 6 - Channel 9 a Waves | 0.01539457 |
| 14 | Channel 4 - Channel 11 a Waves | 0.01092847 |
| 15 | Channel 13 b/a | 0.00943743 |

Table 5.3.126: Subject 10 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 2 - Channel 13 b Waves | 0.17504512 |
| 2 | Channel 3 - Channel 12 b Waves | 0.1432314 |
| 3 | Channel 4 - Channel 11 b Waves | 0.13285098 |
| 4 | Channel 5 - Channel 10 b Waves | 0.11612888 |
| 5 | Channel 7 - Channel 8 b Waves | 0.0814188 |
| 6 | Channel 6 - Channel 9 b Waves | 0.04081696 |
| 7 | Channel 5 - Channel 10 a Waves | 0.03948757 |
| 8 | Channel 2 - Channel 13 a Waves | 0.03539026 |
| 9 | Channel 7 - Channel 8 a Waves | 0.03365448 |
| 10 | Channel 3 - Channel 12 a Waves | 0.02227672 |
| 11 | Pupil Average Diameter | 0.02084414 |
| 12 | Channel 6 - Channel 9 a Waves | 0.01476671 |
| 13 | Channel 4 - Channel 11 a Waves | 0.01253382 |
| 14 | Channel 1 - Channel 14 b Waves | 0.0117038 |
| 15 | Channel 13 b/a | 0.0113122 |

Table 5.3.127: Subject 10 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.23760545 |
| 2 | Channel 2 - Channel 13 b Waves | 0.15458323 |
| 3 | Channel 3 - Channel 12 b Waves | 0.09327524 |
| 4 | Channel 4 - Channel 11 b Waves | 0.09270522 |
| 5 | Channel 5 - Channel 10 a Waves | 0.06555976 |
| 6 | Channel 1 - Channel 14 b Waves | 0.04513562 |
| 7 | Channel 7 - Channel 8 b Waves | 0.03539321 |
| 8 | Channel 3 - Channel 12 a Waves | 0.03195007 |
| 9 | Channel 2 - Channel 13 a Waves | 0.03065102 |
| 10 | Channel 6 - Channel 9 b Waves | 0.02431572 |
| 11 | Pupil Average Diameter | 0.01964827 |
| 12 | Channel 7 - Channel 8 a Waves | 0.01295519 |
| 13 | Channel 4 - Channel 11 a Waves | 0.01153253 |
| 14 | Channel 13 b/a | 0.01071245 |
| 15 | Channel 4 b/a | 0.0101337 |

Table 5.3.128: Subject 10 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.2094901 |
| 2 | Channel 2 - Channel 13 b Waves | 0.19787756 |
| 3 | Channel 4 - Channel 11 b Waves | 0.09840474 |
| 4 | Channel 3 - Channel 12 b Waves | 0.06749687 |
| 5 | Channel 7 - Channel 8 b Waves | 0.06070495 |
| 6 | Channel 5 - Channel 10 a Waves | 0.0442299 |
| 7 | Channel 6 - Channel 9 b Waves | 0.04267935 |
| 8 | Pupil Average Diameter | 0.03550508 |
| 9 | Channel 2 - Channel 13 a Waves | 0.0324511 |
| 10 | Channel 1 - Channel 14 b Waves | 0.03174139 |
| 11 | Channel 7 - Channel 8 a Waves | 0.02128412 |
| 12 | Channel 3 - Channel 12 a Waves | 0.01909171 |
| 13 | Channel 6 - Channel 9 a Waves | 0.00954416 |
| 14 | Channel 4 - Channel 11 a Waves | 0.00937457 |
| 15 | Change in R-R Interval | 0.00915152 |

Table 5.3.129: Subject 10 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.22471368 |
| 2 | Channel 2 - Channel 13 b Waves | 0.14155945 |
| 3 | Channel 4 - Channel 11 b Waves | 0.09177882 |
| 4 | Channel 3 - Channel 12 b Waves | 0.08046893 |
| 5 | Channel 6 - Channel 9 b Waves | 0.07425526 |
| 6 | Channel 7 - Channel 8 b Waves | 0.06431674 |
| 7 | Channel 5 - Channel 10 a Waves | 0.03893657 |
| 8 | Channel 2 - Channel 13 a Waves | 0.03854279 |
| 9 | Channel 7 - Channel 8 a Waves | 0.02293232 |
| 10 | Channel 1 - Channel 14 b Waves | 0.02197092 |
| 11 | Pupil Average Diameter | 0.01830292 |
| 12 | Channel 3 - Channel 12 a Waves | 0.01674045 |
| 13 | Channel 6 - Channel 9 a Waves | 0.01358225 |
| 14 | Change in R-R Interval | 0.01146978 |
| 15 | Channel 4 b/a | 0.00962862 |

Table 5.3.130: Subject 10 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.24368325 |
| 2 | Channel 6 - Channel 9 b Waves | 0.10815573 |
| 3 | Channel 7 - Channel 8 b Waves | 0.09903444 |
| 4 | Channel 3 - Channel 12 b Waves | 0.08716845 |
| 5 | Channel 4 - Channel 11 b Waves | 0.07844934 |
| 6 | Channel 2 - Channel 13 b Waves | 0.07547567 |
| 7 | Channel 1 - Channel 14 b Waves | 0.03618897 |
| 8 | Channel 5 - Channel 10 a Waves | 0.03287485 |
| 9 | Pupil Average Diameter | 0.02658515 |
| 10 | Channel 7 - Channel 8 a Waves | 0.01991096 |
| 11 | Channel 2 - Channel 13 a Waves | 0.01796701 |
| 12 | Channel 6 - Channel 9 a Waves | 0.01432945 |
| 13 | Channel 3 - Channel 12 a Waves | 0.01401654 |
| 14 | Change in R-R Interval | 0.01212728 |
| 15 | Channel 6 b/a | 0.00954047 |

Table 5.3.131: Subject 10 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.18438406 |
| 2 | Channel 2 - Channel 13 b Waves | 0.17912381 |
| 3 | Channel 4 - Channel 11 b Waves | 0.09786964 |
| 4 | Channel 3 - Channel 12 b Waves | 0.08647672 |
| 5 | Channel 2 - Channel 13 a Waves | 0.06178406 |
| 6 | Channel 7 - Channel 8 b Waves | 0.06127396 |
| 7 | Channel 6 - Channel 9 b Waves | 0.05929619 |
| 8 | Channel 5 - Channel 10 a Waves | 0.04424779 |
| 9 | Channel 3 - Channel 12 a Waves | 0.02187457 |
| 10 | Channel 7 - Channel 8 a Waves | 0.02074586 |
| 11 | Channel 1 - Channel 14 b Waves | 0.01995277 |
| 12 | Channel 6 - Channel 9 a Waves | 0.01601457 |
| 13 | Pupil Average Diameter | 0.01422883 |
| 14 | Change in R-R Interval | 0.01114623 |
| 15 | Channel 13 b/a | 0.00834744 |

Table 5.3.132: Subject 10 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 2 - Channel 13 b Waves | 0.20518541 |
| 2 | Channel 5 - Channel 10 b Waves | 0.12939794 |
| 3 | Channel 4 - Channel 11 b Waves | 0.12830689 |
| 4 | Channel 7 - Channel 8 b Waves | 0.08829412 |
| 5 | Channel 3 - Channel 12 b Waves | 0.08448657 |
| 6 | Pupil Average Diameter | 0.04222016 |
| 7 | Channel 2 - Channel 13 a Waves | 0.04182216 |
| 8 | Channel 7 - Channel 8 a Waves | 0.03854457 |
| 9 | Channel 6 - Channel 9 b Waves | 0.03674938 |
| 10 | Channel 5 - Channel 10 a Waves | 0.03046385 |
| 11 | Channel 3 - Channel 12 a Waves | 0.02168817 |
| 12 | Channel 6 - Channel 9 a Waves | 0.01842528 |
| 13 | Channel 4 - Channel 11 a Waves | 0.0132758 |
| 14 | Channel 13 b/a | 0.01146052 |
| 15 | Channel 1 - Channel 14 b Waves | 0.00991191 |

Table 5.3.133: Subject 10 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.15785124 |
| 2 | Channel 2 - Channel 13 b Waves | 0.15681387 |
| 3 | Channel 4 - Channel 11 b Waves | 0.12840647 |
| 4 | Channel 3 - Channel 12 b Waves | 0.12230249 |
| 5 | Channel 7 - Channel 8 b Waves | 0.08569294 |
| 6 | Channel 2 - Channel 13 a Waves | 0.0657748 |
| 7 | Channel 6 - Channel 9 b Waves | 0.0579494 |
| 8 | Channel 5 - Channel 10 a Waves | 0.03372552 |
| 9 | Channel 7 - Channel 8 a Waves | 0.02225484 |
| 10 | Channel 3 - Channel 12 a Waves | 0.0208074 |
| 11 | Channel 1 - Channel 14 b Waves | 0.02049809 |
| 12 | Channel 6 - Channel 9 a Waves | 0.01275982 |
| 13 | Pupil Average Diameter | 0.00745135 |
| 14 | Channel 6 b/a | 0.00694809 |
| 15 | Channel 10 b/a | 0.00636918 |

