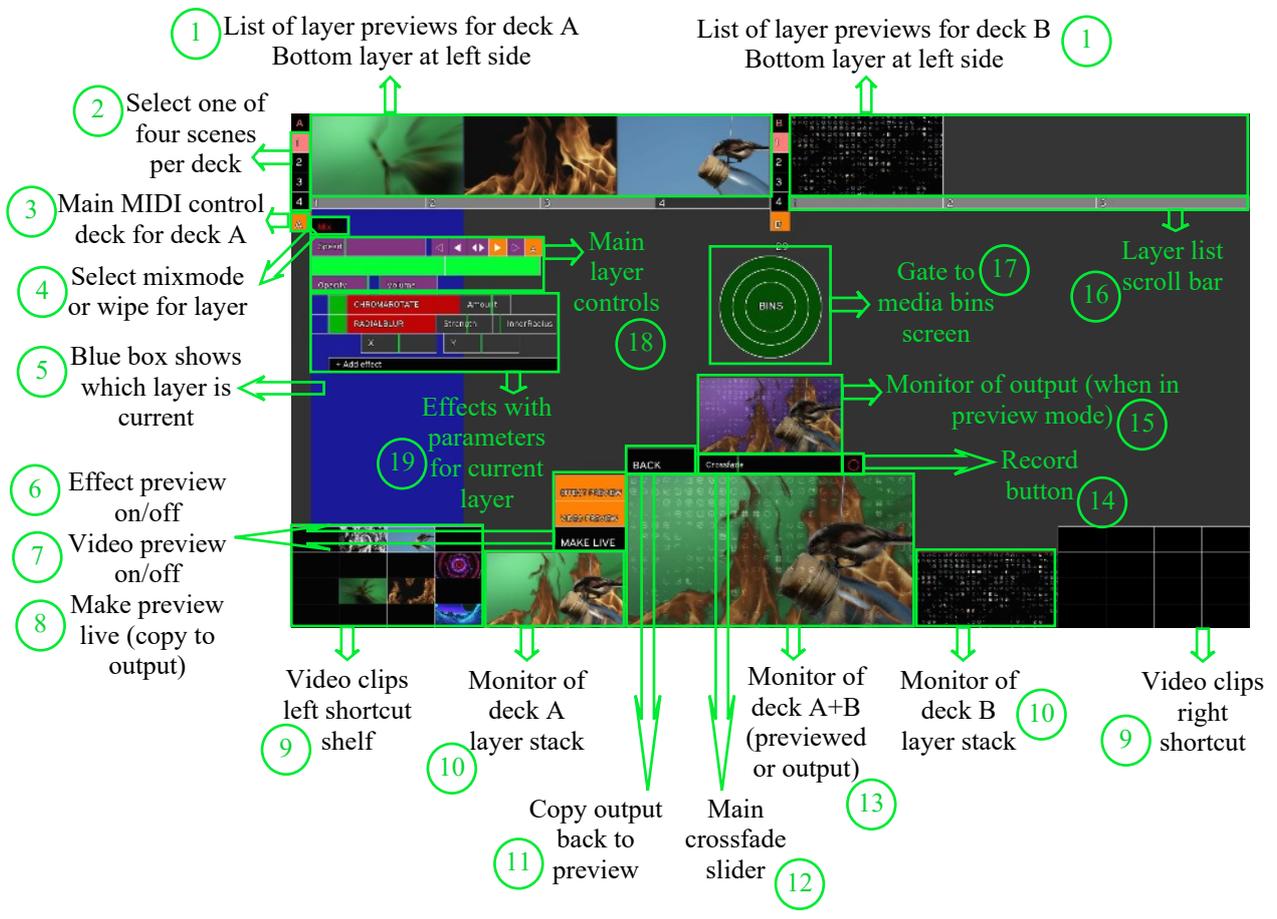# EWOCvj 2

EYES WIDE OPEN CREATION

©by Gert De Roost     paleajed@gmail.com

*"an open source*

*VJ program"*

alpha release

**1** List of layer previews for deck A. Bottom layer at left side

**1** List of layer previews for deck B. Bottom layer at left side

**2** Select one of four scenes per deck

**3** Main MIDI control deck for deck A

**4** Select mixmode or wipe for layer

**5** Blue box shows which layer is current

**6** Effect preview on/off

**7** Video preview on/off

**8** Make preview live (copy to output)

**9** Video clips left shortcut shelf

**10** Monitor of deck A layer stack

**11** Copy output back to preview

**12** Main crossfade slider

**13** Monitor of deck A+B (previewed or output)

**10** Monitor of deck B layer stack

**9** Video clips right shortcut

**14** Record button

**15** Monitor of output (when in preview mode)

**16** Layer list scroll bar

**17** Gate to media bins screen

**18** Main layer controls

**19** Effects with parameters for current layer

## Important: rightclick an empty spot onscreen to get to the programs QUIT function!

## I. Main mix window overview

1. Layer list

Along the top of the screen are the monitor lists of layers that constitute the main program video mix structure. There are two layer stack lists, one on the left (called deck A) and one on the right (deck B). These two constitute separate stacks of layers, which afterwards are combined into one A+B video preview/output (see 12. Crossfade and 13. A+B monitor) The first layer of each stack, which lays on the bottom of that stack is positioned on the left of the list. Each following layer is put on top (over) the combination of layers below it, using a certain mixmode or wipe (see 4. Mixmode/wipe) that prescribes the method of combination. Each layer is made up of a loaded video clip or live video input, and the video effects that are used to change certain video characteristics (see 19. Effects box). The image viewed in the layer list is taken after all effects have been applied. When more than the displayed three layers per deck are stacked, you can use the scroll bar to shift your view position in the list (see 16. Layer scrollbar). Hovering the mouse over a layer monitor will select that layer as the current layer and its settings will be displayed. This hovering is the default behaviour but can be set to leftmouseclicking in the preferences window.

Right clicking one of a certain layer monitor views accesses the layer menu. Selecting and clicking "Connect live" will display all possible live input sources (eg. a webcam). Clicking one will connect the source to the layer, displaying it. One same source can be opened in any number of layers. Second menu option "Open video" will open up a file browser that allows you to open any video file in that layer (see also III. A note on video formats and VJ'Ing). Third option "Open layer" allows you to open a previously saved layer file (see II.4). It will end in the suffix ".layer". A layer file includes all control settings and also the layers effects settings. Fourth option allows saving a layer file (see II.4). Fifth option "Delete layer" removes a layer with all its settings from the layer list. Last option "Center video" allows to recenter the image after panning.

