DeepFaceLab - *a program aiming to replace a person in a video using a neural network, running on NVIDIA / AMD / IntelHD Graphics graphics accelerator.*

Developer: iperov

Developer Github: https://github.com/iperov/DeepFaceLab

Capacity: 64bit

Interface Language: English

Minimum System Requirements:

> Windows 7 and higher
>
> Processor that supports SSE instructions
>
> 2GB RAM spooling
>
> **OpenCL** - compliant graphics card (NVIDIA, AMD, Intel HD Graphics)

Recommended System Requirements:

> Windows 7 and higher
>
> Processor with support for AVX instructions
>
> **NVIDIA** video card with 6GB video
>
> 8GB RAM

Available Assembly:

`DeepFaceLabCUDA9.2SSE`   for **NVIDIA** cards up to GTX1080 and any 64-bit processors.

`DeepFaceLabCUDA10.1AVX`   for **NVIDIA** cards up to RTX and processors with support for AVX instructions.

`DeepFaceLabOpenCLSSE`   for **AMD** cards and any 64-bit processors.

Mirror with older versions: https://mega.nz/#F!b9MzCK4B!zEAG9txu7uaRUjXz9PtBqg

Features of DeepFaceLab:

- Functions with lack of any presets, except on your graphics card drivers. Tested on a clean Windows 7 and 10, as well as in VMware.

- Operates on any OpenCL-compatible graphics card with 256Mb of memory and above, even quite old.

- Selects the "best" video card automatically, so you can work with office applications on the video card when weaker, and network training will be better.

- Able to to fully exercise the CPU. After 2 days of training, the 8th generation of Intel processors is able to provide a good demonstration

- Necessary meta-data is stored directly in the individual lessons .JPG files

- Manual selection of mode officials

- Program has learned sorting individuals to quickly remove unwanted entities.

- Faster work with video: extraction, noise removal, assembly of the final video

Getting Situated: This program does not guarantee a perfect replacement of people in all cases! The replacement depends on the quality of the source data, the compatibility of light sources, and other variables. Since this technology has only appeared recently (February 2018), it is far from ideal, because it is replaced only by a person with no forehead and hair. Please note that you can spend a lot of time and effort, but in the end, get an undesirable result! On first attempt, there is a low chance of making a successful Faike. Only after multiple attempts with different people, you will understand the small nuances to create a successful result.

See the introductory video instructions to get familiarized with the working process:
https://www.youtube.com/watch?v=K98nTNjXkq8

DeepFaceLab is created with pure enthusiasm by one person. Therefore, if you find any errors, please be understanding.

Refresh the driver on your graphics card.

First, start CUDA assembly in a clean folder. Note that the torrent may take a long time because of the compiled GPU program.

Definitions:

src - a person who will be used for replacement.

dst - a person who will be replaced.

`DeepFaceLab \ workspace` - the work folder to store the entire model (video, photo, files of the program). This can be renamed to keep as a backup or to work on another.

1) `clear workspace.bat` – clean or create all the folders inside the workspace folder.

Put your video format data_src.xxx (maximum 1080p) in the workspace folder. This video should be of the src person to be used for replacement. There is already a test video to be used in the workspace folder.

Put your video format data_src.xxx (maximum 1080p) in the workspace folder. This video should be of the dst person to be replaced. There is already a test video to be used in the workspace folder.

> *Note: xxx is the extension of the video file (such as .mkv, .mp4, .avi)*

2) `extract images from video data_src.bat` - converts video where to get the person to a set of PNG in the workspace \ data_src

`Enter FPS (:? Help skip: fullfps):`

> *how many frames of video every second extract, skip = all frames.*

`Output image format? (Jpg png:? Help skip: png):`

> *The format of the output image jpg or png. Png extracts lossless, but size 10 times greater. Needless extract also slowed down significantly, especially if saved on the HDD, the SSD instead.*

Here we collect pictures from which we extract the src face. The more the better.

3.1) `cut video (drop video on me) .bat`

optional. Crop video which replace the person for the time that you specify.

You need to drag a video file on the .bat file, the original file is saved and there is a new suffix _cut

`From time (skip: 00: 00: 00.000):`

> *the start time of pruning*

`To time (skip: 00: 00: 00.000):`

> *time of the end trimming*

`Specify audio track id. (Skip: 0):`

> *you can specify the audio track. It is useful, if for example you need a different language from the film.*

`Bitrate of output file in MB / s? (Default: 25):`

bitrate Output file = 25 skip.

Test video, which already is in the folder, no need to cut.

`3.2) extract images from video data_dst FULL FPS.bat`

Converts video to replace the face in a set of PNG in the workspace \ data_dst

Here, the extraction only with FULL FPS, because each frame is to be processed.

`3.other) denoise extracted data_dst.bat`

`Denoise factor? (1-20 default: 5):`

the degree of noise suppression

Finished before removing dst parties! making the passage of the extracted video frames, removing noise while maintaining crisp edges.

Allows thereby make the final fake more plausible, because the neural network is not able to make a detailed skin texture, but the edge makes it quite clear.

Therefore, if the entire frame will be "blurred", and the fake will seem more plausible. Especially true for scenes of film, which are usually very clear.

`4) data_src extract faces ... .bat`

fetches a finite set of persons from PNG to workspace folder \ data_src \ aligned

Options bat files:

MT, S3FD detectors.

For optimal src MT detector.

MT - a little bit faster, it produces more false faces.

S3FD- more accurate, less false persons (recommended)

MANUAL - Extract manually is useful for src-only pereizvlecheniya already learned persons, if found somewhere errors using `4.2.other) data_src util add landmarks debug images.bat`

To do this, you must manually make a backup copy data_src \ aligned \, moved from this folder to the person data_src \, do manual extraction, then combine data_src \ aligned with the backup.

GPU

Here or ALL (all) or Best (best).

If you only have one GPU, it makes no difference what to choose.

If you work in office applications on the GPU weak, and there is a strong, then you choose Best.

For maximum speed on multi-GPU choose ALL, but then the office work on the main GPU may slow down.

DEBUG

Writes workspace \ data_src \ aligned_debug each frame with dedicated individuals and facial points, thus you can watch the work of the detectors.

4.1) data_src check result.bat

view sample results people using portable XNViewMP program.

Here your goal - to remove unwanted facial.

First, you flip through scrolls and take away those unwanted persons who are in a row in large groups. No need to remove smaller groups. For this is sorted.

If the correct person is mixed with others, you start sorting the following paragraphs.