Table 5.3.134: Subject 10 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 2 - Channel 13 b Waves | 0.20536588 |
| 2 | Channel 4 - Channel 11 b Waves | 0.17814422 |
| 3 | Channel 3 - Channel 12 b Waves | 0.11791539 |
| 4 | Channel 5 - Channel 10 b Waves | 0.10305485 |
| 5 | Channel 7 - Channel 8 b Waves | 0.06715305 |
| 6 | Channel 2 - Channel 13 a Waves | 0.05337543 |
| 7 | Channel 5 - Channel 10 a Waves | 0.03657036 |
| 8 | Channel 3 - Channel 12 a Waves | 0.02557824 |
| 9 | Channel 6 - Channel 9 b Waves | 0.0245898 |
| 10 | Pupil Average Diameter | 0.01685998 |
| 11 | Channel 7 - Channel 8 a Waves | 0.01599013 |
| 12 | Channel 4 - Channel 11 a Waves | 0.0153988 |
| 13 | Channel 6 - Channel 9 a Waves | 0.0116398 |
| 14 | Channel 13 b/a | 0.01136539 |
| 15 | Channel 1 - Channel 14 b Waves | 0.0110258 |

Table 5.3.135: Subject 11 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.08970258 |
| 2 | Channel 1 - Channel 14 a Waves | 0.07150178 |
| 3 | Channel 1 - Channel 14 b Waves | 0.05988464 |
| 4 | Channel 7 - Channel 8 a Waves | 0.05447833 |
| 5 | Channel 7 - Channel 8 b Waves | 0.05137971 |
| 6 | Change in R-R Interval | 0.04711191 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03327351 |
| 8 | Channel 3 - Channel 12 b Waves | 0.03037081 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02652717 |
| 10 | Channel 3 - Channel 12 a Waves | 0.0264644 |
| 11 | Channel 6 - Channel 9 b Waves | 0.02496237 |
| 12 | Channel 2 - Channel 13 a Waves | 0.0233359 |
| 13 | Channel 2 - Channel 13 b/a | 0.0219996 |
| 14 | Channel 6 - Channel 9 a Waves | 0.02165997 |
| 15 | Channel 13 b/a | 0.02128689 |

Table 5.3.136: Subject 11 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.08488058 |
| 2 | Channel 7 - Channel 8 b Waves | 0.05947392 |
| 3 | Change in R-R Interval | 0.05251211 |
| 4 | Channel 7 - Channel 8 a Waves | 0.04720642 |
| 5 | Channel 1 - Channel 14 a Waves | 0.04600386 |
| 6 | Channel 1 - Channel 14 b Waves | 0.04082227 |
| 7 | Channel 2 - Channel 13 b Waves | 0.0402462 |
| 8 | Channel 2 - Channel 13 a Waves | 0.02912447 |
| 9 | Channel 4 - Channel 11 b Waves | 0.0248561 |
| 10 | Channel 4 b/a | 0.02477122 |
| 11 | Channel 3 - Channel 12 b Waves | 0.02401406 |
| 12 | Channel 2 - Channel 13 b/a | 0.02310929 |
| 13 | Channel 3 - Channel 12 a Waves | 0.02300522 |
| 14 | Channel 6 - Channel 9 b Waves | 0.02291486 |
| 15 | Channel 13 b/a | 0.02279592 |

Table 5.3.137: Subject 11 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.08248647 |
| 2 | Channel 7 - Channel 8 a Waves | 0.07134649 |
| 3 | Pupil Average Diameter | 0.06548915 |
| 4 | Change in R-R Interval | 0.06506918 |
| 5 | Channel 2 - Channel 13 b Waves | 0.04013233 |
| 6 | Channel 4 - Channel 11 b Waves | 0.02992416 |
| 7 | Channel 2 - Channel 13 a Waves | 0.02792417 |
| 8 | Channel 1 - Channel 14 b Waves | 0.02735202 |
| 9 | Channel 1 - Channel 14 a Waves | 0.02730103 |
| 10 | Channel 2 b/a | 0.02387076 |
| 11 | Channel 6 - Channel 9 b Waves | 0.02359438 |
| 12 | Channel 7 b/a | 0.0232813 |
| 13 | Channel 13 b/a | 0.02172215 |
| 14 | Right Eye Euclidean Distance | 0.02163649 |
| 15 | Channel 6 - Channel 9 a Waves | 0.02120268 |

Table 5.3.138: Subject 11 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.06934437 |
| 2 | Change in R-R Interval | 0.06677118 |
| 3 | Channel 7 - Channel 8 b Waves | 0.06304414 |
| 4 | Channel 7 - Channel 8 a Waves | 0.05537669 |
| 5 | Channel 1 - Channel 14 b Waves | 0.05376282 |
| 6 | Channel 1 - Channel 14 a Waves | 0.04981036 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03896642 |
| 8 | Channel 2 - Channel 13 a Waves | 0.02776405 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02569125 |
| 10 | Channel 3 - Channel 12 b Waves | 0.02210546 |
| 11 | Channel 2 - Channel 13 b/a | 0.02194304 |
| 12 | Channel 1 b/a | 0.0216171 |
| 13 | Channel 6 - Channel 9 b Waves | 0.02109088 |
| 14 | Channel 2 b/a | 0.02083197 |
| 15 | Channel 13 b/a | 0.02044392 |

Table 5.3.139: Subject 11 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.07729292 |
| 2 | Channel 7 - Channel 8 a Waves | 0.07284378 |
| 3 | Pupil Average Diameter | 0.05746544 |
| 4 | Change in R-R Interval | 0.05254854 |
| 5 | Channel 1 - Channel 14 a Waves | 0.05129046 |
| 6 | Channel 1 - Channel 14 b Waves | 0.04379115 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03461133 |
| 8 | Channel 2 - Channel 13 a Waves | 0.02632731 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02400037 |
| 10 | Channel 3 - Channel 12 b Waves | 0.023726 |
| 11 | Channel 2 b/a | 0.02319604 |
| 12 | Channel 2 - Channel 13 b/a | 0.02258003 |
| 13 | Channel 1 b/a | 0.02182 |
| 14 | Channel 3 - Channel 12 a Waves | 0.02149503 |
| 15 | Channel 4 b/a | 0.02109287 |

Table 5.3.140: Subject 11 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.06539013 |
| 2 | Channel 7 - Channel 8 b Waves | 0.05826195 |
| 3 | Channel 7 - Channel 8 a Waves | 0.05776513 |
| 4 | Change in R-R Interval | 0.05510416 |
| 5 | Channel 1 - Channel 14 b Waves | 0.05039246 |
| 6 | Channel 1 - Channel 14 a Waves | 0.04828871 |
| 7 | Channel 3 - Channel 12 a Waves | 0.02873856 |
| 8 | Channel 3 - Channel 12 b Waves | 0.0276248 |
| 9 | Channel 2 - Channel 13 b Waves | 0.02718983 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02656789 |
| 11 | Channel 6 - Channel 9 b Waves | 0.02606379 |
| 12 | Channel 1 b/a | 0.02291951 |
| 13 | Channel 5 - Channel 10 b Waves | 0.02290275 |
| 14 | Channel 2 - Channel 13 a Waves | 0.02227917 |
| 15 | Channel 6 - Channel 9 a Waves | 0.02192851 |

Table 5.3.141: Subject 11 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.07173116 |
| 2 | Channel 7 - Channel 8 a Waves | 0.06954307 |
| 3 | Channel 7 - Channel 8 b Waves | 0.06871948 |
| 4 | Change in R-R Interval | 0.0457369 |
| 5 | Channel 1 - Channel 14 b Waves | 0.03655106 |
| 6 | Channel 1 - Channel 14 a Waves | 0.03547713 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03156893 |
| 8 | Channel 6 - Channel 9 b Waves | 0.02822716 |
| 9 | Channel 3 - Channel 12 a Waves | 0.02780259 |
| 10 | Channel 2 - Channel 13 a Waves | 0.02659192 |
| 11 | Channel 6 - Channel 9 a Waves | 0.02492834 |
| 12 | Channel 3 - Channel 12 b Waves | 0.0246804 |
| 13 | Channel 4 - Channel 11 b Waves | 0.02398948 |
| 14 | Channel 2 - Channel 13 b/a | 0.0236982 |
| 15 | Channel 2 b/a | 0.02260528 |

