Morphing Project Editor

v1.1

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# Introduction

With the Morphing Animation Editor application, you can create morphing animations using any images you want to morph one image into another through a seamless transition.

## Overview

First, drag the images that you want to morph to the table in the main window.

*If you put the images in a directory derived from the directory where you save the Morphing project, then the relative filename of the image will be taken from where the project is saved.*

*This is useful in the case that you want to move the project to another location or transfer it to another computer.*

*If the images are in a different location, then the full file names will be saved. You will not be able to move the images or transfer them to another device if they are not in the same location.*

Next, choose a master image.

*It's recommended to not change the master image after initially choosing one. If you decide to change the master image, the vertices could end up in a different position and change the triangulation.*

Choose the area of the master image that you want to morph, as explained in this point: ***3.4*** - ***Define Morphing Frame Window***

Choose the morphing area in the rest of the images.

*The aspect ratio used is the aspect ratio of the master image’s morphing frame.*

*You can change the morphing area of an image at any time by moving or resizing it.* ***3.4*** - ***Define Morphing Frame Window***

You should then detect the faces and select the detected face from each of the images, manually adjusting the points of the detected face as needed.

***3.3.2.3.3*** - ***Pop-up menu*** and ***3.3.2.1*** - ***Face selection layer***.(Face detection and selection)

These adjustments are saved and will be applied automatically every time you use the face in your projects.

*Detecting faces allows you to use some of the new features of this version:*

* *Insert all 68 detected vertices at once* ***3.3.2.3.3*** - ***Pop-up menu***.
* *Automatically reposition the vertices of the triangle mesh based on the 68 detected vertices of the master image and the currently selected image (pop-up menu option).*

***3.3.2.3.3*** - ***Pop-up menu*** *(automatically align the vertices of the master mesh in the currently selected image).*

* *Make use of the new "FACE\_DETECTION" transition between two images in an animation.*

Then, return to the master image and insert the vertices of the mesh, as explained in this point: ***3.3.2*** - ***Editing panel***

The vertices are inserted in all of the images, mapping each new vertex in the triangulation of each image.

*For optimal results, when choosing the vertices, delineate the specific areas that you want the morphing to take place (i.e. mouth, nose, hair, eyes and surroundings, etc.).*

The vertices will most likely not be in the same position across the different images (for example, the mouth will be in a different position in each image). Therefore, once you have defined the vertices of the master image, you will then need to move each vertex to the appropriate position image by image.

*(Note that the vertices will not occupy the same position in different images, since, for example, the mouth will be in a different position in each image.)*

*It is best that the vertices that are on the edges of the Morphing frame do not move from the edge, because if they do, unwanted effects can occur in the morphing effect, such as having an area near the edge that is not colored.*

After detecting and selecting the faces in each image, it’s helpful to use the new menu option: ***3.3.2.3.3*** - ***Pop-up menu*** *(automatically reposition the vertices of the master mesh in the currently selected image).*

Then manually adjust the position in each image.

Here are some useful tools that can help you identify the vertices between images:

* When you click on a point in the image that is inside the Morphing frame, the triangle where you clicked in is selected, and is indicated by an outline in a different color and numbering its vertices.

If you don't click on another triangle and switch images, the same selected triangle is highlighted.

* You can fade to the master image at any time: the current image is faded to the master image at the percentage you choose with a scroll bar. This tool overlays the master image on the current image, which you can then use to try to guess which zone corresponds to which zone.

When you change the image or the zoom factor, or if you press escape, the fade disappears.

You can add new vertices at any time; however, it’s better to do so first in the master image, and then reposition them in the other images.

You can also delete the vertices at any time (deleting a vertex in one image will subsequently delete the vertex in all the other images as well).

You can move the vertices separately to each image (i.e., if you move a vertex in one image, that vertex does not move in the other images).*When moving the vertices of the master image, you should try not to move them too far away from their original position, as this could change the triangulation, causing the triangles to overlap and the vertices of the other images to be in the wrong position.*

When you have defined all the vertices and want to duplicate an image to put it in a different morphing position, you can clone the image with the same vertices. ***3.1.2.2*** - ***Row pop-up menu***

When you have carefully placed the vertices in each image, you can launch a morphing animation. ***3.2.3*** - ***Tools menu***

You can save the Morphing project at any time.

*The data saved for each image is:*

* *The name of the image (which cannot be changed).*
* *The name of the image (that is assigned automatically).*
* *The Morphing frame.*
* *The coordinates of the vertices*
* *If the image is a master image or not.*

When you have finished a project and don't need to make any more changes, you can open the project with the Video Maker application and create a video of the morphing animation.

**Overview of Version 1.1**

This new version comes with a free face detection library (dlib-68 face landmarks) which produced very good results during its development.

When you upload an image to the library, it will calculate 68 vertices for each face detected in the image.

The application saves the vertices of each image processed in a main project file, allowing you to fine-tune the detected vertices, which will be applied whenever you use the image again in a project.

This new feature allows you to make triangle meshes and insert the 68 detected points at once with a click.

In order for this to work, you need to have detected and selected the detected face in each of the images of the project first.

For better results, create more sophisticated meshes by adding new vertices (they should ideally be inserted from the master image first) and then adjusting them in each image.

When you add a new image and detect and select one of the faces in the image to morph (and do the same with the master image), the application will take the reference of these 68 points in both images. The option to move the vertices of the mesh in the new image based on these reference points is enabled in the pop-up menu, making the work much easier.

This new version has two morphing effects that can be independently customized for each transition that takes place between two images.

* The NORMAL morphing, based on the triangle mesh, is the same kind of transition used in the previous version of the application.
* The FACE\_DETECTION morphing is based on an 88-vertices mesh rather than the triangle mesh. These vertices are automatically taken from the 68 points generated from running the face detection function. In order to use this transition, first detect and select the faces in each image of the project.

