

Emotions

Project Description

1. Introduction

The objective of this group project is to find experimentally the structure of the subjective perception of emotions from facial expressions.

- Each group is provided with a dataset with 24 images representing one of the 8 prototypical emotions (8 emotions x 3 repetitions).
- Each group is responsible to compute a 24x24 similarity matrix by ranking from 0 to 9 how similar are two emotions. Thus, the similarity matrix will contain the pairwise comparison among all the images, 276 pairwise comparisons.
- Additionally, each group will compute a consistency matrix that will verify the reliability of their annotations, 24 randomly chosen pairwise comparisons.
- 300 pairwise comparisons in total.

Lab3 – session 1:

Annotators should rank the images similarity following this criterion:

- 0-1 if the emotions are not similar at all.
- 2-3 if the emotions are not very similar.
- 4-5 if the emotions are more or less similar.
- 6-7 if the emotions are quite similar.
- 8-9 if the emotions are the same.
- Easy to annotate using the provided materials (*generate_similarity.m*)

Deadline similarity scores (30-Jan-2024).

Lab3 – session 2:

- Each group must analyze the reliability of their annotations.
Each team must compare their consistency matrix with a random annotator using some criteria or metric (i.e. mean absolute difference) for this task.

- Each group should compute the dissimilarity matrix.

It is more intuitive to annotate how similar are two emotions than the opposite. However, to find the structure of the subjective perception of emotions, we will analyze the dissimilarity between emotions. Thus, a dissimilarity matrix will mark with zero two facial expressions who represent the same emotion (i.e. opposite to the similarity one).

In order to convert the similarity, C , to a dissimilarity matrix, D . The standard way to do so is as follows:

$$d_{ij} = \sqrt{c_{ii} - 2c_{ij} + c_{jj}}$$

where c_{ij} are the similarity scores between pictures i and j , and d_{ij} are the resulting distances between pictures i and j .

- Each group have to extract the first two bases from the dissimilarity matrix using *multi-dimensional scaling (MDS)*. To check your implementation, you can use `cmdscale()` MATLAB function.

Team work

This project must be carried out in teams. Each team will have at least 2 members and at most 3 members. Each team member is expected to understand all the work that the team performs, so that he/she would be able to answer any question about the presented work if requested by the teacher(s). Failure to meet this requirement will result in a sanction that will be applied equally to all team members.

2. Project submission

For a project to be complete, each team must submit the following material strictly before the deadline (06-Feb-2024, 23:59 CET):

- The code and a report describing the work that was done. The report must include:
 - An introduction motivating the lab.
 - A brief description of the experimental procedure, including the experimental setup and the description of the procedure used to determine the extracted bases.
 - Visual analysis of the results, explaining (if possible) the interpretation that could be assigned to each basis and comparing it to the traditional valence and arousal representation of emotions.

The report will be in **.doc, .docx or .pdf** format and will be limited to a maximum of 4 pages, including figures, plus up to one additional page for references. All pages will have margins of at least 1.5cm (top, bottom and both sides) and the font will be either Arial or Times New Roman no smaller than 11 pts.

Marks

The project will be marked with the following criteria:

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| ○ Introduction | 1 pts |
| ○ Correct explanation of the procedure | 2 pts |
| ○ Analysis of the results | 4.5 pts |
| ○ Overall presentation and clarity of the exposition | 1.5 pts |
| ○ Literature review with relevant references | 1 pts |