Table 5.3.142: Subject 11 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.12678533 |
| 2 | Channel 7 - Channel 8 b Waves | 0.06202064 |
| 3 | Channel 7 - Channel 8 a Waves | 0.05753843 |
| 4 | Change in R-R Interval | 0.0567189 |
| 5 | Channel 1 - Channel 14 b Waves | 0.02786437 |
| 6 | Channel 6 - Channel 9 b Waves | 0.02759849 |
| 7 | Channel 1 - Channel 14 a Waves | 0.02664489 |
| 8 | Channel 3 - Channel 12 b Waves | 0.02660957 |
| 9 | Channel 2 - Channel 13 b Waves | 0.02598459 |
| 10 | Channel 3 - Channel 12 a Waves | 0.02419384 |
| 11 | Channel 5 - Channel 10 a Waves | 0.02182763 |
| 12 | Channel 14 b/a | 0.02129137 |
| 13 | Channel 6 - Channel 9 a Waves | 0.02104194 |
| 14 | Channel 2 - Channel 13 a Waves | 0.02102544 |
| 15 | Channel 5 - Channel 10 b Waves | 0.02090137 |

Table 5.3.143: Subject 11 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.08024176 |
| 2 | Channel 7 - Channel 8 a Waves | 0.07173001 |
| 3 | Pupil Average Diameter | 0.05899614 |
| 4 | Change in R-R Interval | 0.0513186 |
| 5 | Channel 1 - Channel 14 b Waves | 0.04624734 |
| 6 | Channel 1 - Channel 14 a Waves | 0.04159763 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03157762 |
| 8 | Channel 4 - Channel 11 b Waves | 0.02711285 |
| 9 | Channel 6 - Channel 9 b Waves | 0.02605153 |
| 10 | Channel 4 b/a | 0.02402057 |
| 11 | Channel 3 - Channel 12 a Waves | 0.02341264 |
| 12 | Channel 2 - Channel 13 a Waves | 0.02337847 |
| 13 | Channel 1 b/a | 0.02309147 |
| 14 | Channel 5 - Channel 10 b Waves | 0.0220899 |
| 15 | Channel 13 b/a | 0.02077062 |

Table 5.3.144: Subject 11 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Pupil Average Diameter | 0.07732131 |
| 2 | Channel 7 - Channel 8 b Waves | 0.06983212 |
| 3 | Channel 7 - Channel 8 a Waves | 0.06580223 |
| 4 | Change in R-R Interval | 0.04042462 |
| 5 | Channel 1 - Channel 14 b Waves | 0.03781419 |
| 6 | Channel 1 - Channel 14 a Waves | 0.0360963 |
| 7 | Channel 2 - Channel 13 b Waves | 0.02812831 |
| 8 | Channel 2 - Channel 13 a Waves | 0.02632169 |
| 9 | Channel 4 b/a | 0.02630681 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02603682 |
| 11 | Channel 6 - Channel 9 b Waves | 0.02486934 |
| 12 | Channel 3 - Channel 12 a Waves | 0.02486807 |
| 13 | Channel 2 b/a | 0.02350466 |
| 14 | Channel 3 - Channel 12 b Waves | 0.02348425 |
| 15 | Channel 13 b/a | 0.0223798 |

Table 5.3.145: Subject 11 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.08466811 |
| 2 | Pupil Average Diameter | 0.06793798 |
| 3 | Change in R-R Interval | 0.06051394 |
| 4 | Channel 7 - Channel 8 a Waves | 0.05725701 |
| 5 | Channel 1 - Channel 14 b Waves | 0.04429618 |
| 6 | Channel 1 - Channel 14 a Waves | 0.04406232 |
| 7 | Channel 2 - Channel 13 b Waves | 0.02919307 |
| 8 | Channel 6 - Channel 9 b Waves | 0.02639737 |
| 9 | Channel 3 - Channel 12 a Waves | 0.02518164 |
| 10 | Channel 3 - Channel 12 b Waves | 0.02509922 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02499005 |
| 12 | Channel 4 - Channel 11 b Waves | 0.02457646 |
| 13 | Channel 6 - Channel 9 a Waves | 0.02173541 |
| 14 | Channel 13 b/a | 0.02101993 |
| 15 | Channel 7 - Channel 8 b/a | 0.02049233 |

Table 5.3.146: Subject 11 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.09252856 |
| 2 | Pupil Average Diameter | 0.08916944 |
| 3 | Channel 7 - Channel 8 a Waves | 0.07318112 |
| 4 | Change in R-R Interval | 0.07032157 |
| 5 | Channel 2 - Channel 13 b Waves | 0.0309879 |
| 6 | Channel 6 - Channel 9 b Waves | 0.03092649 |
| 7 | Channel 1 - Channel 14 a Waves | 0.02678277 |
| 8 | Channel 2 - Channel 13 a Waves | 0.02462399 |
| 9 | Channel 1 - Channel 14 b Waves | 0.02407452 |
| 10 | Channel 6 - Channel 9 a Waves | 0.0236768 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02311721 |
| 12 | Channel 4 b/a | 0.02291343 |
| 13 | Channel 7 b/a | 0.02093248 |
| 14 | Channel 3 - Channel 12 a Waves | 0.02001438 |
| 15 | Channel 5 - Channel 10 b Waves | 0.01988639 |

Table 5.3.147: Subject 11 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 7 - Channel 8 b Waves | 0.0817828 |
| 2 | Pupil Average Diameter | 0.07221344 |
| 3 | Channel 7 - Channel 8 a Waves | 0.07192076 |
| 4 | Change in R-R Interval | 0.05866354 |
| 5 | Channel 1 - Channel 14 a Waves | 0.04284874 |
| 6 | Channel 1 - Channel 14 b Waves | 0.0404852 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03207103 |
| 8 | Channel 3 - Channel 12 b Waves | 0.02730586 |
| 9 | Channel 4 - Channel 11 b Waves | 0.02629824 |
| 10 | Channel 3 - Channel 12 a Waves | 0.02577714 |
| 11 | Channel 2 - Channel 13 a Waves | 0.0253576 |
| 12 | Channel 4 b/a | 0.02230652 |
| 13 | Channel 6 - Channel 9 b Waves | 0.0210874 |
| 14 | Channel 4 - Channel 11 a Waves | 0.02108082 |
| 15 | Channel 2 b/a | 0.02063975 |

Table 5.3.148: Subject 12 Important Biosignal Ranking for Factor 1

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.16207562 |
| 2 | Channel 5 - Channel 10 a Waves | 0.0912122 |
| 3 | Channel 7 - Channel 8 b Waves | 0.08193624 |
| 4 | Change in R-R Interval | 0.03819931 |
| 5 | Channel 5 b/a | 0.03633131 |
| 6 | Channel 1 - Channel 14 b Waves | 0.03335531 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03210453 |
| 8 | Channel 3 - Channel 12 a Waves | 0.0290907 |
| 9 | Channel 3 - Channel 12 b Waves | 0.02895685 |
| 10 | Channel 7 - Channel 8 a Waves | 0.02893479 |
| 11 | Channel 4 - Channel 11 b Waves | 0.02767964 |
| 12 | Pupil Average Diameter | 0.02598211 |
| 13 | Channel 1 - Channel 14 a Waves | 0.02359013 |
| 14 | Channel 5 - Channel 10 b/a | 0.02215754 |
| 15 | Channel 2 - Channel 13 a Waves | 0.02020861 |

Table 5.3.149: Subject 12 Important Biosignal Ranking for Factor 2

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.14865421 |
| 2 | Channel 5 - Channel 10 a Waves | 0.083665 |
| 3 | Change in R-R Interval | 0.0628995 |
| 4 | Channel 3 - Channel 12 b Waves | 0.05375593 |
| 5 | Channel 7 - Channel 8 b Waves | 0.04535733 |
| 6 | Channel 1 - Channel 14 b Waves | 0.04001585 |
| 7 | Channel 3 - Channel 12 a Waves | 0.03348934 |
| 8 | Channel 5 b/a | 0.03061782 |
| 9 | Channel 1 - Channel 14 a Waves | 0.02827395 |
| 10 | Channel 2 - Channel 13 b Waves | 0.02716281 |
| 11 | Pupil Average Diameter | 0.02524904 |
| 12 | Channel 4 - Channel 11 b Waves | 0.02349188 |
| 13 | Channel 4 - Channel 11 b/a | 0.02258914 |
| 14 | Channel 1 b/a | 0.02110286 |
| 15 | Channel 5 - Channel 10 b/a | 0.02000954 |

