
Technical Documentation

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TABLE OF CONTENTS

| | | |
|------------|--------------------------------------|-----------|
| I | The Emotions Tool | 1 |
| 1 | Quick Start | 3 |
| 1.1 | Installation | 3 |
| 1.1.1 | From source with CMake | 3 |
| 1.2 | Usage | 3 |
| 2 | Code Documentation | 5 |
| 2.1 | The Entry Point | 5 |
| 2.2 | The CLI | 5 |
| 2.3 | The Exit Codes | 6 |
| 2.4 | The Data URI | 6 |
| 2.5 | The Base64 Utilities | 7 |
| II | The Browser Extension | 9 |
| 3 | The Browser Extension | 11 |
| III | The Server | 13 |
| 4 | Introduction | 15 |
| 4.1 | Folder Structure | 15 |
| 5 | The Data Processor | 17 |
| 6 | The Survey | 19 |
| IV | The Data Analyzer | 21 |
| 7 | Quick Start | 23 |
| 7.1 | Installation | 23 |
| 7.2 | Usage | 23 |
| 7.2.1 | The Command Line Interface | 23 |
| | Positional Arguments | 24 |
| | Optional Arguments | 24 |
| 7.2.2 | The Code API | 24 |
| 8 | Code Documentation | 25 |

| | | |
|--------------|---|-----------|
| 8.1 | Module: cli | 25 |
| 8.2 | Module: data | 25 |
| 8.3 | Module: plotting | 25 |
| V | License | 27 |
| 9 | GNU Free Documentation License | 31 |
| 9.1 | 0. Preamble | 31 |
| 9.2 | 1. Applicability and Definitions | 31 |
| 9.3 | 2. Verbatim Copying | 33 |
| 9.4 | 3. Copying in Quantity | 33 |
| 9.5 | 4. Modifications | 33 |
| 9.6 | 5. Combining Documents | 35 |
| 9.7 | 6. Collections of Documents | 35 |
| 9.8 | 7. Aggregation with Independent Works | 35 |
| 9.9 | 8. Translation | 36 |
| 9.10 | 9. Termination | 36 |
| 9.11 | 10. Future Revisions of this License | 36 |
| 9.12 | 11. Relicensing | 37 |
| | 9.12.1 ADDENDUM: How to use this License for your documents | 37 |
| 10 | GNU General Public License | 39 |
| 10.1 | 0. Definitions | 40 |
| 10.2 | 1. Source Code | 40 |
| 10.3 | 2. Basic Permissions | 41 |
| 10.4 | 3. Protecting Users' Legal Rights From Anti-Circumvention Law | 41 |
| 10.5 | 4. Conveying Verbatim Copies | 42 |
| 10.6 | 5. Conveying Modified Source Versions | 42 |
| 10.7 | 6. Conveying Non-Source Forms | 42 |
| 10.8 | 7. Additional Terms | 44 |
| 10.9 | 8. Termination | 45 |
| 10.10 | 9. Acceptance Not Required for Having Copies | 45 |
| 10.11 | 10. Automatic Licensing of Downstream Recipients | 45 |
| 10.12 | 11. Patents | 46 |
| 10.13 | 12. No Surrender of Others' Freedom | 47 |
| 10.14 | 13. Use with the GNU Affero General Public License | 47 |
| 10.15 | 14. Revised Versions of this License | 47 |
| 10.16 | 15. Disclaimer of Warranty | 47 |
| 10.17 | 16. Limitation of Liability | 48 |
| 10.18 | 17. Interpretation of Sections 15 and 16 | 48 |
| | 10.18.1 How to Apply These Terms to Your New Programs | 48 |
| Index | | 51 |

Part I

The Emotions Tool

QUICK START

1.1 Installation

To use the tool, download its compiled binary from the repository and execute it from a console.

Important: The tool has been tested on **Ubuntu Xenial 16.04**.

The **Affdex SDK** is only available on Windows and Ubuntu Xenial 16.04, so compatibility with other Operative Systems is not guaranteed.