Clicking + dragging the white semi-transparant small box that appears in the center of a layer monitor when hovering your mouse pointer over it, allows you to pan (move) the video image. The layer right mouse menu contains an option to recenter the image. Using the mousewheel when hovering your pointer over a layer monitor will scale up

and down the video image. When hovering over the right side border of a layer monitor will display two thin boxes, a blue and a red one. Left-clicking the red one will delete the layer left to it while clicking the blue one will insert a new layer at the box position.

It is possible to reorder layers. Two possible operations, moving or swapping. To move a layer, leftclickdrag it (make sure not to click on the pan box) and anywhere between or just next to another layer monitor box and drop it there. A light blue box will appear signifying you are correctly aiming between and not onto another layer(s). To swap leftclickdrag and drop a layer in the middle of another layer monitor box. Those two layers will be swapped. Moving and swapping can be done between A and B deck or inside one off the two decks. One important detail: when swapping, the settings of the layers mixmode/wipe will not be swapped also. But when moving a layer, the layers mixmode/wipe WILL be moved together with it. To swap with mixmode/wipe change do two moves instead.

Every layer has its own clip queue, its a list of videos and/or layer elements (see II.4) thats played in succession. When one video reaches its end, the next will play. When the last video plays, the first will play again after it. Note both play and reverse play avance forward in the clip queue, while bounce play will not trigger the clip queue at all. Drag a video or layer from anywhere in the program over a layer monitor, and its clip queue will roll open downwards. Drop the new clip in an empty clip slot or replace an other clip with it (by dropping it on a clip in the queue) or insert it between two other clips in the queue. Use the mousewheel to scroll the clip queue up or down. You can drag'n'drop between clip queues also. When finished setting up clip queues left click anywhere in the screen to cancel queue setup. Also open any layers clip queue by doubleclicking a layer monitor.

2. Scene boxes

On the left of each layer list (see 1. Layer list) there are four square boxes labelled 1 through 4. They allow you to select the current scene that plays in the deck (A or B). A scene is a separate set of layers (stack/list) with all its settings preserved when switching. All layers in non-active scenes continue playing (forward, reverse, bounce) like they were so synchronization is always kept between scenes. Video loading/decompressing is not done on the non-active layers, so they wont strain your system.