Table 5.3.150: Subject 12 Important Biosignal Ranking for Factor 3

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.09571753 |
| 2 | Channel 7 - Channel 8 b Waves | 0.06548461 |
| 3 | Channel 5 - Channel 10 a Waves | 0.05715297 |
| 4 | Change in R-R Interval | 0.05325354 |
| 5 | Channel 3 - Channel 12 b Waves | 0.04979118 |
| 6 | Channel 1 - Channel 14 b Waves | 0.04162288 |
| 7 | Channel 3 - Channel 12 a Waves | 0.03768645 |
| 8 | Channel 2 - Channel 13 b Waves | 0.03351922 |
| 9 | Channel 5 b/a | 0.03270814 |
| 10 | Channel 1 - Channel 14 a Waves | 0.03172557 |
| 11 | Channel 5 - Channel 10 b/a | 0.02966409 |
| 12 | Channel 4 - Channel 11 b Waves | 0.02915982 |
| 13 | Channel 7 - Channel 8 a Waves | 0.02508026 |
| 14 | Channel 6 - Channel 9 b Waves | 0.02491943 |
| 15 | Channel 1 b/a | 0.02453626 |

Table 5.3.151: Subject 12 Important Biosignal Ranking for “Like”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.11300839 |
| 2 | Channel 7 - Channel 8 b Waves | 0.08041131 |
| 3 | Channel 5 - Channel 10 a Waves | 0.04910921 |
| 4 | Channel 4 - Channel 11 b Waves | 0.04741013 |
| 5 | Change in R-R Interval | 0.04529813 |
| 6 | Channel 3 - Channel 12 b Waves | 0.04269146 |
| 7 | Channel 2 - Channel 13 b Waves | 0.04107746 |
| 8 | Channel 3 - Channel 12 a Waves | 0.02904471 |
| 9 | Pupil Average Diameter | 0.02882794 |
| 10 | Channel 1 - Channel 14 b Waves | 0.02862101 |
| 11 | Channel 7 - Channel 8 a Waves | 0.02598718 |
| 12 | Channel 1 - Channel 14 a Waves | 0.0242878 |
| 13 | Channel 4 - Channel 11 b/a | 0.02422978 |
| 14 | Channel 5 b/a | 0.02391982 |
| 15 | Channel 2 - Channel 13 a Waves | 0.02334842 |

Table 5.3.152: Subject 12 Important Biosignal Ranking for “Want to Watch”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.11013745 |
| 2 | Channel 7 - Channel 8 b Waves | 0.08445231 |
| 3 | Channel 5 - Channel 10 a Waves | 0.06015257 |
| 4 | Change in R-R Interval | 0.05952323 |
| 5 | Channel 3 - Channel 12 b Waves | 0.04239448 |
| 6 | Channel 2 - Channel 13 b Waves | 0.03687657 |
| 7 | Channel 4 - Channel 11 b Waves | 0.03666474 |
| 8 | Channel 3 - Channel 12 a Waves | 0.03136 |
| 9 | Channel 1 - Channel 14 b Waves | 0.03041518 |
| 10 | Pupil Average Diameter | 0.02730304 |
| 11 | Channel 1 - Channel 14 a Waves | 0.02564713 |
| 12 | Channel 5 - Channel 10 b/a | 0.02344788 |
| 13 | Channel 4 - Channel 11 b/a | 0.02320199 |
| 14 | Channel 7 - Channel 8 a Waves | 0.02247554 |
| 15 | Channel 2 - Channel 13 a Waves | 0.02217563 |

Table 5.3.153: Subject 12 Important Biosignal Ranking for “Pleasant”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.1122508 |
| 2 | Channel 7 - Channel 8 b Waves | 0.09942149 |
| 3 | Channel 5 - Channel 10 a Waves | 0.04547883 |
| 4 | Channel 4 - Channel 11 b Waves | 0.04201766 |
| 5 | Pupil Average Diameter | 0.04201474 |
| 6 | Change in R-R Interval | 0.04157178 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03312624 |
| 8 | Channel 4 - Channel 11 b/a | 0.02714372 |
| 9 | Channel 7 - Channel 8 a Waves | 0.02634277 |
| 10 | Channel 5 b/a | 0.02557178 |
| 11 | Channel 11 b/a | 0.02498557 |
| 12 | Channel 5 - Channel 10 b/a | 0.02444014 |
| 13 | Channel 6 - Channel 9 b Waves | 0.02435279 |
| 14 | Channel 1 - Channel 14 b Waves | 0.02376491 |
| 15 | Channel 4 b/a | 0.02257128 |

Table 5.3.154: Subject 12 Important Biosignal Ranking for “Happy”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.1276565 |
| 2 | Channel 7 - Channel 8 b Waves | 0.07282035 |
| 3 | Channel 5 - Channel 10 a Waves | 0.07199282 |
| 4 | Change in R-R Interval | 0.05832862 |
| 5 | Channel 2 - Channel 13 b Waves | 0.04705726 |
| 6 | Channel 3 - Channel 12 b Waves | 0.03857164 |
| 7 | Channel 1 - Channel 14 b Waves | 0.03592481 |
| 8 | Channel 3 - Channel 12 a Waves | 0.03221421 |
| 9 | Pupil Average Diameter | 0.03167894 |
| 10 | Channel 4 - Channel 11 b Waves | 0.02836813 |
| 11 | Channel 2 - Channel 13 a Waves | 0.02665075 |
| 12 | Channel 7 - Channel 8 a Waves | 0.02555826 |
| 13 | Channel 1 b/a | 0.02541293 |
| 14 | Channel 8 b/a | 0.02416967 |
| 15 | Channel 1 - Channel 14 a Waves | 0.02395729 |

Table 5.3.155: Subject 12 Important Biosignal Ranking for “Emotional”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.11668303 |
| 2 | Channel 5 - Channel 10 a Waves | 0.07630899 |
| 3 | Change in R-R Interval | 0.04766217 |
| 4 | Channel 3 - Channel 12 b Waves | 0.04183898 |
| 5 | Channel 7 - Channel 8 b Waves | 0.04117692 |
| 6 | Channel 1 - Channel 14 b Waves | 0.03562354 |
| 7 | Channel 3 - Channel 12 a Waves | 0.03530356 |
| 8 | Channel 2 - Channel 13 b Waves | 0.03515247 |
| 9 | Channel 4 - Channel 11 b Waves | 0.03271121 |
| 10 | Pupil Average Diameter | 0.03252484 |
| 11 | Channel 1 - Channel 14 a Waves | 0.03145436 |
| 12 | Channel 5 - Channel 10 b/a | 0.02838568 |
| 13 | Channel 7 - Channel 8 a Waves | 0.02568884 |
| 14 | Channel 5 b/a | 0.02427714 |
| 15 | Channel 2 - Channel 13 a Waves | 0.0228966 |

Table 5.3.156: Subject 12 Important Biosignal Ranking for “Quality”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.09092226 |
| 2 | Channel 5 - Channel 10 a Waves | 0.05881342 |
| 3 | Channel 3 - Channel 12 b Waves | 0.0574121 |
| 4 | Channel 1 - Channel 14 b Waves | 0.05108809 |
| 5 | Change in R-R Interval | 0.04831951 |
| 6 | Channel 2 - Channel 13 b Waves | 0.04562841 |
| 7 | Channel 7 - Channel 8 b Waves | 0.04483267 |
| 8 | Channel 3 - Channel 12 a Waves | 0.04473718 |
| 9 | Channel 1 - Channel 14 a Waves | 0.04182347 |
| 10 | Channel 4 - Channel 11 b Waves | 0.03206798 |
| 11 | Pupil Average Diameter | 0.03014619 |
| 12 | Channel 5 b/a | 0.02543731 |
| 13 | Channel 6 - Channel 9 b Waves | 0.02296672 |
| 14 | Channel 5 - Channel 10 b/a | 0.02294204 |
| 15 | Channel 8 b/a | 0.02221012 |

Table 5.3.157: Subject 12 Important Biosignal Ranking for “Interest”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.10200413 |
| 2 | Channel 7 - Channel 8 b Waves | 0.09163115 |
| 3 | Pupil Average Diameter | 0.04907958 |
| 4 | Change in R-R Interval | 0.04754267 |
| 5 | Channel 5 - Channel 10 a Waves | 0.04556279 |
| 6 | Channel 4 - Channel 11 b Waves | 0.03330663 |
| 7 | Channel 2 - Channel 13 b Waves | 0.03193473 |
| 8 | Channel 7 - Channel 8 a Waves | 0.02710014 |
| 9 | Channel 1 - Channel 14 b Waves | 0.02656433 |
| 10 | Channel 8 b/a | 0.02613979 |
| 11 | Channel 5 b/a | 0.02556573 |
| 12 | Channel 4 - Channel 11 b/a | 0.02425145 |
| 13 | Channel 3 - Channel 12 a Waves | 0.02391582 |
| 14 | Channel 1 b/a | 0.02389788 |
| 15 | Channel 5 - Channel 10 b/a | 0.02349231 |