This type of transition is made only with the triangles of the mesh that fall within the 68 detected points, while the rest of the image is in black.

Keep in mind that the morphing mesh used in each transition depends on how the transition is set up in both the current image and the following image. Any combination of transitions is valid.

Table Animation transition type table

|  |  |  |
| --- | --- | --- |
| **Current image transition** | **Next image transition** | **Current transition effect** |
| NORMAL | NORMAL | Normal morphing, using the designed triangle mesh. No areas are in black. |
| NORMAL | FACE\_DETECTION | Automatic mesh comprised of 88 vertices. Fades to black outside of the detected vertices. |
| FACE\_DETECTION | NORMAL | Automatic mesh comprised of 88 vertices. Fades from black to color outside of the area of the detected vertices. |
| FACE\_DETECTION | FACE\_DETECTION | Automatic mesh comprised of 88 vertices. Area outside of the detected vertices is in black. |

## Visual appearance of the screens

### Main screen

Main screen appearance:

Interfaz de usuario gráfica, Texto, Aplicación, Correo electrónico

Descripción generada automáticamente

The screen has the following features:

* Main menu on the top line
* Top row:
  + Text editor: Name of Morphing project.
  + Open, Save, and Save As Morphing Project icons.
  + Text editor: name of the Morphing project file.
* Table

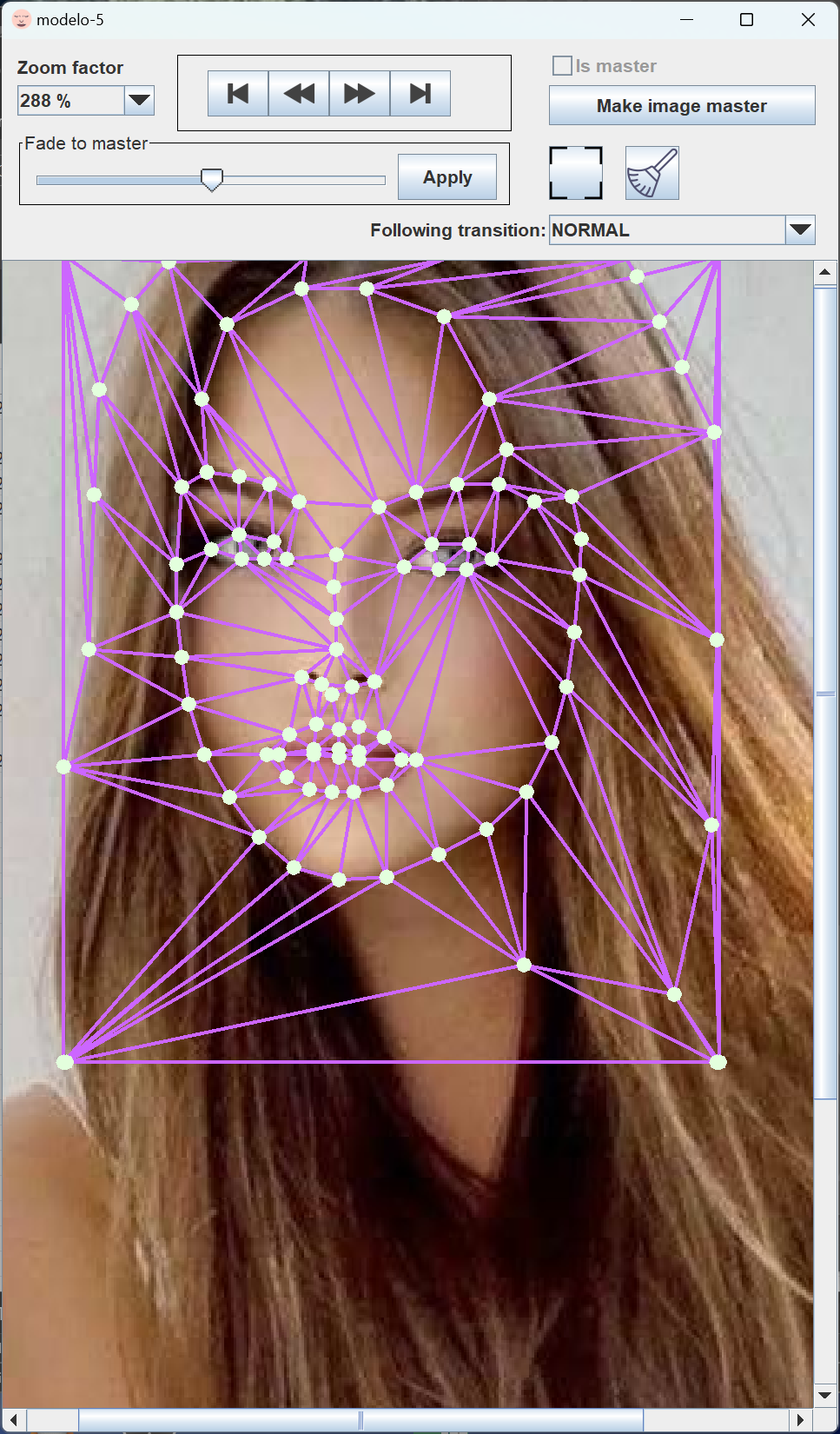
Table of images

* Bottom part:

This is where the Morphing simulation is displayed when a simulation is launched.

