

Video Quality Assessment System

Instructions

In this project github repository there is a Visual Studio Project made using the following setup: Windows, Visual Studio community edition 2015, openFrameworks 0.9.3 and OpenCV 3.2.0 + contrib modules.

One can either compile it from source or just copy and paste the binaries from the bin folder to any place on a windows x64 machine and then, run the executable video-assessment.exe. The fastest way to solve missing video codecs error is to install K-lite codec pack 12.3.0.

When starting the application, as we can see in [image 1](#), the gui present us with the thumbnails of all the videos in the repository. In this case is the demonstration repository made with one second of each of the 700 videos of the CETH-ITI-VAQ700 dataset.

Using the Interface

Retrieved videos vs Total videos indicator

Scroll bar

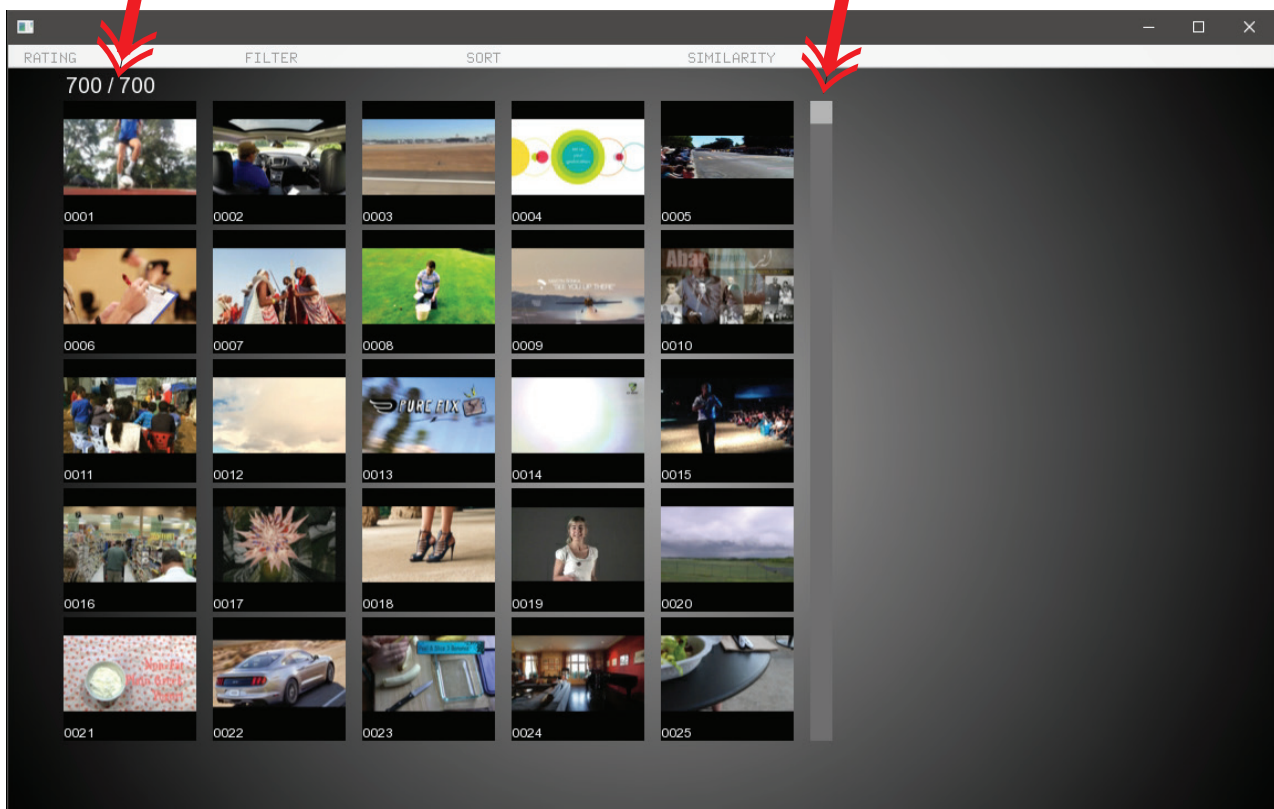


image 1 - Starting screen

When one of the thumbnails is clicked, as we can see in [image 2](#), the gui marks the selected video with a green border and present us in its right side with a metadata panel and below it a preview panel with the selected video. Pressing the spacebar toggles between preview play and stop.