Table 5.3.158: Subject 12 Important Biosignal Ranking for “Light-Hearted”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.08851257 |
| 2 | Channel 3 - Channel 12 b Waves | 0.06610169 |
| 3 | Change in R-R Interval | 0.06309968 |
| 4 | Channel 1 - Channel 14 b Waves | 0.05302658 |
| 5 | Channel 7 - Channel 8 b Waves | 0.04764217 |
| 6 | Channel 5 - Channel 10 a Waves | 0.04492687 |
| 7 | Channel 1 - Channel 14 a Waves | 0.04376217 |
| 8 | Channel 3 - Channel 12 a Waves | 0.04373145 |
| 9 | Channel 2 - Channel 13 b Waves | 0.03968705 |
| 10 | Pupil Average Diameter | 0.03658482 |
| 11 | Channel 1 b/a | 0.03024341 |
| 12 | Channel 4 - Channel 11 b Waves | 0.02461779 |
| 13 | Channel 6 - Channel 9 b Waves | 0.02349014 |
| 14 | Channel 2 - Channel 13 a Waves | 0.02340012 |
| 15 | Channel 1 - Channel 14 b/a | 0.02327343 |

Table 5.3.159: Subject 12 Important Biosignal Ranking for “Warm”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.13370461 |
| 2 | Channel 5 - Channel 10 a Waves | 0.0796793 |
| 3 | Change in R-R Interval | 0.06402732 |
| 4 | Channel 7 - Channel 8 b Waves | 0.05835081 |
| 5 | Channel 3 - Channel 12 b Waves | 0.04274899 |
| 6 | Channel 2 - Channel 13 b Waves | 0.03905879 |
| 7 | Channel 4 - Channel 11 b Waves | 0.03569619 |
| 8 | Channel 1 - Channel 14 b Waves | 0.03540843 |
| 9 | Channel 3 - Channel 12 a Waves | 0.0315577 |
| 10 | Channel 1 - Channel 14 a Waves | 0.02536858 |
| 11 | Channel 7 - Channel 8 a Waves | 0.02455138 |
| 12 | Pupil Average Diameter | 0.02407862 |
| 13 | Channel 2 - Channel 13 a Waves | 0.02387872 |
| 14 | Channel 6 - Channel 9 b Waves | 0.02276102 |
| 15 | Channel 5 b/a | 0.0222089 |

Table 5.3.160: Subject 12 Important Biosignal Ranking for “Impression”

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.11403216 |
| 2 | Channel 7 - Channel 8 b Waves | 0.08068874 |
| 3 | Change in R-R Interval | 0.06838096 |
| 4 | Channel 5 - Channel 10 a Waves | 0.06219587 |
| 5 | Channel 3 - Channel 12 b Waves | 0.04608232 |
| 6 | Channel 2 - Channel 13 b Waves | 0.03701884 |
| 7 | Channel 4 - Channel 11 b Waves | 0.03440785 |
| 8 | Channel 3 - Channel 12 a Waves | 0.03274407 |
| 9 | Channel 1 - Channel 14 b Waves | 0.0313167 |
| 10 | Pupil Average Diameter | 0.03110381 |
| 11 | Channel 1 - Channel 14 a Waves | 0.02555001 |
| 12 | Channel 6 - Channel 9 b Waves | 0.02480259 |
| 13 | Channel 5 b/a | 0.02268052 |
| 14 | Channel 7 - Channel 8 a Waves | 0.02225164 |
| 15 | Channel 4 - Channel 11 b/a | 0.02100434 |

## Discussion

The train and test results are found for every subject and their average, maximum and minimum is shown in Table 5.4.1.

Table 5.4.1: Maximum, Average, and Minimum of Train and Test Accuracy

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Train Accuracy | | | Test | | |
|  | MAX | AVERAGE | MIN | MAX | AVERAGE | MIN |
| Factor 1 | 0.987 | 0.953 | 0.913 | 0.959 | 0.673 | 0.521 |
| Factor 2 | 0.989 | 0.954 | 0.903 | 0.980 | 0.691 | 0.523 |
| Factor 3 | 0.986 | 0.954 | 0.916 | 0.968 | 0.720 | 0.519 |
| Like | 0.994 | 0.960 | 0.93 | 0.966 | 0.738 | 0.612 |
| Want to Watch | 0.988 | 0.956 | 0.926 | 0.972 | 0.723 | 0.552 |
| Pleasant | 0.987 | 0.956 | 0.925 | 0.966 | 0.755 | 0.607 |
| Happy | 0.985 | 0.948 | 0.897 | 0.956 | 0.725 | 0.557 |
| Emotional | 0.992 | 0.958 | 0.934 | 0.978 | 0.734 | 0.501 |
| Quality | 0.993 | 0.964 | 0.937 | 0.962 | 0.722 | 0.535 |
| Interest | 0.986 | 0.949 | 0.908 | 0.962 | 0.726 | 0.582 |
| Light-Hearted | 0.988 | 0.939 | 0.872 | 0.961 | 0.740 | 0.580 |
| Exciting | 0.987 | 0.955 | 0.911 | 0.960 | 0.752 | 0.618 |
| Warm | 0.988 | 0.947 | 0.909 | 0.965 | 0.725 | 0.548 |
| Impression | 0.990 | 0.941 | 0.868 | 0.964 | 0.738 | 0.589 |

The discrepancy between the subjects is quite large; some subjects have a test accuracy past 95% whereas a subject on the lower end of the spectrum only achieve an accuracy around 52%. Subjects 8 and 10 have an accuracy for more 90%. Most of the others are all around the average of being in the 70% range. Though the accuracy varies from each individual, random forest is able to predict a user’s preferences.

Because a user’s preference is closely linked towards “Like”, “Want to Watch” and “Interest”, they carry the most significance in determining a user’s preference. The top 3 biosignals for the mentioned categories are shown for every subject. They are shown in Table 5.4.2: Top Biosignals for “Like”, Table 5.4.3: Top Biosignals for “Want to Watch”, and Table 5.4.4: Top Biosignals for “Interest”. The channel names are converted accordingly to the corresponding lobes mentioned in Table 4.1.1. As seen in the three tables, pupil average diameter is also seen throughout the top 3. In addition, one third of the subjects have change in their R-R interval as their most important signal for “Want to Watch”. Frontal lobe brain activity is also significant.

Table 5.4.2: Top Biosignals for “Like”

|  |  |  |  |
| --- | --- | --- | --- |
| Subject | 1st | 2nd | 3rd |
| 1 | Frontal Lobe b Waves | Frontal Lobe a Waves | Pupil Average Diameter |
| 2 | Change in R-R Interval | Pupil Average Diameter | Frontal Lobe b Waves |
| 3 | Pupil Average Diameter | Change in R-R Interval | Frontal Lobe b Waves |
| 4 | Change in R-R Interval | Frontal Lobe b Waves | Pupil Average Diameter |
| 5 | Frontal Lobe b Waves | Frontal Lobe a Waves | Pupil Average Diameter |
| 6 | Pupil Average Diameter | Occipital Lobe b Waves | Change in R-R Interval |
| 7 | Frontal Lobe a Waves | Frontal Lobe b Waves | Pupil Average Diameter |
| 8 | Frontal Lobe b Waves | Frontal Lobe b Waves | Frontal Lobe b Waves |
| 9 | Pupil Average Diameter | Frontal Lobe b Waves | Change in R-R Interval |
| 10 | Frontal Lobe b Waves | Temporal b Waves | Frontal Lobe b Waves |
| 11 | Pupil Average Diameter | Change in R-R Interval | Occipital Lobe b Waves |
| 12 | Temporal Lobe b Waves | Occipital Lobe b Waves | Temporal Lobe a Waves |

