

MMI Face Database

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Abstract

The automatic recognition of human facial expressions is an interesting research area in AI with a growing number of projects and researchers. In spite of repeated references to the need for a reference set of images that could provide a basis for benchmarking various techniques in automatic facial expression analysis, a readily accessible and complete enough database of face images does not exist yet. This lack represented our main incentive to develop a web-based, easily accessible, and easily searchable repository of still and motion face images.

1. Introduction

Automatic recognition of human facial expressions has recently gained an increased interest from Artificial Intelligence researchers. Numerous efforts have been made to enable machine recognition of facial expressions. For exhaustive overviews of existing techniques, readers are referred to [1] and [2].

Validation studies of automated analyzers of human facial expression address the question whether the interpretations of these automatons equal those given by human observers. This testing of automated facial expression analyzers involves obtaining a set of test material coded by human observers in terms of shown emotions and/or in terms of displayed facial muscle activation (facial Action Units (Aus)). In order to enable proper testing and comparison of different automated analyzers, this test data should be easily accessible and as complete as possible in terms of expressions shown and variation of the persons displaying the facial expression (at the least it should contain still and motion images of six basic emotional expressions and of each facial muscle activated individually). Nevertheless, none of the currently available databases of face images fulfills these requirements [1]. This motivated our effort to develop a database that will comply with those demands.

2. Database Criteria

The following criteria have been defined for our MMI-Face-DB. It should be easily accessible, extendible, manageable, user-friendly, accompanied with

online help files, equipped with different search criteria, enabled with a preview for each and every search request, and because of the accessibility it should be secure. The database should contain still images and videos displaying both the six basic emotional displays and the individual activations of each of 44 existing facial muscles. The database images should represent a number of demographic variables including ethnic background, gender, and age. Because of the large number of variables involved here (six emotions, combinations of 44 Aus, various human aspects) it is important that the database is easily searchable.

3. Technology Used

To build the database, we used JavaScript, Macromedia Flash, MySQL, PHP, and Apache HTTP server. The use of JavaScript enabled us to create dynamic pages. Macromedia Flash¹ was used to build a Rich Internet Applications, providing some extra animation features. MySQL² was chosen as the database server because it is available for free, it is platform independent, fast and robust, and it is well documented. PHP³ was used because it is an open source platform that works extremely well with MySQL database server. Finally, we use Apache HTTP Server because it is an open source application, secure, efficient and extendible, and is well documented.

4. Demonstration Description

In order to show how the MMI-Face-DB works, we need two computers, preferably with a fast Internet connectio. The participants will be able to explore our database (± 200 still images and ± 800 videos) and to try some of it's functions, such as searching, downloading or viewing parts of the database content.

References

[1] M.Pantic, L.J.M. Rothkrantz, "Toward an Affect-Sensitive Multimodal Human-Computer Interaction", IEEE proceedings vol. 91, no. 9, pp. 1370-1390, 2003.

[2] Y. Tian, et al., "Recognizing action units for facial expression analysis", IEEE, vol. 23, no. 2, pp. 97-115, 2001

¹ For further information on this programme please visit <http://www.macromedia.com>

² For further information on this programme please visit <http://www.mysql.com>

³ For further information on this programme please visit <http://www.php.net>