Sort of sharpness in any case do because footy src person should be removed.

4.2.1) data_src sort by blur.bat

Sort by field. You run and wait for sorting. Then look at the results. Most individuals will be cloudy at the end. For src important to clean muddy face.

4.2.2) data_src sort by similar histogram.bat

After sorting this person will be grouped by content, so that weed out unwanted person is now much easier.

You flip through scrolling and deleting unwanted persons groups.

4.2.4) data_src sort by dissimilar histogram.bat

This sorting reserves towards the end of the list of those images that have the most similar.

Usually it is the person in front, which is the most, because the actor often looking directly at the camera, or somewhere in the same direction in an interview.

Part can remove the discretion from the end of the list.

`4.2.5) data_src sort by face pitch.bat`

An optional item. It sorts the face so that the first face looked down the list, and the end of the list - up.

`4.2.5) data_src sort by face yaw.bat`

An optional item. It sorts the face so that the first list face looked to the left and to the bottom of the list - right.

`4.2.6) data_src sort by final.bat`

Recommended paragraph.

`Target number of images? (Default: 2000):`

enter the desired number of images

Automatically makes the final selection of the best individuals from any number in the target number.

Use only after a set of people cleaning other items, if you have more than 2000 persons.

Weed out persons moved to the trash (aligned_trash)

`4.2.other) data_src sort by black.bat`

Sorted by the number of black pixels in the bottom of the list. Face carved screen allows you to weed out.

`4.2.other) data_src sort by one face in image.bat`

Move to trash (aligned_trash) all images in which there was more than one person

`4.2.other) data_src sort by original filename.bat`

Sort according to the original file name

`4.2.other) data_src util add landmarks debug images.bat`

An optional item. It adds to the extracted image data_src persons with facial plotted points with a suffix to the file _debug.jpg

This allows you to manually sift very poor recovery from your set src persons.

Prior to this, do the sorting for yaw.

It makes sense to only delete those that caused his eyebrows lower than the actual, or jaw contour essentially comes to the face.

After sifting manually delete all files matching the * _debug.jpg

`4.2.other) data_src util recover original filename.bat`

Restores the original file name of the extracted person.

The result of the extraction src persons.

Muddy persons in the video will have to be removed.

Persons closing something (hand, hair, etc.) will also need to be removed.

After bringing the set of individuals in the proper form do the final sorting sort by final.

Optionally, you can hold the item `4.2.other) data_src util add landmarks debug images.bat`

You can assemble several different sets of persons of the same actor and then use them depending on the conditions dst face, placing them in a folder data_src \ aligned

5) data_dst extract faces ... .bat

The same as that of claim 4, with some differences.

Here we extract the person to be replaced.

Detector MT, S3FD?

In most cases - S3FD.

If a person is not defined in a certain frame, then this is an option + manual fix - allows you to manually specify the person for frames where there are no predefined entities.

The catch with MT + manual fix that on the frame can be defined unwanted persons other than the main, so the program does not prompt you to specify the person in this picture. In this case, you can check in a folder data_dst \ aligned_debug any person showed up at all.

In very extreme cases, or to experiment with a fully manual sampling (manual), ie for each source frame dst you manually go through and point person.

Box manual corrections officials.
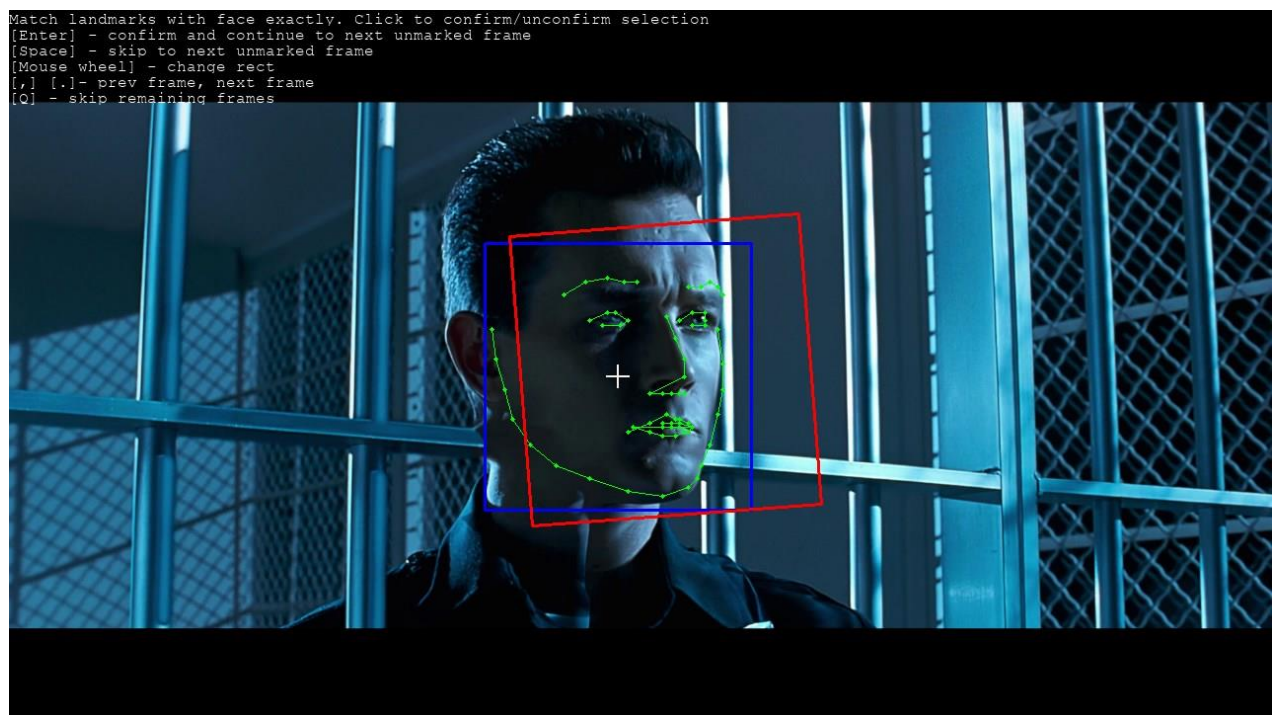
here you need to combine the green dots with a person.

Control:

Enter - confirm the person and the next frame.

Space - skip frame.

. .- move between frames

mouse wheel - change the rectangle.