Table 5.4.3: Top Biosignals for “Want to Watch”

|  |  |  |  |
| --- | --- | --- | --- |
| Subject | 1st | 2nd | 3rd |
| 1 | Change in R-R Interval | Frontal Lobe b Waves | Frontal Lobe a Waves |
| 2 | Change in R-R Interval | Pupil Average Diameter | Frontal Lobe b Waves |
| 3 | Change in R-R Interval | Temporal Lobe b Waves | Pupil Average Diameter |
| 4 | Change in R-R Interval | Pupil Average Diameter | Frontal Lobe b Waves |
| 5 | Frontal Lobe a Waves | Frontal Lobe b Waves | Change in R-R Interval |
| 6 | Occipital Lobe b Waves | Pupil Average Diameter | Occipital Lobe a Waves |
| 7 | Frontal Lobe a Waves | Frontal Lobe b Waves | Frontal Lobe b Waves |
| 8 | Frontal Lobe b Waves | Parietal Lobe b Waves | Frontal Lobe b Waves |
| 9 | Pupil Average Diameter | Frontal Lobe b Waves | Frontal Lobe b Waves |
| 10 | Frontal Lobe b Waves | Frontal Lobe b Waves | Frontal Lobe b Waves |
| 11 | Occipital Lobe b Waves | Occipital Lobe a Waves | Pupil Average Diameter |
| 12 | Temporal Lobe b Waves | Occipital Lobe b Waves | Temporal Lobe a Waves |

Table 5.4.4: Top Biosignals for “Interest”

|  |  |  |  |
| --- | --- | --- | --- |
| Subject | 1st | 2nd | 3rd |
| 1 | Change in R-R Interval | Pupil Average Diameter | Frontal Lobe b Waves |
| 2 | Change in R-R Interval | Frontal Lobe b Waves | Pupil Average Diameter |
| 3 | Change in R-R Interval | Pupil Average Diameter | Frontal Lobe b Waves |
| 4 | Change in R-R Interval | Frontal Lobe b Waves | Frontal Lobe a Waves |
| 5 | Frontal Lobe b Waves | Frontal Lobe a Waves | Frontal Lobe b Waves |
| 6 | Occipital Lobe b Waves | Pupil Average Diameter | Change in R-R Interval |
| 7 | Frontal Lobe a Waves | Frontal Lobe b Waves | Frontal Lobe a Waves |
| 8 | Frontal Lobe b Waves | Frontal Lobe b Waves | Temporal Lobe b Waves |
| 9 | Pupil Average Diameter | Occipital Lobe b Waves | Frontal Lobe a Waves |
| 10 | Parietal Lobe b Waves | Frontal Lobe b Waves | Frontal Lobe b Waves |
| 11 | Pupil Average Diameter | Occipital Lobe b Waves | Occipital Lobe a Waves |
| 12 | Temporal Lobe b Waves | Occipital Lobe b Waves | Pupil Average Diameter |

Average pupil size is, as expected, a biosignal that can determine whether a user likes the content. Heart rate is often known to go up when watching something exciting –in some cases, one becomes curious and wants to watch the content. However, this may not be a sign that everyone wants to watch an action movie; it is possible that the sample set taken does not contain people of various ages and thus may be inaccurate for the general populace but is correct for the age range or backgrounds. The important biosignals also vary from person to person. From the importance rankings of every subject, the presence of brainwaves is quite notable. It is also possible for the brainwaves to signify what a subject is watching is focusing on.

Different lobes may account for different preferences. For instance, Subject 10 likes Fantasy, Mystery, and Thriller and dislikes Documentary, Family and Romance. In accordance to this, the importance of the biosignals “Excitement” and “Factor 3”, which is depicted by the lack of excitement and the prevalence of emotion is shown in Table 5.4.5: Important Biosignals in “Exciting” for Subject 10 and Table 5.4.6: Important Biosignals in Factor 3 for Subject 10 respectively. The test accuracy for “Exciting” is 95.5% and for Factor 3 is 94.3%. The brainwaves found in different lobes are colored differently; frontal is in blue, temporal is in red, parietal is in green, and occipital is in orange. The result of the confusion matrix is shown in Fig. 5.4.1 Prediction Heatmap for Subject 10 “Exciting” and Fig. 5.4.2 Prediction Heatmap for Subject 10 “Factor 3” respectively. The horizontal axis depicts the actual value while the vertical axis depicts the predicted value. The diagonal represents the correct predictions. The numbers represent the number of predictions.

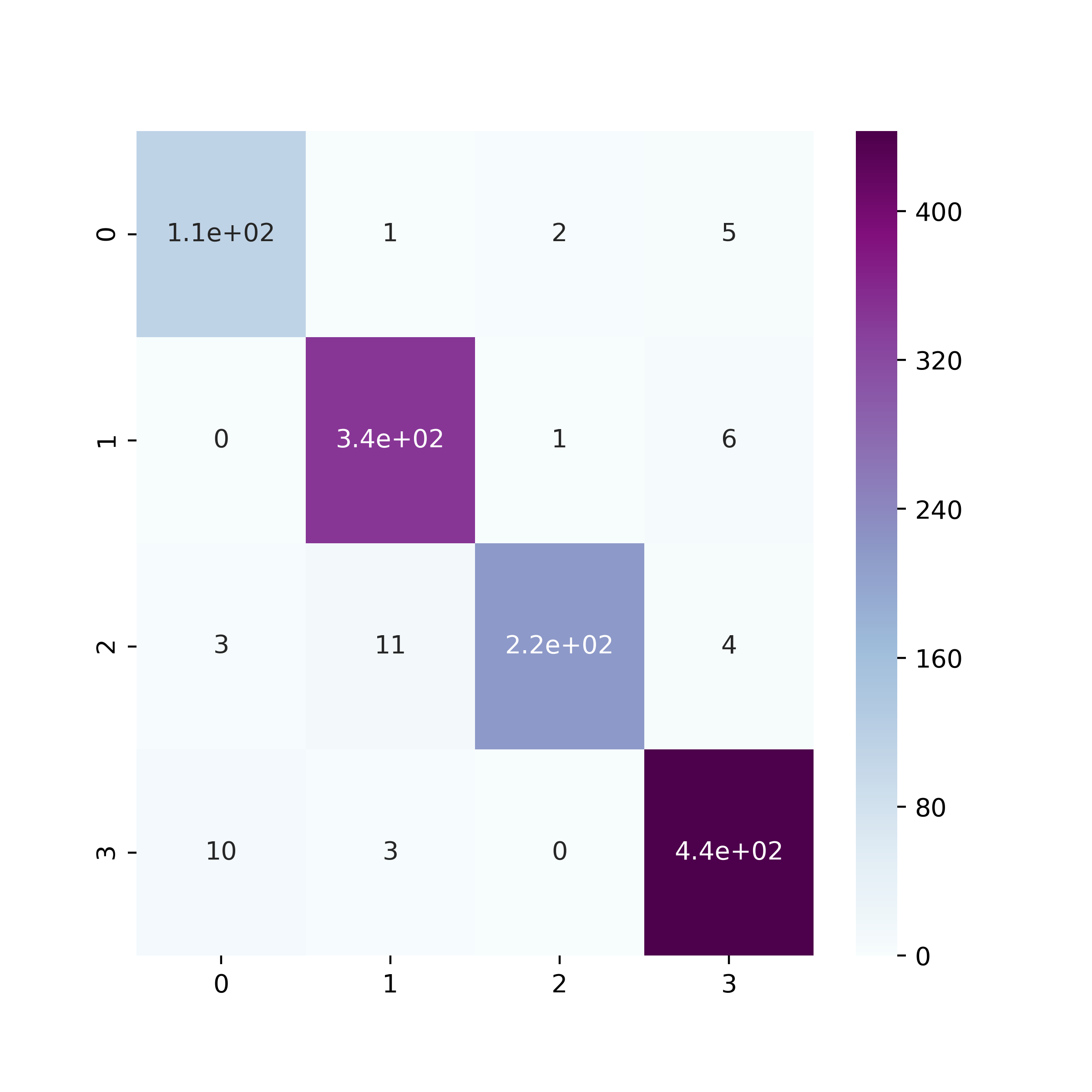


Fig. 5.4.1 Prediction Heatmap for Subject 10 “Exciting”