### Editing window:

Editing window appearance:



The screen has the following options:

* Top control panel:
  + Drop-down: Zoom factor
  + Image browser
  + Master:
    - Indicates if the current image is the master image.
    - Button that makes this image the master.
  + Fade to master:
    - Scroll bar with the master image percentage.
    - Apply button: Fades to the master image by the percentage indicated by the scroll bar.
  + Button to open the Morphing framing window. ***3.4*** - ***Define Morphing Frame***
  + Button to delete all the vertices of the triangulation.
  + Drop-down: Next transition.
    - NORMAL: Uses the triangle mesh.
    - FACE\_DETECTION: Uses the detected triangle mesh. The triangles outside the face are faded to black.

The next transition depends on the settings of the current transition (from the currently selected image to the next), and the next transition (from the next image to the following one).

Consult this table to see the result of all transition combinations. ***Table 1 Animation transition type table***.

* Lower content panel.
  + Image:

Image with its triangulation.

# Quick Start

## Requirements

To run the application, Java Runtime Environment version 8 or higher needs to be installed.

This allows you to open the .jar file located in the ./\_binary/ folder.

The directory where the Java application is located must be in the PATH environment variable.

## Quick Start

The instructions for two different operating systems are detailed:

### Windows (64 bits)

### Morphing editor

To start using the application, follow the steps below:

* Start the program by double-clicking on the executable file in: …/\_binary/morphing-gui-v1.1.exe

### Morphing video creator

To start using the application, follow the steps below:

* Start the program by double-clicking on the executable file in: …/\_binary/morphing-video-builder-v1.1.exe

### Linux and Mac

### Morphing editor

To start using the application, follow the steps below:

* Open a commands window.
* Change the directory to …/\_binary
* Run the script: ./unixExecuteMorphingEditor.sh

### Morphing video creator

To start using the application, follow the steps below:

* Open a commands window.
* Change the directory to …/\_binary
* Run the script: ./unixExecuteMorphingVideoBuilder.sh

# User interface

In this chapter you will learn how to use the main window panes.

## Main window

The main window looks like this:

Interfaz de usuario gráfica, Texto, Aplicación, Correo electrónico

Descripción generada automáticamente

### Top panel options

The top panel has various options:

* Text Editor (Top left). Change the name of the current project.
* “Open Project” button. To open a new project saved on the computer's hard drive.
* “Save Project” button. To save current project in the location specified in the Text Editor: project file name.
* “Save Project As...” button. To save the current project with a different name.
* Text Editor (Top right). View and change the project file name.

### Table of images

A table where you can find the images of the project.

Texto

Descripción generada automáticamente

You can perform the following actions:

* Add images by dragging them from the file browser to the desired position.

*The location of the images cannot be changed.*

*If the images are found in the project file directory, or in a child directory, the relative name from the project directory is used.*

*Since you CANNOT edit the location of the images once added, if the images are in a subdirectory of the project directory, then you can transfer the entire project directory to another device or even to another operating system (projects from Linux operating systems can be opened in Windows, and vice versa).*

*(HOWEVER, IN ORDER TO DO THIS, THE IMAGES MUST BE IN THE MORPHING PROJECT DIRECTORY)*

* Change the image order by selecting the images that you want to move and dragging them to another position in the table.
* Delete images by selecting the images you want to delete and pressing the Delete key, or with the row pop-up menu.
* Change the order of the columns by dragging the heading that you want to another position.
* Resize the width of a column by dragging the right border of the heading until you have the desired size.
* Resize the width of a column to fit the content by double-clicking on the right border of the heading you want to resize.
* Add or remove columns with the heading pop-up menu.
* Reorder columns in ascending or descending order with the heading pop-up menu.

### Heading pop-up menu

When you right-click the heading of the image table, a pop-up menu appears.