Cry - fixing points

**A**- change the accuracy mode, affects the amount of FPS

H - hide help

`5) data_dst extract faces MANUAL FIX DELETED ALIGNED DEBUG`

A very important point. Directly affects the final quality of the fakes.

allows pereizvlech those frames of dst, whose results debug of clause 5.1 have been deleted by you.

What is it for? To make the fake better, you need to check dst aligned_debug frames in a folder, you can view them via the Item 5.1.

Dst improperly scribed person may lead to significant deterioration:
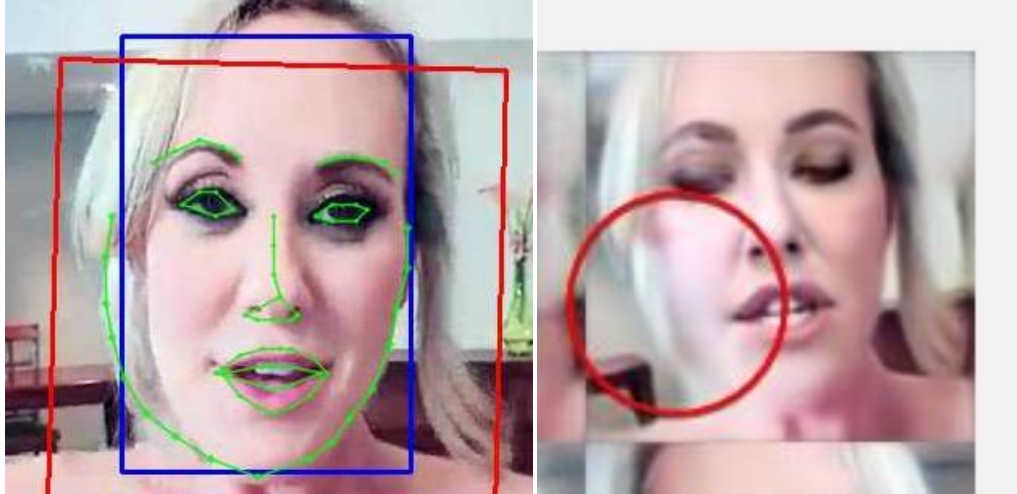
If somewhere will find that the facial contour is substantially different from the real, for example moved down to background, then you remove the footage from aligned_debug folder (item 5.1) and the run to this point.

There will be a manual pereizvlechenie remote frames. Video explaining the process:https://www.youtube.com/watch?v=7z1ykVVCHhM

`5.1) data_dst check results debug.bat`

see all dst frames superimposed on top of them predicted contours of the face

`5.1) data_dst check results.bat`

Similarly, the results look the sample face dst, and remove other non-targeted persons. A target face even turbid - reserve.

`5.2) data_dst sort by similar histogram.bat`

If the target video contains other unwanted persons can produce this sort, and then remove these persons will be easier.

`5.3.other) data_dst sort by original filename.bat`

Sort according to the original file name

`5.3.other) data_dst util recover original filename.bat`

Restores the original file name of the extracted person.

The result of the extraction of dst persons.

Your goal is to remove only the target person (even hazy) of each frame by removing all other persons.

```
5.4) data_dst mask editor.bat
```
 Manual correction masks dst persons.

Optional or recommended item, because you can spend a lot of time, but did not get improved results.

Applicable only for SAE MODELS with the option of studying a mask or by examining the options of style.

Attention: You can spend a lot of time, but did not get improved results.

This mode has been created to improve one of the converter options, but can also be used in your project.

You can manually adjust the mask dst persons to remove such obstacles from his face.
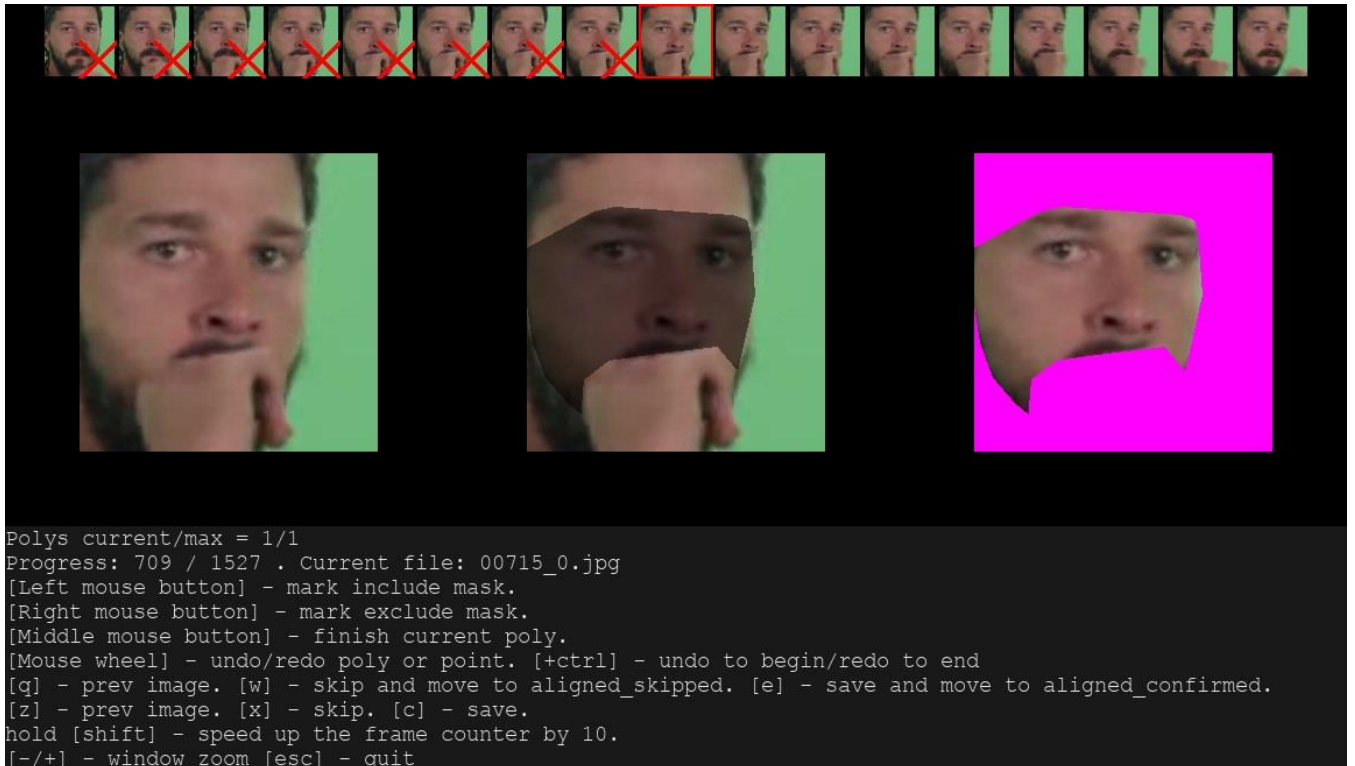
Result of conversion:

Sophisticated mask harder to train.