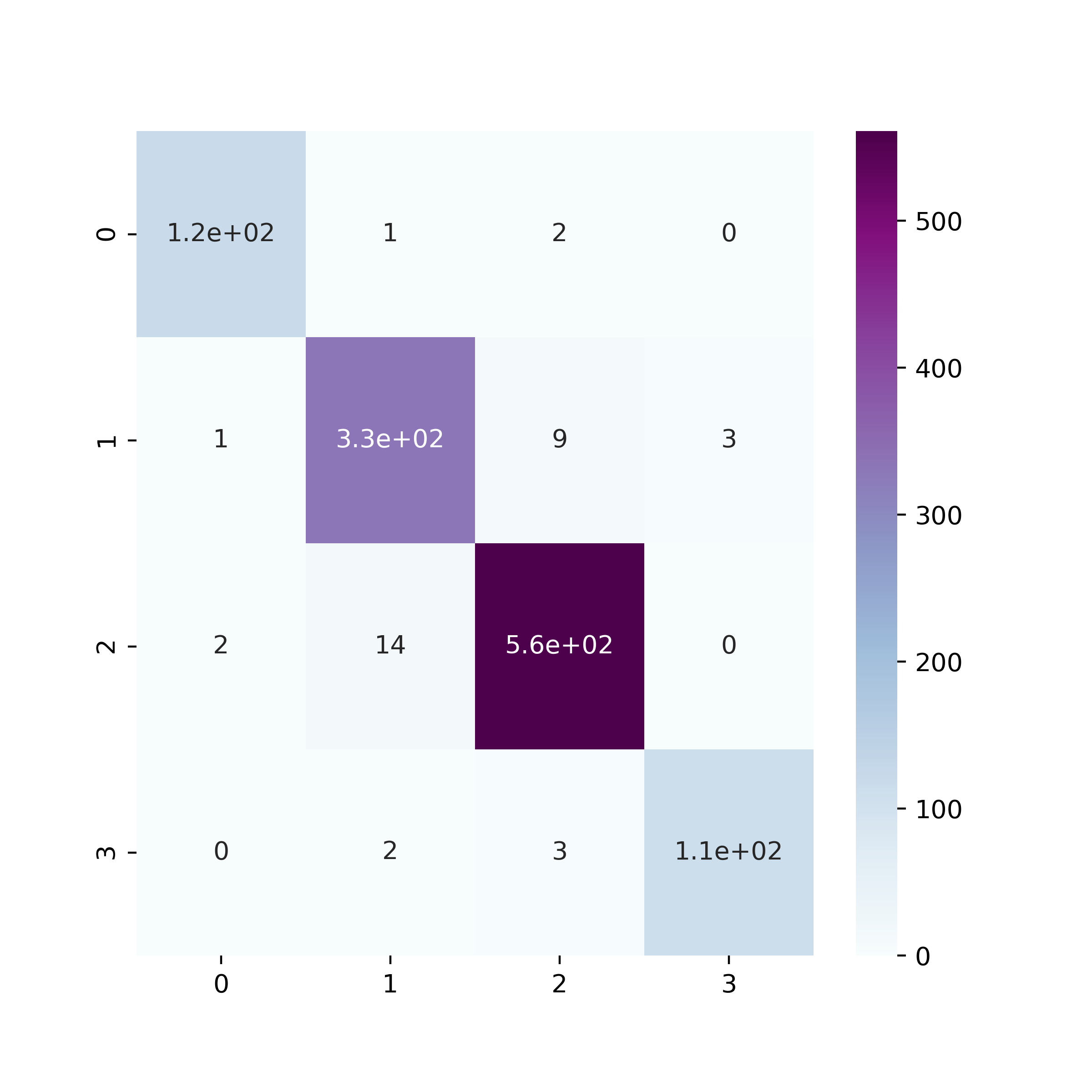


Fig. 5.4.2 Prediction Heatmap for Subject 10 “Factor 3”

Table 5.4.5: Important Biosignals in “Exciting” for Subject 10

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.15578379 |
| 2 | Channel 4 - Channel 11 b Waves | 0.14774521 |
| 3 | Channel 3 - Channel 12 b Waves | 0.12388135 |
| 4 | Channel 2 - Channel 13 b Waves | 0.11929929 |
| 5 | Channel 7 - Channel 8 b Waves | 0.11642307 |
| 6 | Channel 6 - Channel 9 b Waves | 0.03925821 |
| 7 | Channel 5 - Channel 10 a Waves | 0.03798951 |
| 8 | Channel 2 - Channel 13 a Waves | 0.03150049 |
| 9 | Channel 7 - Channel 8 a Waves | 0.03143447 |
| 10 | Channel 1 - Channel 14 b Waves | 0.02915496 |

Table 5.4.6: Important Biosignals in Factor 3 for Subject 10

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 5 - Channel 10 b Waves | 0.22118498 |
| 2 | Channel 2 - Channel 13 b Waves | 0.15609328 |
| 3 | Channel 4 - Channel 11 b Waves | 0.10617772 |
| 4 | Channel 3 - Channel 12 b Waves | 0.0865826 |
| 5 | Channel 7 - Channel 8 b Waves | 0.06727532 |
| 6 | Channel 6 - Channel 9 b Waves | 0.04678714 |
| 7 | Channel 5 - Channel 10 a Waves | 0.04579649 |
| 8 | Channel 2 - Channel 13 a Waves | 0.04112122 |
| M9 | Channel 1 - Channel 14 b Waves | 0.02236137 |
| 10 | Pupil Average Diameter | 0.01984616 |

In Table 5.4.5, it is notable that the *β* waves are the most common in the first five categories and have over 10% importance. The temporal lobe is associated with vision and processing sensory input. On the other hand, the frontal lobe (in blue) is known for emotional expression, judgement and etc. In Subject 10’s case, thriller was one of the favorite genres; the temporal lobe beta wave’s importance was higher by around 7% in factor 3. This could imply that more attention was directed to the visuals than the storyline or the emotions.

In contrast, Subject 8 likes Documentary, Family, and Romance and dislikes Fantasy, Horror and Thriller. The test accuracy for “Exciting” is 96.0% and for Factor 3 is 96.8%. The result of the confusion matrices is shown in Fig. 5.4.3 Prediction Heatmap for Subject 8 “Exciting” and Fig. 5.4.4 Prediction Heatmap for Subject 8 “Factor 3” respectively. Table 5.4.7: Important Biosignals in “Exciting” for Subject 8 shows the significant biosignals for “Exciting” and Table 5.4.8: Important Biosignals in Factor 3 for Subject 8 for “Factor 3”.

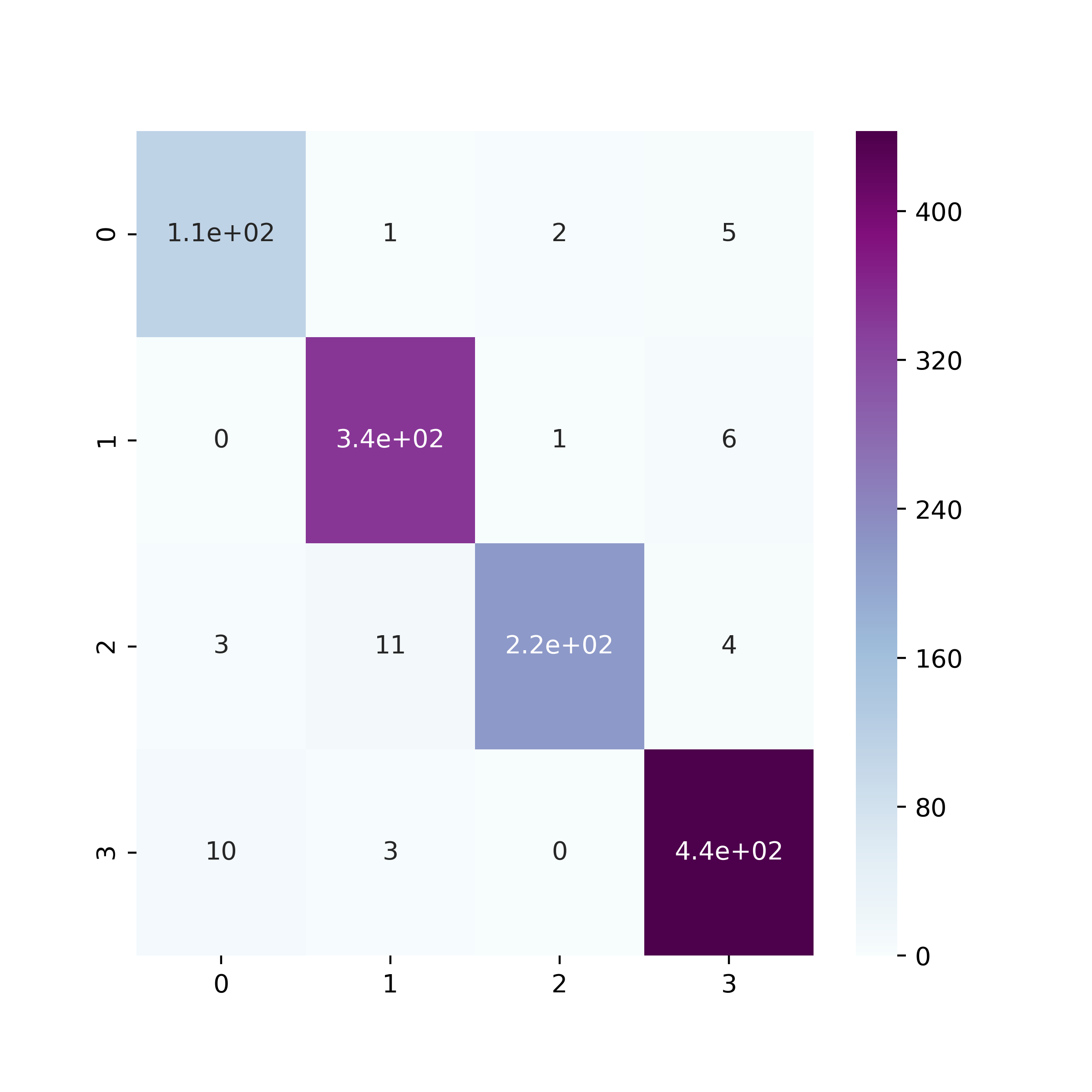


Fig. 5.4.3 Prediction Heatmap for Subject 8 “Exciting”