Interfaz de usuario gráfica, Texto, Correo electrónico

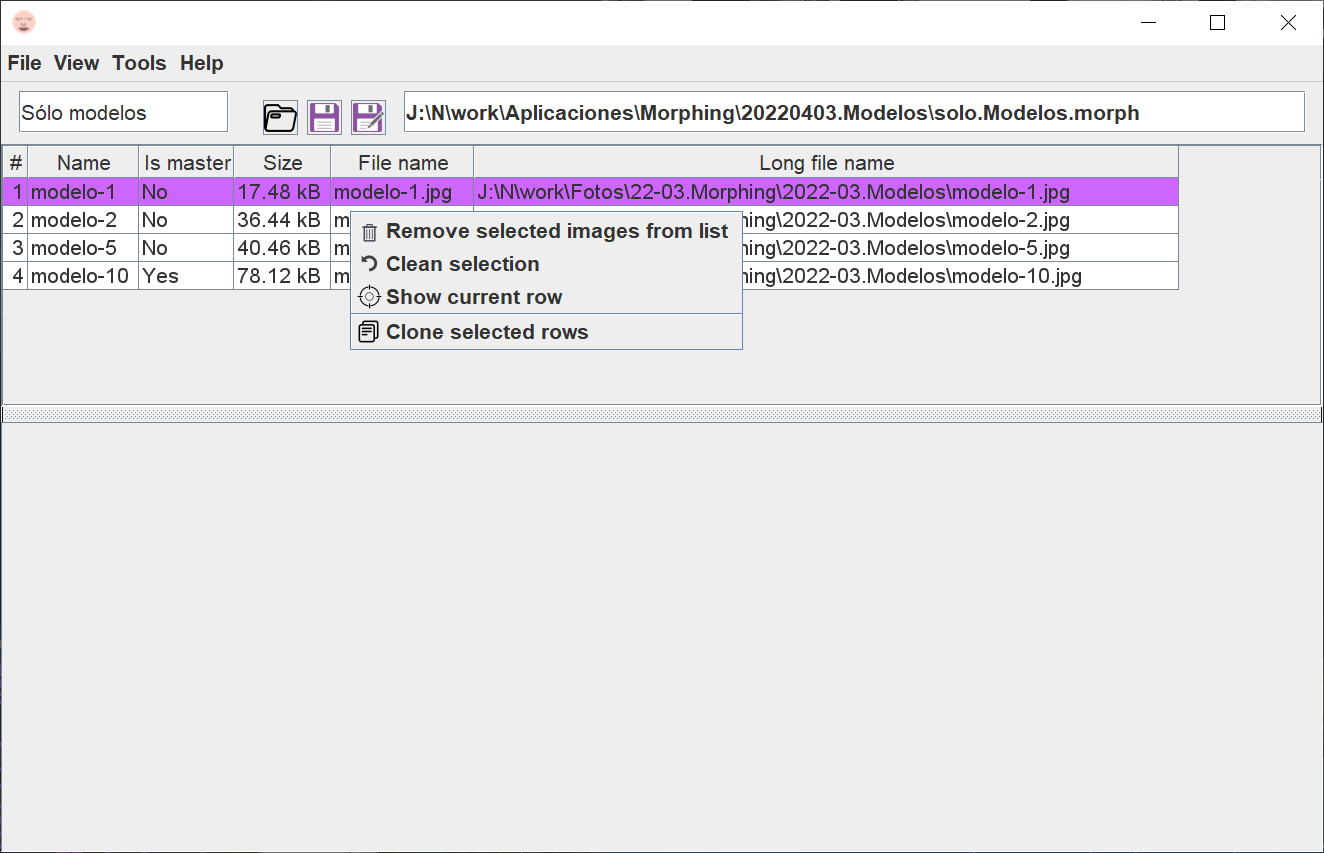
Descripción generada automáticamente

It has the following options:

* Section 1
  + Adjust this column. Fit column width to content.
  + Adjust all of the columns. Fit all column widths to content.
  + Always adjust all columns. Automatically adjust all columns whenever the table content changes.
* Section 2
  + Sort in ascending order by this column. Sort the images in the table in ascending order by the content of the selected column.
  + Sort in descending order by this column. Sort the images in the table in descending order by the content of the selected column.
* Section 3
  + Column names (They can be activated or deactivated)

### Row pop-up menu

When you right-click on a table row, a pop-up menu appears.



It has the following options:

* Delete selected images from the list. When images are selected, you have the option to delete them. A dialog box will pop up asking you to confirm the deletion.
* Clear selection. To unselect all images.
* Show current row. This option is useful for long lists and when you don't know where the current row is located. By clicking this option, you display the current row.
* Clone selected rows. When there are images selected, you can clone the image and its vertices. This is useful in the case that you want to use the same image several times in the morphing image sequence.

### Morphing simulation panel

The lower panel shows the morphing simulation when this option is selected from the Tools menu.

Cara de una persona

Descripción generada automáticamente

## Application menu

The menu is the options bar in the top line of the window.

It has different options:

### File menu

The File menu looks like this:

Interfaz de usuario gráfica, Tabla

Descripción generada automáticamente

This menu has various options:

First section:

* Open Morphing Project. Opens the file selection dialog box, and opens the project you select.
* Save Morphing Project. Save the Morphing project with the original name.
* Save Morphing Project As. Allows you to choose a new file name for the Morphing project and save it with the new name.

Second section:

* Import detected faces. With this option you can import an xml file (for example, previously exported from a different operating system) with the data of all the detected faces.
* Export detected faces. Use this option to export the data from the detected faces to an xml file before importing it with the option “Import detected faces”.

Third section:

* Download imported project from v1.0.

Use this option to download a project that has two versions:

-One created with version v1.0

-The other created with version v1.1. To do so, open the project from version v1.0, adapt it to version v1.1 (face detection), and save it in version v1.1

* Download example Morphing project 1

To download an example project created from scratch with v1.1 (the example project 1 from the demo video).

* Download example Morphing project 2.

To download an example project created from scratch with v1.1. (the example project 2 from the demo video).

Fourth section:

* Exit. Exits the application.

### View menu

The View menu looks like this:

Interfaz de usuario gráfica, Tabla

Descripción generada automáticamente con confianza media

This tab has two options:

* Zoom. Allows you to choose the size of the visual part of the application, with a percentage that indicates the size of the components compared to the normal display of the windows (100%).
* Dark Mode. Change from Dark Mode to Light Mode, or vice versa.

### Tools menu

The Tools menu looks like this:

Interfaz de usuario gráfica, Aplicación, Tabla

Descripción generada automáticamente

This tab has four options:

* Language. When you click on this sub-menu, a list of available languages is displayed. You can change the language of the application.

The following languages are available by default:

* “EN”. English
* “ES”. Spanish.
* “CAT”. Catalan.
* Settings. This option allows you to modify the general application settings. See point: ***3.5-Settings***
* Simulate morphing. Launches a morphing simulation of the current project.
* Cancel simulation. Cancels the morphing simulation in progress.

### Help menu

The Help menu looks like this:

Interfaz de usuario gráfica, Texto, Aplicación

Descripción generada automáticamente

This tab has various options:

* Demos. Opens another menu where you can view demonstration videos of the application.
  + Opening a project created with version v1.0.

Demo on how to convert a project created with v1.0 to v1.1

* + Creation of project 1 from scratch with normal transitions.

Demo on creating a morphing project with normal transitions from scratch.

* + Creation of project 2 from scratch with FACE\_DETECTION transitions.

Demo on creating a morphing project with FACE\_DETECTION transitions from scratch.

* + Imported morphing project video example.

Demo on creating a morphing project with the application from an imported project.

* + Morphing video example 1

Demo on creating a morphing project with the application with normal transitions.