It is worth remembering that in the converter already have a mode that removes face obstacles.

Management in the Mask Editor.

Left mouse button - including the mask mark. Right mouse button - eliminating the mask mark.

Middle mouse button - to complete the current polygon.

Mouse wheel - undo or redo actions with points. Hold ctrl - will move to the beginning or end of the story.

The W - skip it and move to folder aligned_skipped - applicable for sorting people into a different folder. In most cases, you do not need this action.

E - save and move aligned_confirmed folder. - applicable for sorting people into a different folder. In most cases, you do not need this action.

C - flow into the same folder.

X - to save in the same folder.

Q / Z - previous image.

Sandwiched SHIFT - accelerates the movement of the HR 10.

- / + - increase / decrease the window size.

ESC - exit.

6) `train ... .bat` Training.

disable any program that can use video memory.

If in the process of launching the training got a lot of text that contains one of these words:

```
Memory Error

Allocation

OOM
```

then on your GPU model does not start, and you need to trim a model for this, see the description of the options models.

When you first run the model, the program will ask about the different options that are saved and will be used for subsequent runs.

Simply pressing Enter - will use the default values.

`Which GPU idx to choose? (Skip: system choice):`

With multi-GPU can train one scene to the different models and options of the same model without cloning folders. Just choose GPU code at the start of exercise / conversion, and then the model files in the workspace folder \ model will be prefixed with this GPU in the name.

If you leave the GPU choice by default, then choose the best GPU and model files will not be prefixed.

`Enable autobackup? (Y / n:? Help skip:% s):`

Enable backup model files. The files will be saved to the model / <> _ autobackups /

`Write preview history? (Y / n skip: n):`

Do write history preview of the disc

`Choose image for the preview history? (Y / n skip: n):`

Select image for preview stories. [P] - the following, [enter] - confirmation

`Target iteration (skip: unlimited):`

Target iteration, to achieve that training will stop.

`Batch_size (skip: model choice):`

range of batch sizes - this is how many images at a time is fed to the neural network training. By default, selected low value, but you can pick up this value to below your video card. The bigger, the better.

`Feed faces to network sorted by yaw? (Y / n skip: n):`

feeding patterns src persons sorted according to the same direction as dst. The idea is to feed just the right person. However, it is not fully tested is good or bad.

`Flip faces randomly? (Y / n:? Help skip: y):`

feeding model, all face accidentally inverted horizontally. When the final face off options will be more natural, but then src assembly of persons shall cover all angles of rotation.

`Src face scale modifier% (-30 ... 30,:? Help skip: 0):`

scaling modifier src persons. If src face wider than dst and fake to get bad, it makes sense to slightly reduce this value.

If the model is run for the second time:

`Press enter in 2 seconds to override some model settings.`

If you press Enter for 2 seconds, then it will be possible to replace some of the model options.

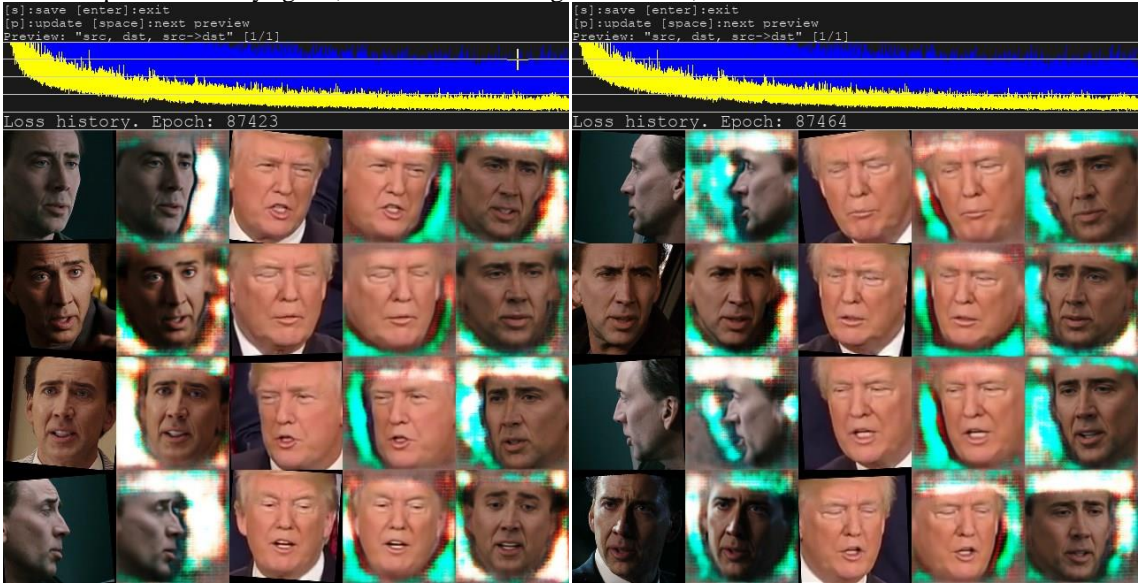List of training models. Also it specifies the minimum requirements for GPU memory.

H64 (2GB +)	half of the face with a resolution of 64 - this is the original FakeApp or FaceSwap, only better at the expense of training the neural network + mask excludes the background around the face + amended converter. For graphics cards with video memory 2 and 3GB of this model works in a reduced mode, ie, quality will be less than 4GB.
H128 (3GB +)	as the H64 is only with a resolution of 128. However, half of the face may be poorly trained in some light conditions and head rotation, etc. For graphics cards with video memory 3 and 4Gb this model operates in reduced mode, ie, quality will be less than 5Gb.

options for **H64** and H128:

```
Use lightweight autoencoder? (Y / n,:? Help skip: n):
```

   choose a stripped-down model. It is necessary for video cards with <= 4Gb video memory.