1.1.1 From source with CMake

Clone and open the [GitHub repository](#) in a console, using the following commands:

```
git clone https://github.com/espositoandrea/Bachelor-Thesis.git
cd Bachelor-Thesis
```

Open the directory containing the tool's source code:

```
cd emotions
```

Finally, create and compile the CMakeProject:

```
mkdir bin
cd bin
cmake -G "CodeBlocks - Unix Makefiles" ..
make
```

1.2 Usage

Important: To use the tool you must have the **Affdex SDK** installed on your machine. Then, you have to add `/path/to/affdex-sdk/lib` to the variable `$LD_LIBRARY_PATH` (on Ubuntu).

```
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/path/to/affdex-sdk/lib/
```

The tool will then search, in its folder, for the folder `lib/affdex-sdk/data/` (that has to contain the data used by Affdex).

The tool can be used through CLI (or executed by another script).

```
./emotions [<option>...] IMAGE...  
./emotions [<option>...] --file FILE
```

Where IMAGE is a *data URI*. The available options are:

- h, --help** Get the help message
- f FILE, --file FILE** The file containing the images to be analyzed (as a data URI)

CODE DOCUMENTATION

2.1 The Entry Point

The main file.

This file is the main file of the tool.

Author Andrea Esposito <github.com/espositoandrea>

Functions

int **main** (int *argc*, char ***argv*)

The main entry point.

This is the entry point of the tool.

Return An *exit code* based on the execution.

Parameters

- *argc*: The length of *argv*.
- *argv*: The array of arguments given through the command line.

2.2 The CLI

exit_codes **setup_options** (int *argc*, char ***argv*, std::vector<std::string> &*images*)

Set up the tool's options and arguments.

This function is responsible of the CLI API of the tool. It sets and handles the available options and arguments.

Return An *exit code*:

- *exit_codes::OK* If the given arguments are valid and no errors occurred.
- *exit_codes::HALT* If the given arguments are valid but the argument combination stops the execution.
- *exit_codes::ARGUMENT_ERROR* If the given arguments are invalid
- *exit_codes::UNKNOWN_ARGUMENT_ERROR* If an unknown error occurred.

Parameters

- `argc`: The length of `argv`.
- `argv`: The array of arguments passed via CLI.
- `images`: A variable that will contain the images passed through the CLI API.

2.3 The Exit Codes

enum `exit_codes`

A collection of all the exit codes of the tool.

This enum contains all the (expected) exit codes of the tool.

Values:

OK = 0

The tool exited with no error completing its tasks.

HALT = 1

The tool exited with no error, but without completing its tasks.

ARGUMENT_ERROR = 2

The tool exited due to errors in the given arguments.

UNKNOWN_ARGUMENT_ERROR = 3

The tool exited due to unknown errors while parsing the arguments.

2.4 The Data URI

class `data_uri`

A utility class to handle data URIs.

This class represents a data URI. A data URI is defined by [MDN](#) as a string with the following syntax: `data:[<mediatype>][;<base64>],<data>`.

Public Functions

`data_uri` (**`const`** `std::string &s`)

The class constructor.

This constructor creates a *`data_uri`* from a string.

Parameters

- `s`: The string representing the data uri.

Exceptions

- *`data_uri::string_not_uri`*: if `s` is not a valid data URI.

`std::string` **`get_type`** () **`const`**

Get the media type.

This function returns the media type of the data URI.

Return The media type (`<mediatype>` in `data:<mediatype>;base64,<data>`).

`std::string get_data () const`

Get the data.

This function returns the data contained in the data URI.

Return The data (`<data>` in `data:<mediatype>;base64,<data>`).

`std::string get_uri () const`

Get the URI.

This function returns the entire URI as a string.

Return The URI as a string.

Public Static Functions

`bool is_data_uri (const std::string &s)`

Check if a string is a data URI.

The function checks if a string is in the format `data:<mediatype>;base64,<data>`.

Return True if `s` is a data URI, false otherwise.

Parameters

- `s`: The string to be checked

`class string_not_uri : public exception`

An exception raised if a string is not an URI.

This exception is thrown if a string, assumed to be one, is not a data URI.

2.5 The Base64 Utilities

`namespace base64`

Namespace for dealing with *base64* strings.

This namespace contains utilities to deal with *base64* strings.

Functions

`std::string encode (const std::string &s)`

Encode a string to *base64*.

This function encodes a string to a *base64* string.

Return The encoded string.

Parameters

- `s`: The string to be encoded.

`std::string encode (unsigned char const *s, unsigned int len)`

Encode a string to *base64*.

This function encodes a string to a *base64* string.

Return The encoded string.

Parameters

- `s`: The string to be encoded.
- `len`: The length of the string `s`.

`std::string decode (std::string const &s)`

Decode a *base64* string.