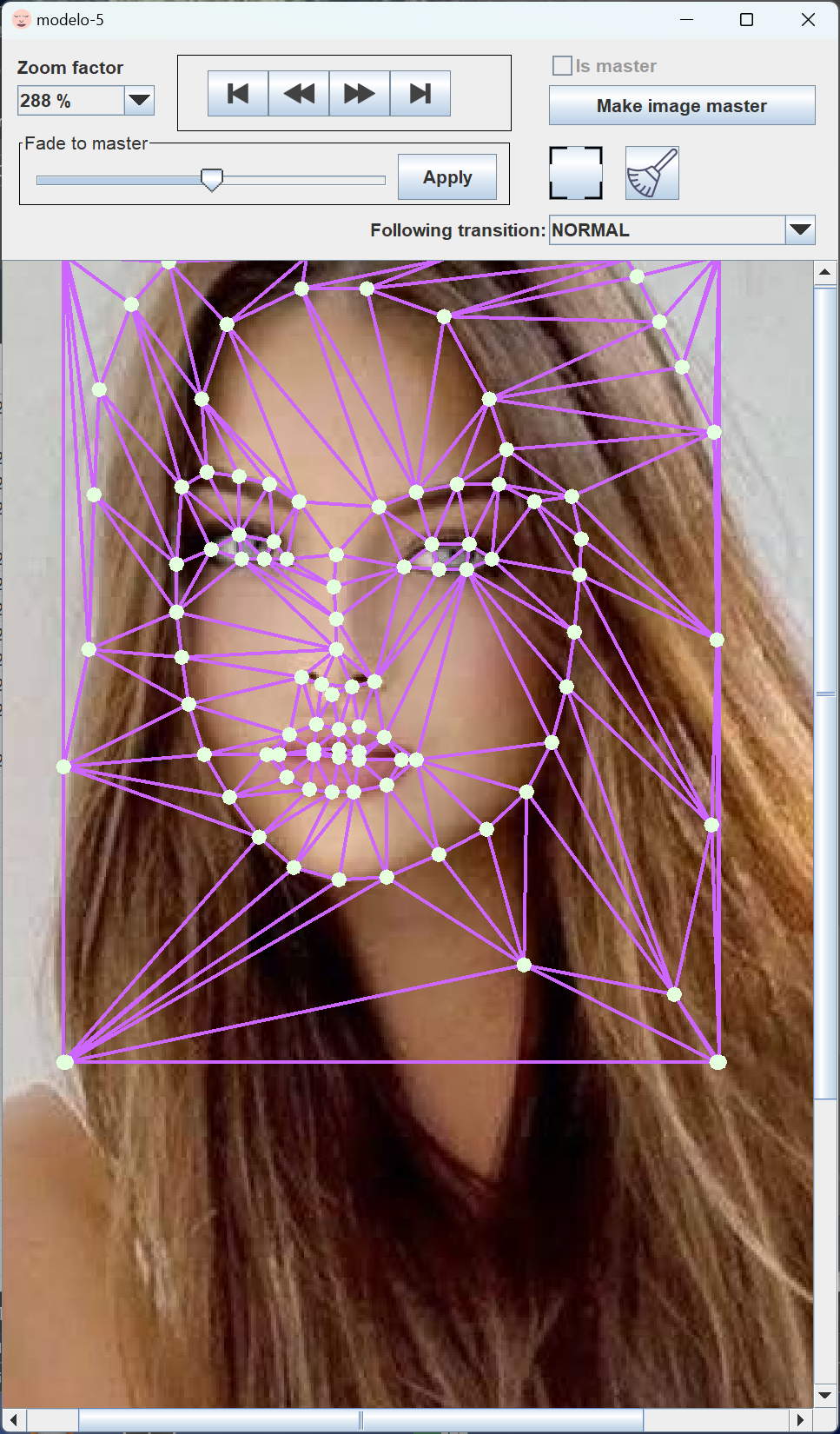
* + Morphing video example 2

Demo on creating a morphing project with the application with FACE\_DETECTION type transitions.

* User guide. Open this file.
* Search for a new version. Prompts the server to check if the application is running the latest version.
* What's new. Shows what's new in this version, with a history of major changes.
* License. Displays the license that was accepted the first time the application was run. See section: ***3.6-License***
* About. When you click this menu item, a window appears with information about the application, acknowledgements, and contact details. See section: ***3.7*** - ***About...***

## Editing window:

The window for editing the triangle mesh looks like this:



### Control panel

The upper control panel looks like this:

Interfaz de usuario gráfica

Descripción generada automáticamente

It has these options:

* Zoom. Indicates the zoom level of the image in the editing pane.
* Browser. Allows you to browse through the images of the project.
* Master
  + Master image. Indicates if the image is the master image.
  + “Make Master Image” button If the current image wasn’t the master image, it makes it the master image.

Note that if you use this option when there is a triangulation with vertices, the triangulation will be recreated (however, it is possible that the arrangement of the triangles will change with respect to the previous state).

* Fade to master. Fade from the current image to the master image. (overlays the master image on the current image, applying triangle mapping).
  + Scroll bar. Allows you to choose the fade intensity.
  + Apply. Apply the fade to the current image.
  + The fade will disappear when:
    - The ESC key is pressed
    - The image is changed
    - The Zoom level is changed
* Frame button. Select the Morphing frame. ***3.4*** - ***Define Morphing Frame window***
* Clear All button. Deletes all vertices.
* Pop-up “Next transition” window. Allows you to choose the type of transition between the currently selected image and the next.

Example of fading to the master image:

Una captura de pantalla de un celular con texto e imagen

Descripción generada automáticamente con confianza baja

### Editing panel

In this new version of the application, the Editing panel has three different layers. Only one layer can be active at a time.

Editing panel layers:

* Face selection layer
* Modify control mesh layer
* Triangulation layer

The default layer is the triangulation layer, which defines the triangle mesh that applies to NORMAL transitions between images.

After detecting the faces in an image, use the Face selection layer to select the face that will define the control mesh used for the image.