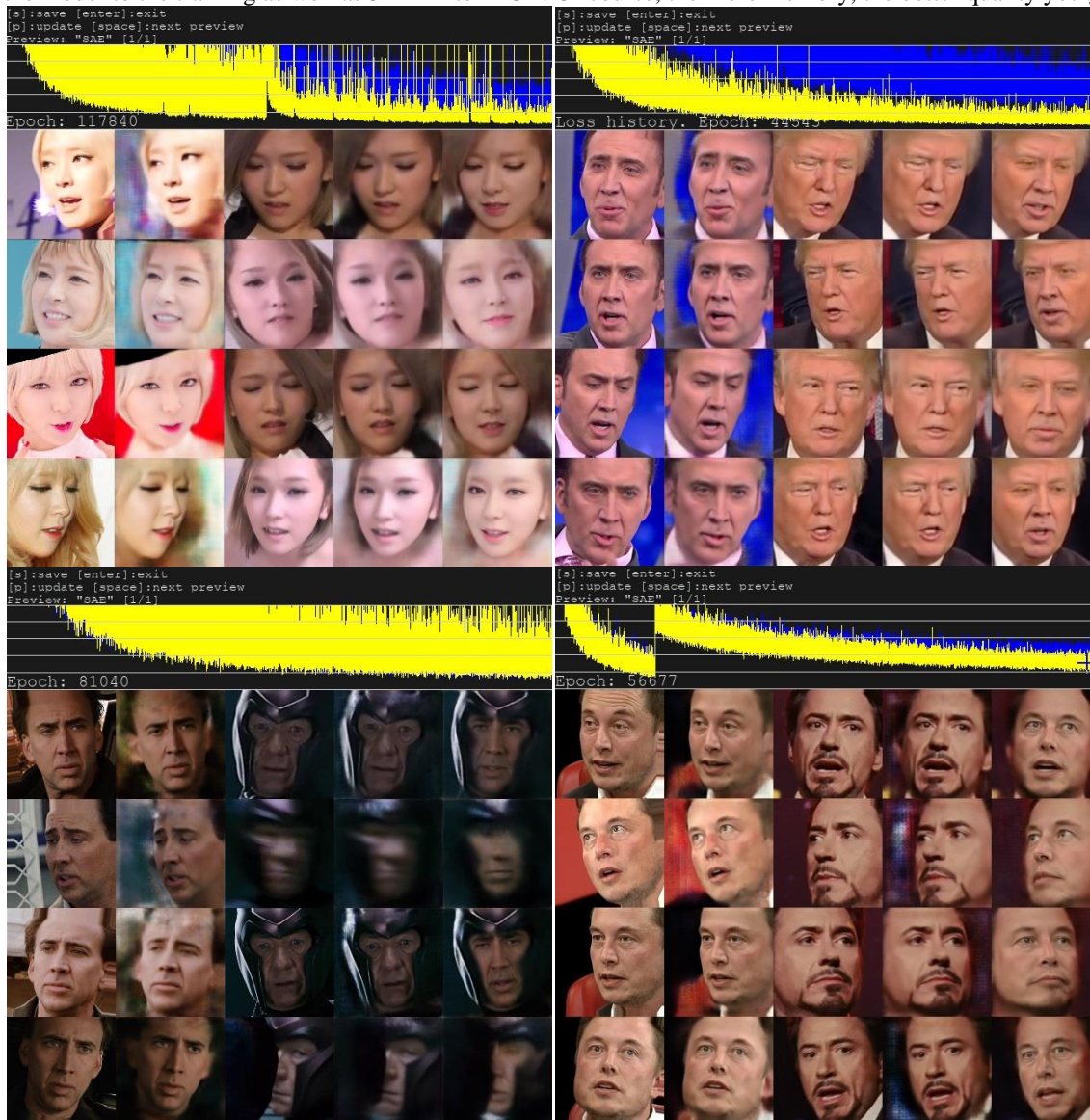|	
DF (5GB +)	model from dfaker. Full-face model with a resolution of 128, a smart training feature persons excludes the background around the face.
LIAEF128 (5GB +)	like the DF, only trying to morph the original face of the target person, retaining the original features of the face. Morph is not always good, and can do no recognizable face, then choose DF.

options H64, H128, DF, LIAEF128 models:

Use pixel loss? (Y / n,:? Help skip: n / default):

It makes it easier to improve the fine details and remove jitter. Include only after 20k iterations.

SAE (512MB +)	The latest best and flexible model. It contains all of the other models. It is possible to transfer the style of face and lighting, which will be studied directly by the neural network. Various settings can be configured when you first start. These settings affect what size will the network and I run on your video card, so you can adjust the model to the training as well as 512MB to 24GB. Of course, the more memory, the better quality you get. EXAMPLE Faika Cage-Trump:https://www.youtube.com/watch?v=2R_aqHBClUQ Example Faika Elon Musk - Robert Downey jr:https://www.youtube.com/watch?v=OLWFnPwzgEY

options only for `SAE` model:

```
Resolution (64-256:? Help skip: 128):
```

> *resolutionperson. More resolution - requires more memory, longer trains model. You can select any value from 64 to 256 fold 16.*

```
Half or Full face? (H / f,:? Help skip: f):
```

> *Half or full size of the face*

```
Learn mask? (Y / n,:? Help skip: y):
```

> *learn whether the mask. From the study, the mask will be smoother and less trembling, otherwise it will use the rough. However, in a stylized exercise you can do without the study of the mask.*

```
Optimizer mode? (1,2,3:? Help skip:% d):
```

> *This option is only NVIDIA video cards. optimizer mode neural network. 1 - by default. 2 - allows you to train the network x2 larger, require more RAM. 3 - allows you to train the network x3 larger, require more RAM and up to 30% slower.*

```
AE architecture (df, liae, vg:? Help skip: df):
```

type of architecture of the neural network.

```
AutoEncoder dims (128-1024:? Help skip:% d):
```

the number of network dimensions. All information about individuals will be packed into these dimensions. If these are not enough, for example, closed his eyes will not be recognized. More - better, but can not start because of insufficient memory. Can be reduced to achieve the performance on your video card.

```
Encoder dims per channel (21-85:? Help skip:% d)
```

the number of dimensions of the rotary encoder network model helps to identify patterns of large faces, more - better, but can not start because of insufficient memory. Can be reduced to achieve the performance on your video card.

```
Decoder dims per channel (11-85:? Help skip:% d)
```

the number of dimensions of the network decoder, helps increase the detail, more - better, but can not start because of insufficient memory. Can be reduced to achieve the performance on your video card.

```
Remove gray border? (Y / n,:? Help skip: n):
```

Remove the gray line on the border of the predicted face. It requires more computational resources.

```
Use CA weights? (Y / n,:? Help skip:% s):
```