3. Main MIDI deck

The MIDI control in EWOCvj 2 is split in two separate parts. First, you can learn individual MIDI commands to certain parameters (see 19. Effect box). Second is the main MIDI control deck and individual MIDI control deck settings on the layers. A bit more difficult to explain, a main MIDI control deck is a set of MIDI controls assigned to the main controls of a layer (see 18. Main layer controls), like play speed, play on/off, next frame,... There are four of these sets, labelled A, B, C and D and clicking the main MIDI control deck box will switch between them (or switch them of) for ALL layers of the deck (A or B, thats the layer deck I mean, not the MIDI deck). Individual layer MIDI control deck settings can be done, allowing for instance one layer to follow other/no controls after this. Right-clicking either main MIDI control deck box will allow you to choose "Tune MIDI deck", opening a new window that allows setting up the current MIDI control deck (so A, B, C or D). So FIRST you set up a certain MIDI control deck here, then assign it to a certain layer deck or individual layer. The tuning window shows settings SPEED (play speed), ONE (set play speed to normal for sliders with "center" MIDI command), FREEZE (pause play when touching scratch wheel), SCRATCH (scratch forward/backward wheel movement), OPACITY (layer opacity) and buttons with symbols for PLAY, REVERSE PLAY, BOUNCE PLAY, FRAME BACKWARD, FRAME FORWARD (see also 18. Main layer controls). Leftclick a box/circle to enter learning mode. Now move the MIDI control you want to use and it will be set. (Rightclick exits the learn message). Test by using the assigned MIDI control, the respective box in the tuning window should turn green. Close the tuning window to return to main program. Settings will be saved.

4. Mixmode/wipe

Clicking this box will open a two choice menu. Either choose a mixmode or a wipe that will be used to control the way the layer will be combined with the lower layers in the stack (see 1. Layer list). A mixmode will mainly be a mathematical blendmode that constitutes the math that mixes two images. Normal mixing is called "Mix". When in Mix mode there will be an extra slider called "Factor" it allows you to locally crossfade between the layer and its lower layers. The other math settings I will not explain here, something to try out to get to know them really.

One other is CHROMAKEY, which allows you to substitute a certain color of the image by the image of the lower layers. When CHROMAKEY is set, extra controls will appear next to the mixmode box. "Color" will allow you to set the color substituted. Use the color hue wheel (with saturation/lightness triangle) to choose or move the mouse over any spot in the window (any) and leftclick to select the color under the mousepointer. This allows selecting from video monitors. Then "Tolerance" allows to select a certain range of colors slightly different (upto all colors) to be substituted also. Then theres switches "D", which reverses the direction of the substitution (so a color in the bottom layers is substituted by the current layer instead of the other way around) and "I", for inverse, which substitutes everything *except* the selected color.

Then, "Displacement" setting will use the layer video to spatially "displace" the bottom layers image.

When wipes are selected you will have a selection of shape-steered wipes with associated directions that can here be used to do shape compositions instead of mathematical mixes. For a list of wipes, see 13. A+B monitor. Use the "Factor" slider next to the mixmode/wipe box to travel the wipe betwwen 0 and 1. See "10. Deck monitor" for more on wipe settings.

5.  Current layer

When hovering the mouse over any of the six displayed layer monitors, this specific layer will become the current layer, visualized by a screenhigh big dark blue rectangle in the background. Main controls and all effects plus parameters for the current layer will be displayed. This hovering is the default behaviour but can be set to leftmouseclicking in the preferences window.

6.  Effect preview on/off

This on/off button turns on/off the effect preview. For an explanation on the preview system, see 8. Make live. Effect preview is on by default, when turning it off all previewing is turned off, video preview also. When off, you are switched to the running output video streams, entering a direct live performance mode where all changes made go directly to the output. So you can directly visualize for instance MIDI knob changes to some effect parameter. One other advantage is, there will be only one video mix stream calculated (the output stream), removing stress of the extra preview stream from the system.

7.  Video preview on/off

When on, different videos can run in preview and output streams. When off, all changes to choice of playing videos will be made to both preview and output. Turned off when effect preview is turned off.

8.  Make live

Momentarily updates the output of the video mixing stream with the one in the preview stream. EWOCvj 2 features a preview system, on by default (see 6. Effect preview on/off and 7. Video preview on/off), that allows the performer to make changes to videos and effects, without them altering the current output stream at all. In fact there are two separate video pathways, one for preview and one that is sent to the output. This allows one to make a setup and then click the MAKE LIVE button to make it live. One disadvantage is the doubling of processing power by the computer system. The BACK button (see 11. Back) does the opposite, copy live stream to preview stream.

9.  Shortcut shelf

Empty on startup. Videos or layer files can be dragged on here from anywhere to create a bank of shortcut media. Leftclickdrag them to a layer monitor or empty space in the layer list (see 1. Layer list) to load that video/layer file into the layer list. Not yet triggerable by MIDI.