When a face is selected in the Face selection layer, use the Modify control mesh layer to fine-tune the detected vertices.

You can switch to other layers by right-clicking your mouse to open up a pop-out menu.

Switching to a layer may not be possible in the following cases:

* Switching to the face selection layer if the faces in the image haven’t been detected.
* Switching to the Modify control mesh layer if the detected faces haven’t been selected.

See the functions of each layer in the following sections.

### Face selection layer

When the faces in an image have been detected, you can then go to the Face selection layer.

In this layer, you can select the face that you want to morph. Your screen will show the detected vertices of all the faces that are inside the morphing frame.

Imagen de la pantalla de un celular con la imagen de una persona

Descripción generada automáticamente con confianza media

When you hover over one of the detected faces with your mouse, the face will turn into a triangle mesh.

Imagen de la pantalla de un celular con la imagen de una persona

Descripción generada automáticamente con confianza baja

Select the face that your mouse is hovering over by left-clicking on your mouse. After you have selected a face, go to the Modify control mesh layer.

### Pop-up menu

The pop-up menu looks like:

Interfaz de usuario gráfica, Texto, Aplicación, Chat o mensaje de texto

Descripción generada automáticamente

It has options that are either enabled or disabled and is organized into four sections:

First section:

* Do not select any face.

This option is to not select any of the detected faces.

Second section (to change layers):

* Face selection layer. (Disabled, since it is the currently active layer).
* Modify control mesh layer. Switches to the Modify control mesh layer (It will show as enabled if a face has been selected).
* Triangulation layer. (To change to the normal triangulation layer)

Third section:

* Run face detection. (It will be disabled since to be in this layer the faces will have already been detected.)

Fourth section:

* Recalculate triangulation.

(It will be enabled if both the master image and the current image have the same face selected and if the current image isn’t the master image).

* Recalculate all triangulations.

Similar to the previous option, but applied to all images at the same time.

### Modify Control Mesh layer

When a face from the image has been selected, you can then switch to the Modify control mesh layer.

The application will assign a control mesh comprised of 88 points (which are the 68 vertices detected by the library + the 12 vertices of the frame around the face + the 8 vertices inside the morphing frame) to a detected face.

You can then fine-tune the position of the vertices of the mesh in this editing layer.

You can modify the 68 vertices that make up the face and the corner vertices of the frame that covers the face.

Changes made to the vertices in the control mesh are saved and will be applied to all projects that use this face.

This means that if you use a face more than once or in other projects, you will not need to fine-tune the vertices each time.

Imagen que contiene persona, interior, viendo, computadora

Descripción generada automáticamente

It’s important to manually adjust the vertices before adding the 68 vertices of the detected face since these vertices will be used in the main triangulation to make the morphing effect.

Special attention should be paid to:

* The vertices around the eyes (especially the four that mark the ends of the iris)
* The vertices around the nose (so that the darker color of the nostrils do not affect the hue of the nose).
* The vertices around the mouth (sometimes the original detection is not as accurate in defining the mouth and it may be good to retouch it).
* The vertices that contour the face.

### Editing commands

You can edit with the following commands:

* Pressing SHIFT near a modifiable vertex: Selects the vertex.
* When a vertex is selected:
  + SHIFT + drag and drop: Moves the vertex.
* CTRL + mouse wheel:
  + Zoom in
  + Zoom out

### Pop-up menu

The pop-up menu looks as follows:

Interfaz de usuario gráfica, Texto, Aplicación

Descripción generada automáticamente

It has some options that may be either enabled or disabled and is arranged into four sections:

First section:

* Reset modified detected face mesh.

This option resets all the adjustments made to the vertices of the detected face back to how they were originally detected by the library.

* Reset face mesh frame.

This option resets all the adjustments made to the face frame (the 12-vertices frame that surrounds the detected points).

Second section (to change the layer):

Face selection layer. To select another face within the morphing frame.

Modify control mesh layer. (Disabled since it is the currently selected layer).

Triangulation layer (to switch to the normal triangulation layer).

Third section:

* Run face detection. (It will be disabled since to be in this layer the faces will have already been detected.)

Fourth section:

* Recalculate triangulation.

(It will be enabled if both the master image and the current image have a face selected and the current image is not the master image).