Whether to use the initialization Convolution Aware type weights. It achieves greater accuracy of the model, but spends more time at the first initializing model.

```
Remove gray border? (Y / n,:? Help skip: n):
```

Remove the gray line on the border of the predicted face. It requires more computational resources.

```
Use multiscale decoder? (Y / n,:? Help skip: n):
```

whether to use multiscale decoder allows to achieve higher definition.

```
Use pixel loss? (Y / n,:? Help skip: n / default)
```

It makes it easier to improve the fine details and remove jitter. Include only if the quality does not improve over time. Enabling this option increases the risk of collapse model.

```
Face style power (0.0 .. 100.0:? Help skip:% 1f.):
```

speed transfer of studying a person of style, such as lighting and color. May cause artifacts at large. Floating-point number. 0 - do not teach. Enabling this option increases the risk of collapse model.

```
Background style power (0.0 .. 100.0:? Help skip:% 1f.):
```

speed studying the background around the face. In most cases, morphic face in dst. Floating-point number. 0 - does not teach. Enabling this option increases the risk of collapse model.

```
Apply random color transfer to src faceset? (Y / n,:? Help skip:% s):
```

Increase individual variability src set by applying color on a transfer src dst samples of random samples. This is the same as the study Face style power, only the color transfer is more accurate and requires no additional GPU resources. However, during exercise can be increased, due to the fact that the neural network will have to teach more variety src set of persons.

```
Enable gradient clipping? (Y / n,:? Help skip:% s):
```

> *Enable pruning gradient reduces the chance of collapse model, sacrificing speed workout.*

```
Pretrain the model? (Y / n,:? Help skip: n):
```

> *Predtrenirovat model with lots of different people already included in the assembly. This technique can help to train with fake distinguish shapes a person or lighting conditions. Face look more morphing. The longer you train the model, the more the person will look morphing later.*

AVATAR (6GB +)	Model for managing someone else's face.

how AVATAR use model.

1) Put the workspace \ data_src.mp4 video with a square aspect ratio, which contains a sitting news reporter, and the background is stable and does not move. Longitude video 10-20 minutes.
2) Are doing extract images from video data_src.bat with FULL fps
3) Put the workspace \ data_dst.mp4 video with a square aspect ratio, which contains individual who will manage src face.
4) Are doing extract images from video data_dst FULL FPS.bat
5) Are doing data_src mark faces S3FD best GPU.bat
6) Are doing data_dst extract unaligned faces S3FD best GPU.bat
7) Train train AVATAR.bat, stage settings 1. Batch size to the maximum value for your video card. (Example 32 6GB) to an acceptable definition persons.
8) Train train AVATAR.bat, stage 2. Setting Batch size to the maximum value for your video card. (Example 4 for 6GB) to an acceptable definition persons.
9) Further normally convert AVATAR.bat

Options for `AVATAR` model:

```
Avatar type (0: source, 1: head, 2: full_face:? Help skip: 1):
```

> *avatar type. It means a type of the target image. Source - it means to be the same in both data_src folder. Head - lined on the nose, covering the entire head. Full_face - lined on the nose, covering the whole face. It is recommended to use the Head*

```
Stage (0, 1, 2:? Help skip:% d):
```

> *Step workout. Trains first 1, then 2. You can choose to stage 0, there will be training at the same time 2 stage, but will be limited to a maximum batch_size for the 2nd stage.*

During training, you can go through the Enter, pressing it into the window Training preview, and run at any time, the model will continue to be counted from the same point.

Train for 24 hours or more. When the result is satisfying - and leave through the Enter, pressing it into the Training preview window.

'P' button (on the English keyboard layout) in Training preview window updates the preview.

In the Training preview as we can see the curve of error. Falling, it shows the progress of training over time.

The Training Result:

You choose the model according to the scene and your personal experience.

`7) convert ... .bat` Overlay persons.

You choose the model and the GPU number (if you have more than one) with which to train.

debug option allows you to see the process of applying persons and some technical information for each frame in the console, press the space bar in the preview window.

<div align="center">The basic concept of blending faces.</div>
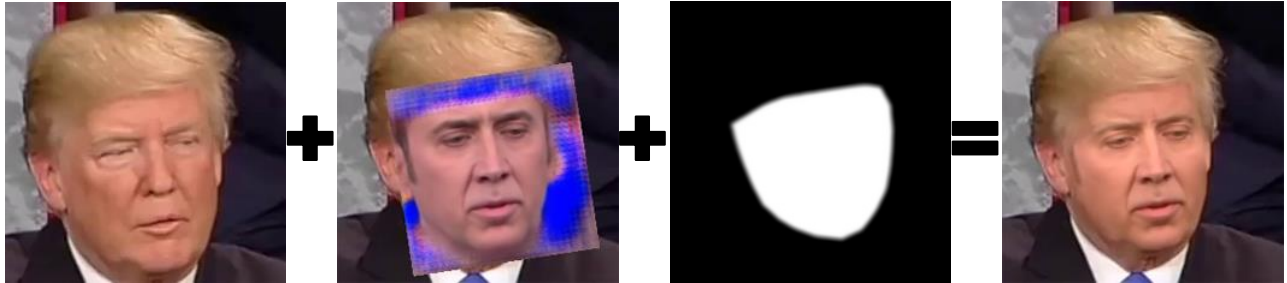
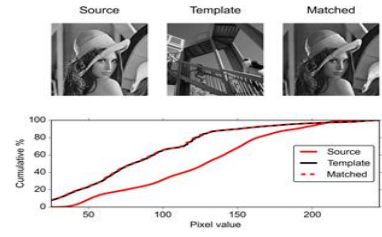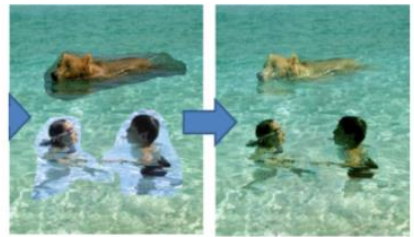Next, when you run the program asks about the options:

`Use interactive converter? (Y / n skip: y):`
> *Whether to use the interactive mode of the converter. In this mode, you can change the settings for each frame and track changes in real time. Help hot keys will be highlighted at the beginning of the work.*

`Choose mode: (1) overlay, (2) hist match, (3) hist match bw, (4) seamless (default), (5) raw:`
> *Selecting the overlay persons.*

<div align="center">modes</div>

Overlay	*direct overlay of the predicted face of neural network without pre-treatment*
Hist-match	*overlap with the histogram equalization.*
Histh-match-bw	*overlap with the histogram equalization channel of grayscale.*
Seamless	*the imposition by the Poisson* "Poisson image editing." ACM Transactions on Graphics (TOG). Vol. 22. No. 3. ACM, 2003.
Raw	*get the green layers for its own processing in the video editor, such as After Effects.*

By default, if you press Enter - choose seamless.
Which to choose? It depends on the case. You try everything and see the result.