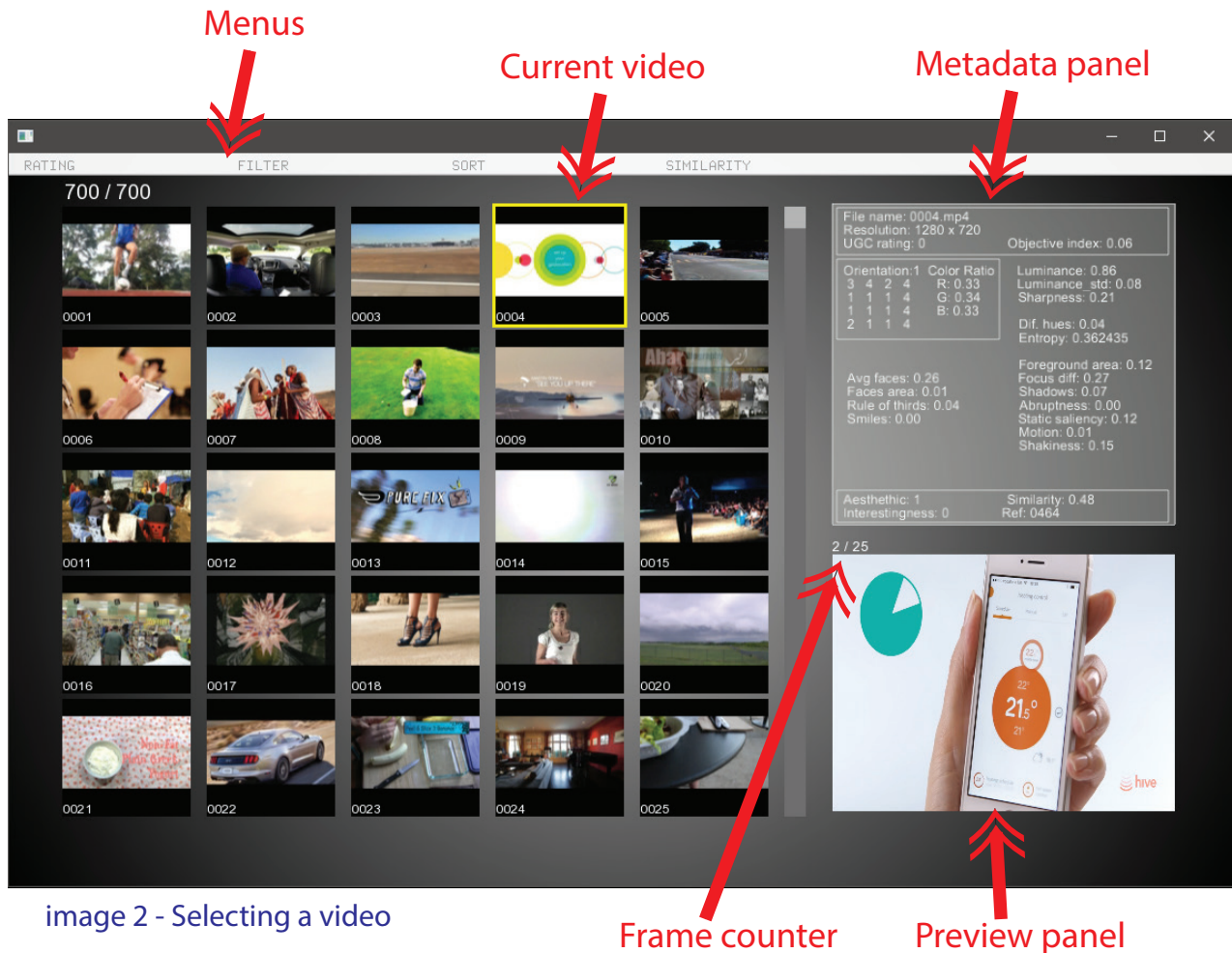


image 2 - Selecting a video

There are 4 available menu tabs:

RATING - With the rating tab the user can assign a rating from 0 to 5 to some videos and afterwards filter or sort by this rating.

FILTER 1 - In the filter tab 1 the user can filter using the basic features

FILTER 2 - In the filter tab 2 are grouped advanced features

SORT - In this tab we can sort the videos by more than 20 different features.

SIMILARITY - Using the similarity menu the user can generate a similarity index based on color, edge orientation, entropy or motion. This feature uses the current selected video as reference for the indexing operation. After generation of the index the user can sort by similarity using the sort tab.

Adding a new video repository

The extractor module accepts 3 types of video file extensions:

- MP4
- MTS
- MOV

To add a new repository of videos:

- 1 - Delete all files in "data/xml" folder
- 2 - Delete all files in "data/thumbnails/videos" folder (optional step)
- 3 - Delete all files in "data/files" folder
- 4 - Put new video files in "data/files" folder
- 5 - Start application

Example:

After deleting all files in "data/xml" folder we copied 5 videos to "data/files" folder (image 3)
Running the application renders the output visible in image 4

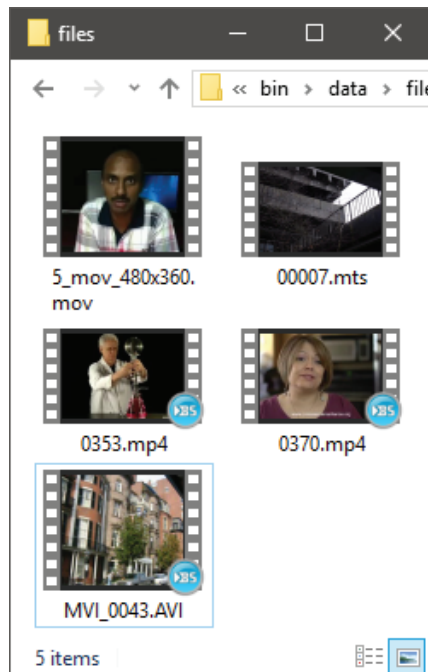


image 3 - New videos

```
Command Prompt - video-assessment

C:\of_v0.9.3_vs_release\apps\myApps\graphic-interface - extractor-suite - g
-assessment\bin>video-assessment
New Panel object
Unlocked!
[*] Cognitus visual feature extraction module
[*] Video input folder: data/files/

[M] dataset items: 700
[M] features: 19
[M] [19 x 650] feature vector
[M] [1 x 650] labels vector
[M] Aesthetic Classifier generated!

[M] dataset items: 1200
[M] features: 19
[M] [19 x 1100] feature vector
[M] [1 x 1100] labels vector
[M] Interestingness Classifier generated!

[!] Classifiers created in (ms): 13677
[!] number of files to process: 5

[1] 29.97fps 1920x1080 length:362 SF:1
[P] processed frames: 361
[M] aesthetics: 0 interestingness: 0
[!] File 00007.mts processed in : 49953 ms

[2] 29.97fps 640x360 length:2255 SF:1
[P] processed frames: 2255
[M] aesthetics: 1 interestingness: 1
[!] File 0353.mp4 processed in : 276398 ms

[3] 23.976fps 640x360 length:1441 SF:1
[P] processed frames: 1441
[M] aesthetics: 1 interestingness: 1
[!] File 0370.mp4 processed in : 183708 ms

[4] 14.8247fps 480x360 length:222 SF:1
[P] processed frames: 218
[M] aesthetics: 1 interestingness: 1
[!] File 5_mov_480x360.mov processed in : 26906 ms

[5] 20fps 320x240 length:189 SF:1
[P] processed frames: 189
[M] aesthetics: 0 interestingness: 0
[!] File MVI_0043.AVI processed in : 24138 ms

thumbnail created for 00007.mts
xml file for 00007 generated
thumbnail created for 0353.mp4
xml file for 0353 generated
thumbnail created for 0370.mp4
xml file for 0370 generated
thumbnail created for 5_mov_480x360.mov
xml file for 5_mov_480x360 generated
thumbnail created for MVI_0043.AVI
xml file for MVI_0043 generated
[notice ] ofxFontStash: loaded font 'arial.ttf' in texture (1024 x 1024)
```