This function decodes a *base64* string to a binary string.

Return The decoded string.

Parameters

- `s`: The string to be decoded.

Part II

The Browser Extension

THE BROWSER EXTENSION

Part III

The Server

INTRODUCTION

4.1 Folder Structure

The `server/` folder contains all the source code of the developed server. Its structure is the following (all described folders are subfolders of `server/`).

views/ This folder contains all the views developed for the server.

views/layouts/ This folder contains the layouts used to define the views.

survey/ This folder contains all the required data for the survey.

assets/ This folder contains all the static files that will be served without any modification.

assets/images/ A folder that contains all the images and illustrations used.

assets/js/ A folder that contains all the external JavaScript files (needed by the extension).

assets/style/ A folder that contains all the stylesheets of the server (written in [SASS](#)).

THE DATA PROCESSOR

THE SURVEY

The survey is generated using the exported object defined in the module `survey-data.js`. Here is documented the structure of that object.

class Survey()

The survey configuration object.

Arguments

- **introduction** (*string*) – The introduction to the survey. Treated as raw HTML.
- **sections** (*Array.<Section>*) – The survey's sections.

class Section()

A section of the survey.

Arguments

- **title** (*string*) – The section's title.
- **questions** (*Array.<Question>*) – The section's questions.

class Question()

A question of the survey. @extends BasicQuestion.

Arguments

- **type** (*string*) – The type of question.
- **rules** (*Object*) – Various additional rules. Can be any HTML attribute accepted by the current input type.
- **placeholder** (*string*) – The input placeholder.
- **choices** (*Array.<string>*) – A list of choices. Used only if type is 'choice'.
- **question** (*string|Array.<BasicQuestion>*) – If it's a string, the same as BasicQuestion.question. If an array of BasicQuestion, a list of questions used if type is 'likert'.

class BasicQuestion()

A basic question of the survey. This class contains all the required field of a question.

Arguments

- **question** (*string*) – The question that will be asked to the user.
- **name** (*string*) – The name of the GET/POST parameter.

- **required** (*boolean*) – Whether or not the input is required.

Part IV

The Data Analyzer

QUICK START

7.1 Installation

To install the tool, download the tool's folder and execute the following commands (replace `/path/to/analyzer/` with the path to the downloaded folder).

Listing 1: How to install the tool

```
cd /path/to/analyzer
python3 -m pip install .
```

7.2 Usage

7.2.1 The Command Line Interface

Once installed you can use this tool from your terminal using the command `analyzer`.

Listing 2: The tool's CLI

```
analyzer [-h] [--version] [-v] file users
```

Note: You can execute the tool as a Python module, without installing it first. Download the tool's folder and execute the following commands (replace `/path/to/analyzer/` with the path to the downloaded folder).

Listing 3: How to execute the tool as a Python module

```
cd /path/to/analyzer
python3 -m analyzer --help
```

Process the JSON file

Positional Arguments

file The file

users A JSON file containing the users

Optional Arguments

| | |
|----------------------|-------------------------------------|
| -h, --help | show this help message and exit |
| --version | output version information and exit |
| -v, --verbose | increase output verbosity |

7.2.2 The Code API

Once installed you can use the tool as a Python module. Read the [code documentation](#) for more information on the API.

CODE DOCUMENTATION

8.1 Module: cli

8.2 Module: data

8.3 Module: plotting

Part V

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A

ARGUMENT_ERROR (C++ *enumerator*), 6

B

base64 (C++ *type*), 7

base64::decode (C++ *function*), 8

base64::encode (C++ *function*), 7, 8

BasicQuestion() (*class*), 19

D

data_uri (C++ *class*), 6

data_uri::data_uri (C++ *function*), 6

data_uri::get_data (C++ *function*), 7

data_uri::get_type (C++ *function*), 6

data_uri::get_uri (C++ *function*), 7

data_uri::is_data_uri (C++ *function*), 7

data_uri::string_not_uri (C++ *class*),
7

E

exit_codes (C++ *enum*), 6

H

HALT (C++ *enumerator*), 6

M

main (C++ *function*), 5

O

OK (C++ *enumerator*), 6

Q

Question() (*class*), 19

S

Section() (*class*), 19

setup_options (C++ *function*), 5

Survey() (*class*), 19

U

UNKNOWN_ARGUMENT_ERROR (C++ *enumera-*
tor), 6