## 10. Deck monitor

All layers in the deck A or B list/stack are combined using the set mixmodes/wipes. The result of these two stacked combinations (A and B) are displayed in their respective deck monitors. When rightclicking the deck monitor a menu appears allowing its contents to be displayed on external connected display devices. When using some of the wipes between layers in the layer stack (see 1. Layer list), certain settings can be made to the wipe by leftclickdrag on the deck monitor when the layer with that wipe is current. Namely RECTANGLE, ZOOMED RECTANGLE and ELLIPSE allow center of rectangle/ellipse to be set, while for BARS and PATTERN the x and y divisions are changed. Use the Factor slider on the layer to travel the wipe setting from 0 to 1.

## 11. Back

Read "8. Make live" for an explanation on the preview system. When clicking the BACK button, the current output stream is copied back to the preview stream, allowing one to make changes live with effect preview turned off (see 6. Effect preview on/off) and then continue working with preview from where you ended up after going live.

## 12. Crossfade

This main crossfade slider is used to crossfade the image in the A+B monitor (see 13. A+B monitor) between the images in deck A, respectively B. Also does the travel of the A+B monitor wipe between 0 and 1 when such a wipe is set (see 13. A+B monitor).

## 13. A+B monitor

The A+B monitor shows the image of deck A output and that of deck B, combined using a standard crossfade or one of the available wipes. Default crossfade, choose something else by rightclicking and navigating the menus. The crossfade is controlled by the crossfade slider (see 12. Crossfade). The wipes are transient shape combinations, allowing either creating a moving wipe from deck A to deck B or to do some intermediate composition of the two decks. The wipe travel from one to the other position is also controlled by the main crossfade slider (see 12. Crossfade). In the menu, you'll have to select the wipes direction: either from left to/from right, up to/from down, in to/from out. The directions are set going from deck A to deck B. The available wipes are:

CROSSFADE: Back to the default crossfade mixing.

CLASSIC: A line travels over the image, showing part of deck A on one side and part of deck B on the other.

PULL/PUSH: A line travels over the image, pulling in deck A, pushing out deck B.

SQUASHED: A line travels over the image, squashing the deck images in the available space on either side.

ELLIPSE: A growing/shrinking ellipse is shown, revealing one deck image, the other deck image on its outside. Select ellipse center by leftclickdragging on the monitor.

RECTANGLE: A growing/shrinking rectangle is shown, revealing one deck image, the other deck image on its outside. Select rectangle center by leftclickdragging on the monitor.

ZOOMED RECTANGLE: A growing/shrinking rectangle is shown, one deck image zoomed full size inside, the other deck image on its outside. Select rectangle center by leftclickdragging on the monitor.

CLOCK: A line through the monitor center rotates, revealing deck B.

DOUBLE CLOCK: Two perpendicular lines through the monitor center rotate, revealing deck B.

BARS: Multiple bars horizontal or vertical do a multiple CLASSIC wipe (see above). Set bar divisions by leftclickdragging on the monitor.

PATTERN: Multiple boxes horizontal and vertical do a multiple CLASSIC wipe (see above). Set pattern divisions by leftclickdragging on the monitor.

Also rightclick menu allows sending the A+B monitor imagery to any connected external display.

When effect preview is on, the A+B monitor will show the preview stream and the output monitor the output. But when effect preview is off, the A+B monitor will show the output and the output monitor will not be shown.

14. Record button

With MAKE LIVE (see 8. Make live) clicked at least once or in output live mode (see 6. Effect preview on/off), this button will appear, which will, when clicked, start recording a video of the output stream to disk. The directory in which this is done can be set in the preferences window. Default is ".\recordings". When clicking the button again (the red circle will be full when recording) the recording will stop. Every recording session will go into its own, numbered, video file. Recording video format will be an MJPEG mov, watch your disk space!

15. Output monitor

Displays the output video stream (see 8. Make live). But when effect preview is off (see 6. Effect preview on/off) it will not be displayed; the A+B monitor will then display the output (see 13. A+B monitor). Rightclick menu allows sending the A+B monitor imagery to any connected external display. This will be where you set up eg. your beamer for outputting your show.

16. Layer scroll bar

This bar shows the displayed layer numbers and allows scrolling of the layer list (see 1. Layer list) when there are more than the displayable three layers in any of the decks A or B. The grey area of the bar displays the layer numbers of the three layers currently displayed and black areas mean space occupied by non-displayed layers. Leftclickdrag the grey area of the scroll bar into the black area and the list of layers will be scrolled left or right one by one. Take care, the bar moves in steps (no continuous movement) so you'll have to move at least the length of one layer before the bar will be seen moving. Also space for another layer will only be created when the current list is full, or you can create new layers explicitly (see 1. Layer list).