<div align="center">options</div>

```
Seamless hist match? (Y / n skip: n):
```

> *For the regime seamless. Include whether the histogram equalization.*

```
Masked hist match? (Y / n skip: y):
```

> *For modes hist match, hist match bw, seamless, indicates whether the histogram equalize the mask face.*

```
Mask mode: (1) learned, (2) dst, (3) FAN-prd, (4) FAN-dst (5) FAN-prd * dst (6)
learned * FAN-prd * FAN-dst help (?) . Default - 1:
```

> *Mask type.*
>
> > `Learned` *–**Learned**mask if you have selected the option Learn mask. The contours of the mask mitigated, but can sometimes shake.*
> >
> > `dst` *–***crude** mask obtained directly from individuals dst, so quivering contours of the mask.
> >
> > `FAN-prd` *–Mask received predtrenirovannoy DEV_FANSEG model of the predicted face. Facial contours are not trembling.*
> >
> > `FAN-dst` *–Mask received predtrenirovannoy DEV_FANSEG model of dst face. Facial contours are not trembling.*
> >
> > `FAN-prd` *dst - the mask obtained by multiplying the FAN-prd and FAN-dst

`learned * FAN-prd * FAN-dst` - a mask obtained by multiplying the learned, FAN-prd and FAN-dst

The advantage of FAN masks: you can not get a trembling mask, without studying its model. FAN also removes the mask from the face of obstacles, such as hair, fingers, microphones, etc.

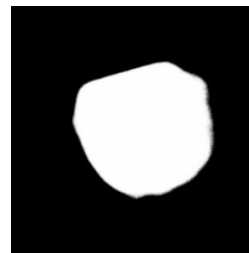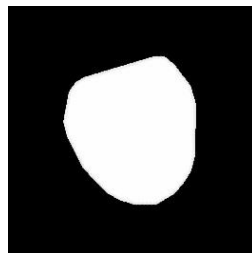Lack FAN masks: may issue artifacts on the contours of persons.
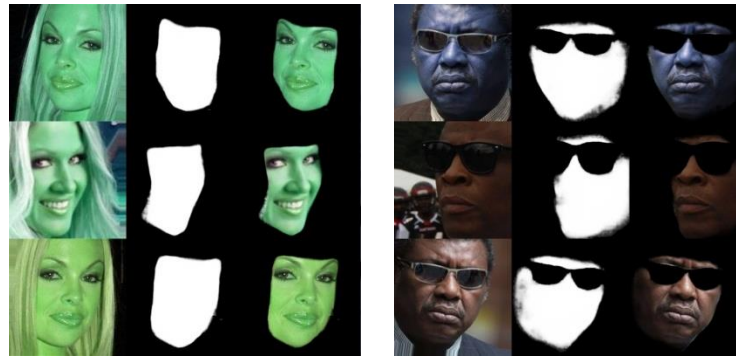
| Learned | Dst | FAN-prd | FAN-dst |

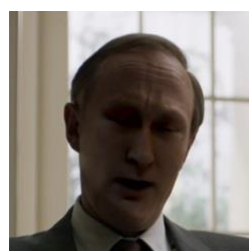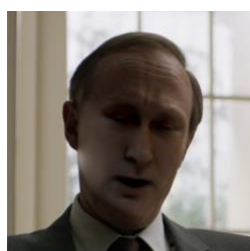`Choose erode mask modifier [-200..200] (default 0):`

Specify how to reduce the size of dst mask. The value of <0 - expand mask. This adaptive value, not absolute.

-100   +100

`erode mask modifier` *also reduces flicker in seamless mode,*

```
Choose blur mask modifier [-200..200] (default 0):
```

You specify how smooth dst mask. The value of <0 - reduces aliasing default models H64 and H128. This adaptive value, not absolute.

```
                            -200  +200
```



```
Hist match threshold. [0..255] (default - 255):
```

Reducing the value suppresses artifacts for histogram equalization modes.

```
                       (Default) 255  231
```



```
Choose output face scale modifier [-50..50] (default 0):
```

change the scale of the output face in the range -50 to + 50%. It is useful when the person predicted slightly more original.

```
                            -50  50
```



```
Apply color transfer to predicted face? Choose mode (rct / lct skip: None):
```

further adapt the complexion using rct or lct algorithm

```
                       Dst face  predicted face
```



```
                           rct  lct
```

Choose sharpen mode:

Select mode to increase sharpness usual method sharpen.

Choose sharpen amount [0..100]:

What amount sharpen apply.

Choose super resolution mode:

Select "higher resolution" mode for increased image detail. Slightly improves the clarity of edges, such as around the eyes.

No Yes

Degrade color power of final image [0..100] (default 0):

The degree of degradation of the final color image from 0 to 100. By reducing the overall quality of pictures can be hidden overlay facial imperfections.

0 100

```
Export png with alpha channel? [0..1] (default 0):
```

exports only person with an alpha channel for further work in the video editor.

The result of the imposition of individuals.

At the beginning of the debugging process, try different settings and observe the result.

Make sure to rememebr the appropriate values - run without the imposition of debugging.

Result images in workspace \ data_dst \ merged - can be used in most video editor, or glued to video in claim 8

`8) converted ... bat` Glued to the video.

The following .bat files glue the picture in the video with the same sound and FPS that data_dst.mp4 - so do not delete data_dst.mp4 of workspace folders.

`to avi.bat`

in .avi format

`to mp4.bat`

in .mp4 format

`to mp4 (lossless + alpha) .bat`

in .mp4 lossless format using alpha channel.

`to mov (lossless + alpha) .bat`

in .mov lossless format using alpha channel. Sony Vegas using QuickTime can use the alpha channel from the. mov file.

Everything. The result in the workspace \ result.mp4

If the result is not satisfactory, you can try different blending options, or to continue to train to improve the clarity, or to try a different model, or try a different starting person.

Additional Information:

`9) util convert aligned PNG to JPG (drop folder on me) .bat` – allows you to convert a folder with the extracted PNG faces of the older versions DeepFaceLab to JPG. To do this, drag the folder to a set of individuals directly on the .bat file.