image 4 - Extraction process

After the feature extraction process the graphical interface starts up (image 5)

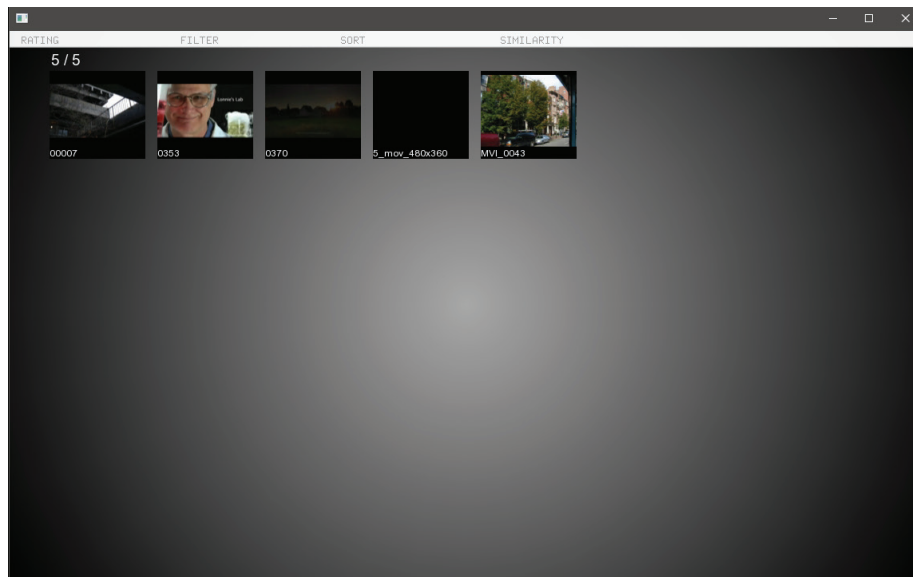


image 5 - Graphical interface

Changing extraction setup

It is possible to configure the feature extraction using the extractor_config.xml file, below is the content of this file where we can see the default values:

```
<CONFIG>
  <SAMPLING_FACTOR>1</SAMPLING_FACTOR>
  <EDGE_HIST>1</EDGE_HIST>
  <QUIET>1</QUIET>
  <RESIZE>1</RESIZE>
</CONFIG>
```

The possible values for each configurable variable are:

SAMPLING_FACTOR = 1 - INF

Increasing the sampling factor will skip frames during the extraction process, making it much faster to compute. Extracting our features using a factor of 10 means that the time of the extraction process will be 1/10 of using a factor of 1. There is a trade-off: background subtraction and optical flow features will not be extracted.

EDGE_HIST = 0, 1

Turning off edge histogram will decrease slightly computation time.

QUIET = 0, 1

Turning off quiet mode will increase console feed-back from extraction process.

RESIZE = 1, 2, 3

The extraction process is done on a resized version of the video frames, available options are:

- 1 - 320 x 240
- 2 - 480 x 360
- 3 - 640 x 480