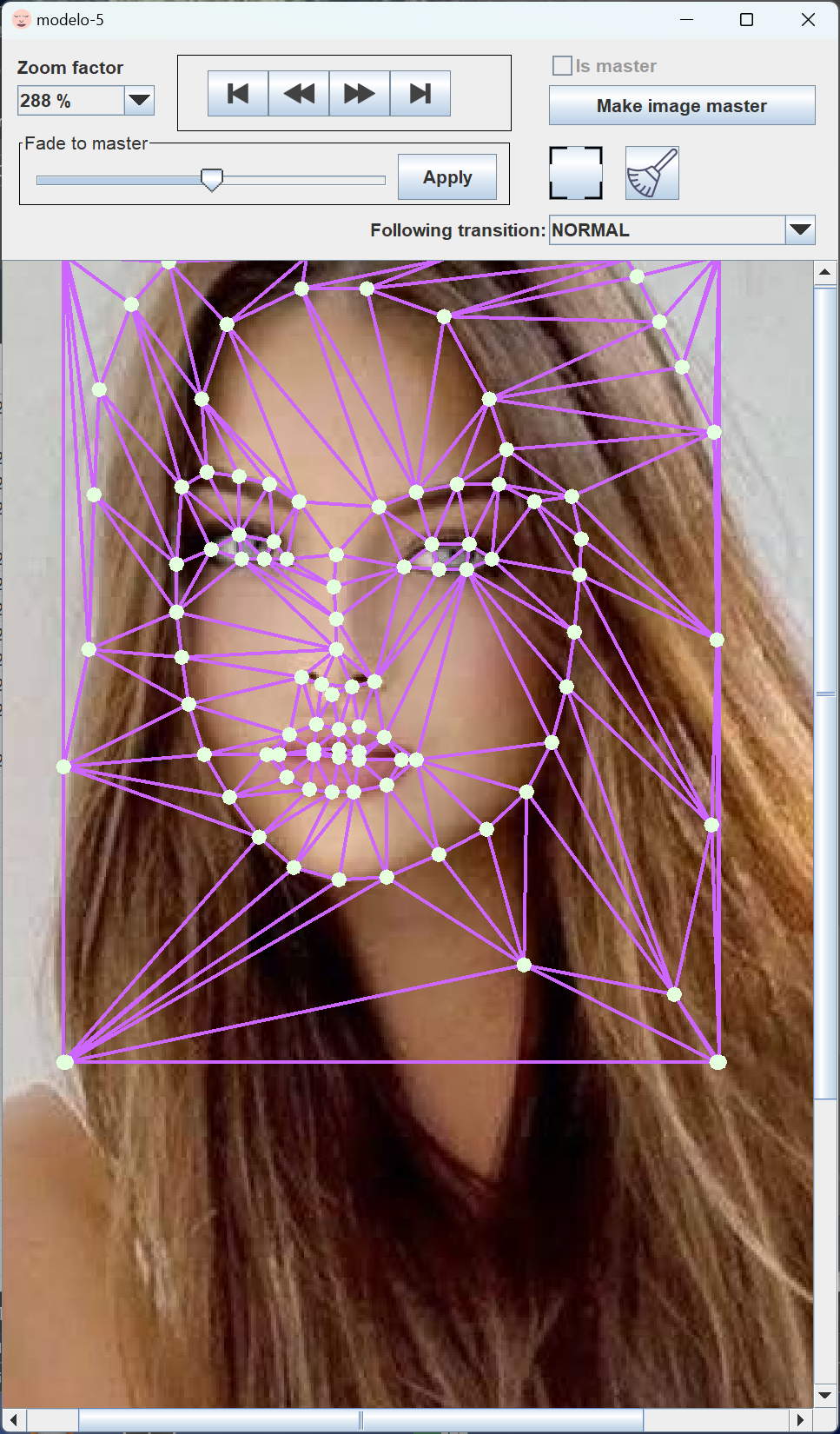
Used to recalculate the vertices in a normal triangulation by using the data from the detected faces and mapping the triangulation of the master image with the triangulation of the current image.

* Recalculate all triangulations.

Recalculates the triangulation of all images at the same time.

### Triangulation layer

This layer is the default layer. Use this layer to customize the triangle mesh that will be used to create the morphing effect for NORMAL transitions.The Editing panel looks like:



In this panel you can edit with the following commands:

### Editing commands

You can edit with:

* CTRL + mouse movement Shows what inserting a vertex at the mouse position would look like.
  + Right-click. Confirms the inserting of the new vertex.
  + Release CTRL. Leaves the inserting a new vertex state.
* SHIFT near a vertex: Selects the vertex.
* When there is a vertex selected:
  + SHIFT + Right-click Delete vertex.
  + SHIFT+ Drag and Drop Moves a vertex.
* When the mouse is in the Morphing frame and no vertex is selected:
  + SHIFT + Right-click. Enters the fine adjustment mode of the Morphing frame.
    - SHIFT + Right-click Moves the Morphing frame.
    - SHIFT + Right-click + Mouse wheel.
      * Scroll up. Increases the size of the Morphing frame.
      * Scroll down. Decreases the size of the Morphing frame.
    - SHIFT + Right-click + Click mouse wheel. Confirms Morphing frame setting changes.
    - Release SHIFT. Discards settings.
    - Release the right mouse button. Discards settings.
* Left-click. Selects the triangle the mouse clicked in, which is indicated by an outline in a different color and numbering its vertices. (if you change the image, the same triangle will be highlighted and its vertices will be numbered).

Displays the correspondence of the triangle in the image you select.

### Other commands

You can perform other commands apart from editing:

* Left-click + Drag-drop. Moves the scroll bars of the image, in the case that it doesn't fit completely in the editing pane.
* CTRL + Mouse wheel.
  + Scroll up. Zoom in.
  + Scroll down. Zoom out.

### Pop-up menu

The pop-up menu looks like:

Interfaz de usuario gráfica, Texto, Aplicación, Chat o mensaje de texto

Descripción generada automáticamente

Some options can be enabled or disabled, and it is arranged into four sections:

First section:

* Insert 68 detected points.

This option will be enabled when you are in the master image and have detected and selected the face in the image.

This requires that other vertices have not been added (or that all vertices have been cleared with the clear button).

Additionally, you should select the face for all the other images so that the vertices are placed in the right position.

Second section (to change layers):

* Face selection layer. (Enabled if the faces have been detected for this image).
* Modify control mesh layer. (Enabled if the face has already been selected for the image).
* Triangulation layer. (Disabled since it is the currently selected layer).

Third section:

* Run face detection. (Will be enabled if the faces for the image have not been detected yet).

Fourth section:

* Recalculate triangulation.

(Will be enabled if both the master image and the current image have a face selected and the current image is not the master image).

Used to recalculate the vertices in a normal triangulation by using the data from the detected faces and mapping the triangulation of the master image with the triangulation of the current image.

* Recalculate all triangulations.

Recalculates the triangulation of all images at the same time.

## Define Morphing Frame Window

In control panel of the Morphing editing window, clicking the Imagen que contiene Interfaz de usuario gráfica

Descripción generada automáticamente button opens the Define Morphing Frame window.