There are cases when Windows 10 reserves a certain percentage of video memory, even if the card is not used to display an image. In such a case you have to sacrifice something for the training run (batch size, dimension in SAE, etc.).

Tips and Tricks.

Narrow face better trained on the broad face. That's why fakes with Cage are so popular.

Sometimes if the neural network will receive dst face only one light, for example, Shadowed nose, with src persons do not contain the same person with the same lighting, the neural network can not understand where all looking face at some angles, resulting in a predicted face It will contain a wrong turn heads.

In this case it is useful to add to the training set data_dst \ aligned faces of the same character, but learned from other scenes with different lighting.

It is thus possible to improve somewhat the result. But best of all, of course, find src face with the same coverage of the nose.

Advanced tips from @ GAN-er (in English):

Tip 1:

You may benefit by starting with a small batch size (within reason) and increasing it later. The reason is that a ** large batch size will give you a more accurate descent direction but it will also be costlier to calculate **, and when you just start, you care mostly about the general direction; no need to sacrifice speed for precision at that point. There are plenty of sources discussing the batch size, as an example you can check this one:

https://stats.stackexchange.com/questions/164876/tradeoff-batch-size-vs-number-of-iterations-to-train-a-neural-network

Tip 2:

Unlike the batch size that the only thing that does is affecting how accurate each step will be as far a the true gradient goes, the dimensions, actually, increase the complexity of your NN. As a rule, ** the more complex a network the better the resulting model **, but since nothing comes for free, ** the more complex the network the more time it will take to converge **.

What you generally want is to ** _ figure out the max dimensions that you can use _ ** given your GPU's memory, and your desired max batch size.

You can set the max batch size to something, say K, and then increase the dimensions until you get OOM errors. In the end, you will end up with a triplet, {batch size, ae_dims, ed_dims}

Ideally, you would use 1024 and 85 for your autoencoder and encoder / decoder dimensions, but no card has enough memory for such a configuration even with batch size 1.

Remember that unlike batch size that you can change at will, once you set up the dimensions you can not change them.

Note that ** if you use a complex - high number of dimensions NN, in combination with a small batch size, it will take _considerably_ longer for your model to converge **. So keep that in mind! You will simply have to wait longer, but also you will get a much much better result.

For cards with 11Gb of memory, and for SAE you can try the following settings:

For DF architecture: 12698 51 For LIAEF architecture: 8402 47

Tip 3:

If you end up being stuck, ie the loss does not go down but for no obvious reason or if you get weird artifacts in some previews before you discard and start from scratch, you may want to flip your DST and SRC for a while. This often is all you need to keep things going again.

Tip 4:

99.995% of your success or failure rate is due to bad SRC or DST sets. This means that 99.995% of your time should be spent in actually ensuring that your sets are well curated. Throwing together a hot podge of material and expecting a decent outcome is guaranteed to result in disappointment. Garbage in, garbage out.

Additional description of SAE.

This model in fact contains all the other models, if you disable style training and `multiscale decoder`.

SAE is very flexible, and can be adjusted either by a better generalization of network entities, or under better image clarity, or just to cash in on your GPU.

If src assembly of persons contains the number of persons greater than dst, the model can not converge. In this case, use the option Feed faces to network sorted by yaw, but only if the person dst do not contain hair, covering the jaw, because yaw is calculated is not right for such persons.

If src person's face is wider than dst, then the model cannot converge. In this case, you can try a src face scale modifier option of -5.

DF architecture makes the face more like the src, but if the model does not fit, use liae.

If your video card is a lot of video, you can choose between a large batch size, which improves the generalization of persons and Encoder / Decoder dims dimensions that improve picture quality.

Face style trains to move complexion, lighting, make-up. If he has already moved well, it continued training with a high score can make artifacts. Typically decrease value of 0.1 leads to stabilization of the workout.

Background style trains, to transfer the facial contour and the environment. Due to the contour of the face, adapted src face under dst circuit.

How can SAE be best trained with style? There is no perfect solution, it all depends on the stage. Experiment style with values ranging from 10.0, and then reducing the value to 0.1-2.0 after 15-25k iterations. Enable write preview history and track changes. Make a backup file every model 10k iterations. You can roll back the model files and to change the values if something went wrong in the preview stories.

Build on AMD / Old NVIDIA / IntelHD cards.

DeepFaceLab supports older processors without AVX instructions. To do this, use the DeepFaceLabCUDA9.2SSE assembly.

DeepFaceLab supports AMD, IntelHD Graphics and any old GeForce graphics cards through the use of OpenCL 1.2 engine.

To do this, use the DeepFaceLabOpenCLSSE assembly.

Note: operating on OpenCL compared to CUDA has some drawbacks:

- Extraction of persons can only be run or MT S3FD, with the first pass (1st pass) on the MT will still work on the CPU, but fast enough! S3FD runs completely on OpenCL and is the preferred method. The second pass is working on OpenCL without problems.

- To start the SAE, it needs to be cut back significantly in ae_dims, ed_ch_dims and the batch size in comparison with the same amount of video memory on the CUDA version.

- You can put even the most minimal value, as well as the resolution of 64 and half face - as a demonstration natreniruete fake inferior quality even IntelHD Graphics with 256MB of memory with no problems!

- After saving in the process of training for each training run, OpenCL will restart your routines and take some time.

Development Donations

If you like this program, please consider donating money to support further development.

Yandex.Money: https://money.yandex.ru/to/41001142318065

Paypal: https://www.paypal.com/cgi-bin/webscr?cmd=_s-xclick&hosted_button_id=KK5ZCH4JXWMQS&source=url

Bitcoin: 31mPd6DxPCzbpCMZk4k1koWAbErSyqkAXr

Useful Links

Development Page	https://github.com/iperov/DeepFaceLab
Instructional Video Tutorial	https://www.youtube.com/watch?v=K98nTNjXkq8
My Channel Fakie	https://www.youtube.com/channel/UCEtoVzBLuE-ni-54h7kYvsg
Popular Channel Fakie	https://www.youtube.com/channel/UCUix6Sk2MZkVOr5PWQrtH1g/videos
Fakes on Reddit	https://www.reddit.com/r/GifFakes
Readily available src kits for people	https://mega.nz/#F!y1ERHDaL!PPwg01PQZk0FhWLVo5_MaQ
Search for a suitable celebrity face to be downloaded	http://www.pictriev.com
Find a suitable person for the a porn star	https://findface.sex/ru https://findpornface.com https://pornstarbyface.com http://www.didshedoporn.com