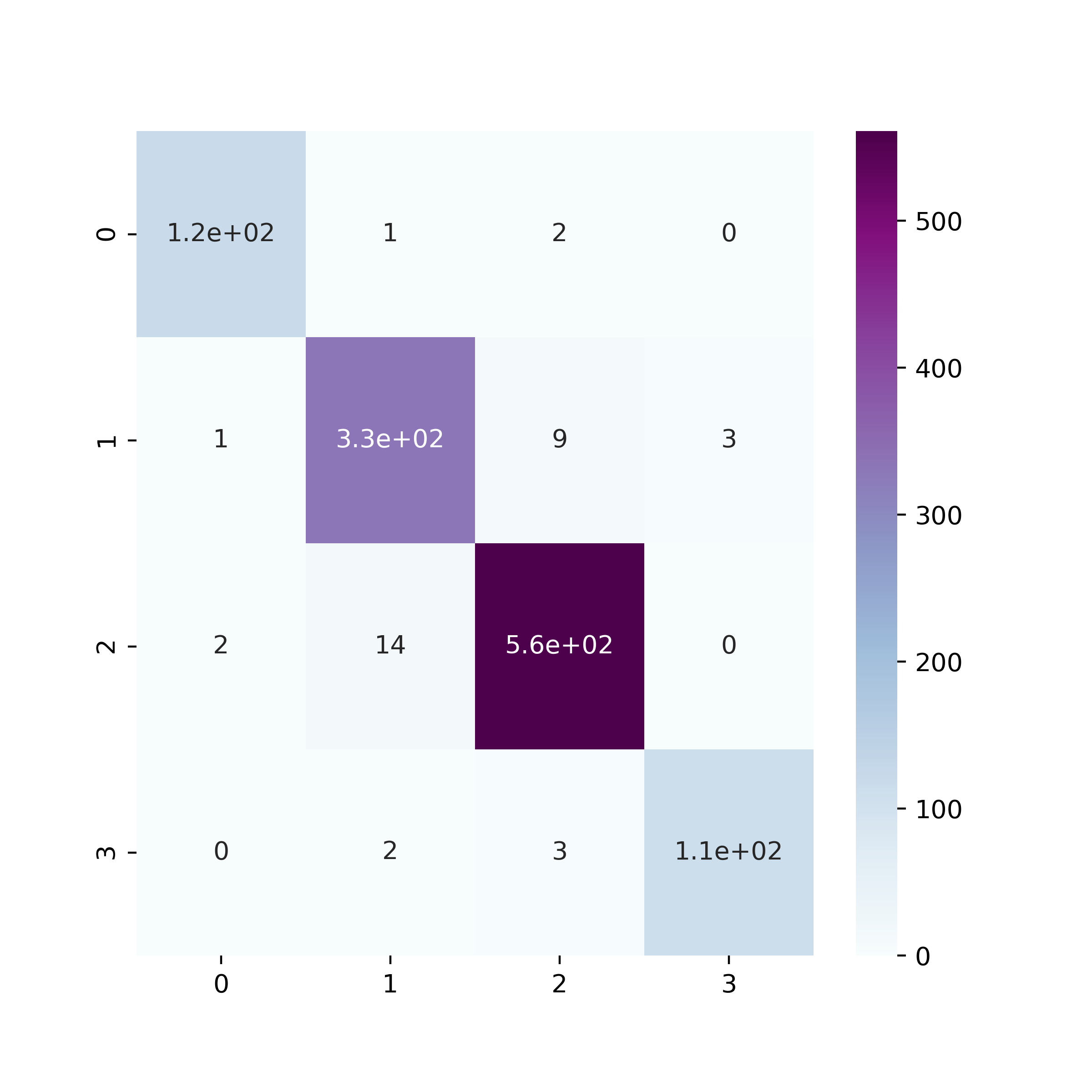


Fig. 5.4.4 Prediction Heatmap for Subject 8 “Factor 3”

Table 5.8: Important Biosignals in “Exciting” for Subject 8

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.13170525 |
| 2 | Channel 5 - Channel 10 b Waves | 0.12404938 |
| 3 | Channel 2 - Channel 13 b Waves | 0.09329359 |
| 4 | Channel 4 - Channel 11 b Waves | 0.09133025 |
| 5 | Channel 6 - Channel 9 b Waves | 0.08126271 |
| 6 | Channel 1 - Channel 14 b Waves | 0.07017969 |
| 7 | Pupil Average Diameter | 0.06836463 |
| 8 | Channel 4 - Channel 11 a Waves | 0.0341096 |
| 9 | Channel 3 - Channel 12 a Waves | 0.03028709 |
| 10 | Channel 5 - Channel 10 a Waves | 0.02772242 |

Table 5.4.8: Important Biosignals in Factor 3 for Subject 8

|  |  |  |
| --- | --- | --- |
|  | variables | importance |
| 1 | Channel 3 - Channel 12 b Waves | 0.12924606 |
| 2 | Channel 5 - Channel 10 b Waves | 0.11749783 |
| 3 | Channel 4 - Channel 11 b Waves | 0.11115742 |
| 4 | Channel 6 - Channel 9 b Waves | 0.09278023 |
| 5 | Channel 2 - Channel 13 b Waves | 0.06224641 |
| 6 | Channel 4 - Channel 11 a Waves | 0.05651143 |
| 7 | Channel 1 - Channel 14 b Waves | 0.05499707 |
| 8 | Pupil Average Diameter | 0.05374313 |
| 9 | Channel 3 - Channel 12 a Waves | 0.03372056 |
| 10 | Channel 2 - Channel 13 a Waves | 0.0290697 |

For Subject 8, the importance of frontal lobe and temporal lobe brainwaves are around the same: 12.9% and 11.7%. This is an indication that no extra attention is paid to the visuals as Subject 10 did. Biosignals imply that Subject 10 focuses on action or visuals whereas Subject 8 prefers to focus on the emotion or the storyline more than the visuals in comparison.

# Chapter 6 Conclusion

## Summary

This experiment showed that it is possible to predict whether one would like a movie trailer by up to 96.6%. In addition, it also presented evidence on how biosignals could actually determine whether a user wants to watch a movie. Though the prediction accuracy was different according to users, it is found that random forest can on average predict whether a user likes a movie with a 72.3% accuracy.

The results also demonstrate the biosignal that holds the most importance in predicting a user’s preference. From the data collected, the biosignals that influence whether a user likes the content is determined mainly by heart rate, pupil size, and brainwaves in the frontal lobe, especially β waves.

Depending on the user, the most important biosignals are different. This can reflect a user’s preferences in genre or what a user focuses on when watching a trailer. This could also trace back to what the user likes watching.

## Future Steps

1. Different Trailers

Because the number of genres were limited, it was difficult to analyze the brainwaves of those who did not like mainstream movies. In order to account for a wider audience, it is necessary to include more genres as well as increase the number of trailers watched by each person to increase the amount of data that can be used for machine learning.

1. Updated Questionnaire

To account for the additional genres, it may be necessary to include additional items in the questionnaire such as sad or happy. For specific genres, such as horror, it would be helpful if people were also able to evaluate how scary the movie will be based on the trailer.

1. Analysis Methods

For this experiment, only random forest was used. Its average accuracy remained around 70%; different machine learning methods may provide higher accuracy. This could thereby lead to a better recommendation system in the future.

1. More Data

Due to time constraints, only 12 subjects participated in the experiment. With more data, Random Forest may achieve a higher test accuracy. In addition, more relationships between biosignals and the questionnaire results may be found, leading to a more accurate prediction of a user’s preferences.

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# List of Publications

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| Classification and Prediction of a Trailer Viewer’s Emotion by Using Bio-signals | March, 2020 | Institute of Electronics, Information and Communication Engineers General Conference 2020 | Connie ZHOU,  Marika ARIMOTO, Mutsumi SUGANUMA, Wataru KAMEYAMA |