The window looks like:

Interfaz de usuario gráfica, Aplicación

Descripción generada automáticamente

### Aspect ratio

You can choose to keep the aspect ratio, in which case the width/height ratio of the Morphing area of the master image is maintained.

Although it is not mandatory to keep the aspect ratio, it is recommended.

### Editing the Morphing frame

You can select the Morphing area for the image by the following ways:

* With the spinners.
* By dragging/dropping with your mouse.

### Confirm changes

You can:

* Cross button. Cancel changes.
* V button. Confirm changes.
* Arrow button. Discard changes and continue editing.

## Settings

This window allows you to change the general application settings.

The window has several tabs:

### Application language settings

The tab looks like this:

Interfaz de usuario gráfica, Texto, Aplicación, Correo electrónico

Descripción generada automáticamente

You can configure the following settings:

* Language. The language of the text of the application.

You can choose the following languages:

* EN English
* ES Spanish.
* CAT. Catalan.
* Language locale. The Java locale that will be used by the application for this language.

The application uses it to convert numbers to formatted numeric strings.

* Additional language. A new additional language that appears when you access the language settings.

For the new language, you need to select the Java locale to use.

If you want to set the language to a language that is not available in the application, you can add your language by translating the files inside the directory that is created when you click on the "Add Language" button.

The translated files are copied to the directory indicated in: "Additional language directory”

The text files are copied in a format for Java properties.

If you are unfamiliar with this format, note that the file has a title, and after it, a tag variable number with its value, similar to the following:

# TITULO

# xxxxxxxxxx

ETIQUETA1=texto 1

ETIQUETA2=texto 2

...

The tags must stay the same while the texts can be modified depending on the translation in the chosen language.

In addition, there are some files in RTF format, which you will have to translate with an RTF editor (a typical editor for that format is Office Word).

If you create a translation for an additional language other than the ones available in the application, you can send it to me (frojasg1@hotmail.com) and I will include it in the next versions of the application.

### Application view settings

The tab looks like:

Interfaz de usuario gráfica, Texto, Aplicación, Correo electrónico

Descripción generada automáticamente

* Application window size. This setting allows you to control the appearance of the application’s window by choosing different sizes, depending on the dimensions and definition of your screen.
* This setting allows you to control the appearance of the application's windows, allowing you to choose the small size, the normal size, or the large size (which will depend on the size and definition of your screen).

### Thread count settings

The window looks like:

Interfaz de usuario gráfica, Texto, Aplicación, Correo electrónico

Descripción generada automáticamente

This tab shows the number of threads that will be used in the morphing animation.

The application allows you to choose a thread count between 2 and the number of parallel threads that your system allows minus one.

The thread count is related to how many tasks your system is running simultaneously.

Theoretically, the more threads used, the faster the images are generated for the morphing animation.

A higher thread count can result in more images being stored in the buffer and causing the system to lag when making changes (e.g. resizing the morphing window or canceling a morphing animation already in process).

It could also cause the system to run out of memory, due to the images in the background waiting to be processed (to display them or to generate the video).

If you do run out of memory, try to lower the thread count in the settings to resolve the problem.

This same setting is also applicable to the morphing video generator application, although it is not possible to modify this setting from that application.

## License

The “License” tab, located in the Help menu, displays the license that was accepted the first time the application was run.

It looks like this:

Interfaz de usuario gráfica, Texto, Aplicación

Descripción generada automáticamente

## About...

The “About...” button displays a window with a summary of what is new in this version. Acknowledgements are also included.

It looks like this:

Interfaz de usuario gráfica, Aplicación

Descripción generada automáticamente

# Acknowledgments

In this section, I would like to mention and give thanks to the authors of the external resources used in the application.

## Delaunay triangulation library

I would like to give thanks to a library that I found on the internet that implements an algorithm to calculate the Delaunay triangulation in a highly optimized, progressive way.

I did a Google search and found excellent resources on the Delaunay triangulation (I downloaded them for free, but would have gladly paid for them, though I learned that after I got it working, and not before):

* lischinski.incremental.delaunay.triangulation.pdf
* imm5298quadEdge.inc.delaunay.triangulation.reversion.pdf
* Quad-Edge.Primitives for the manipulation of general subdivisions and the computation of Voronoi diagrams.pdf

The first resource hosts the library that I translated from C++ a Java.

The second resource explains the different elements of the QuadEdge model for the Delaunay triangulation and how vertices that have been inserted can be undone (I found this very useful).And the third resource is the article with the original QuadEdge theory.

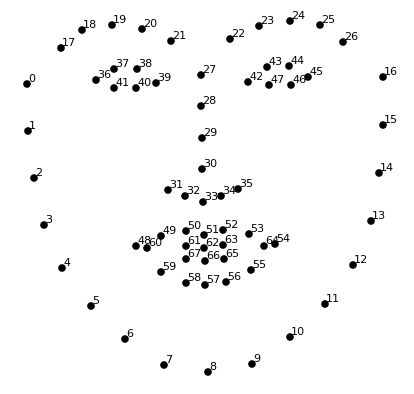
Thank you to *Dani Lischinski* for writing such a wonderful library in C++ that implements the Delaunay triangulation with the QuadEdge model.

Thank you to the QuadEdge model theorists for that triangulation:

(Guibas and Stolfi 1985) Leonidas Guibas and Jorge Stolfi. Primitives for the manipulation of general subdivisions and the computation of Voronoi diagrams. ACM Transactions on Graphics, 4(2):74{123, 1985.

## Face detection library

This library allows you to obtain 68 distinct points from each of the detected faces of an image.



For more details visit these websites:

About the authors:

<https://github.com/cran/dlib/blob/master/inst/AUTHORS>

Example of the application:

<https://www.studytonight.com/post/dlib-68-points-face-landmark-detection-with-opencv-and-python>

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