17. Gate to media bins

This big circle is the gateway (wormhole) to the media bins screen, a separate screen (see Media bins screen) that allows content to be stored/loaded/arranged. Leftclicking the gate circle will take you to the bins screen and back. Also content (layers/shortcut videos) can be dragged into the gate circle, causing an automatic screen switch, so you can store/arrange this content in the bins screen. Also dragging layers/decks/mixes (see II.4/6/7) from a media bin into the current mix (through the gate circle) is possible (see Media bins screen).

18. Main layer controls

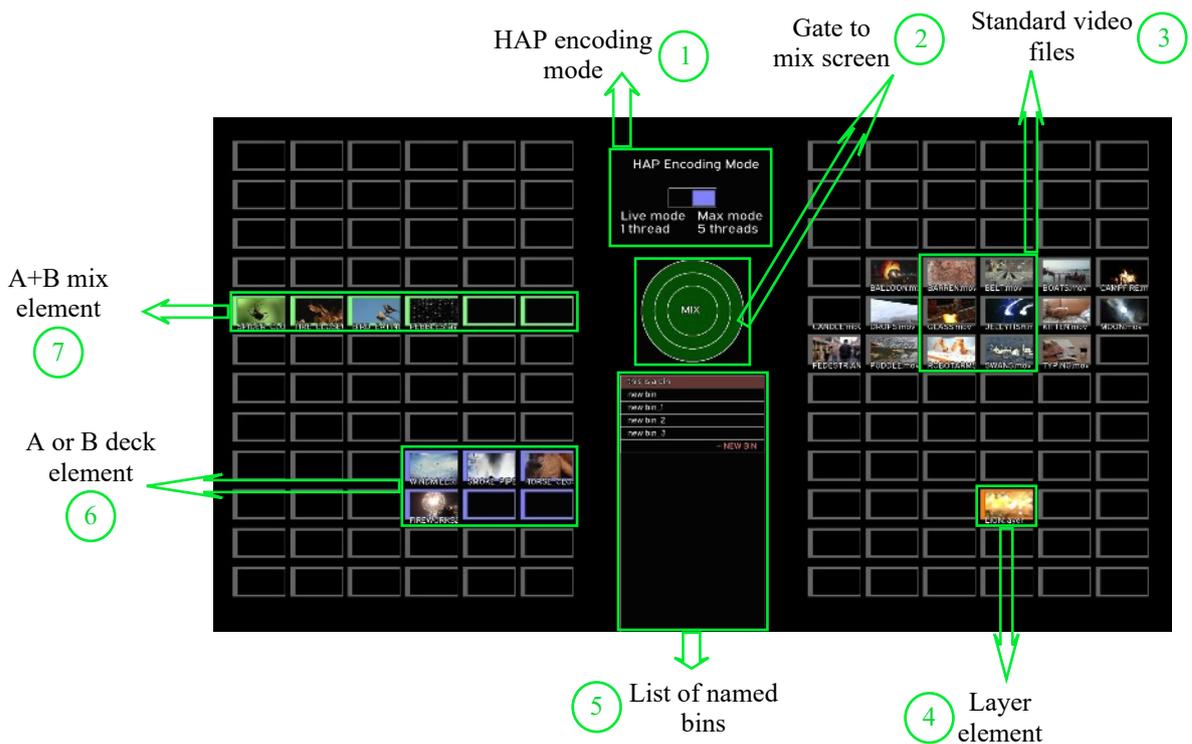When selecting the current layer (see 1. Layer list), its main layer controls will be displayed.

The "Speed" slider allows setting a slower or faster video playback speed. The little white line inside the slider box is normal speed. Then theres five buttons starting with "<" and ending with ">". They are respectively: first, move one frame backward (also triggered by left cursor key), second play/stop video backward, third play/stop video bounce, which means from start to end and then from end to start and so on, fourth play/stop video normal (also triggered by spacebar) and fifth move one frame forward (also triggered by right cursor key). All playing loops.

Second row is the video position/loop bar. Its length is the current video length, the position of the (moving) white line the video position. Leftclicking on the bar will set current video position there. Leftclickdragging allows video/audio scrubbing. (Is your scrubbing not fluid? Read III. A note on video formats and VJ'Ing) Rightclicking the bar allows to set the current position as loop start or end; the selected loop is shown as the green part of the bar.

Third row has the opacity slider, changing the opacity of the current layer.

19. Effects box

Contains all information/controls of the effects list assigned to the current layer (see 5. Current layer). Effects change certain visual aspects of video clips in very different possible ways. Effects are applied in a list, each next effect changing the image already changed by the previous effects. First effect displayed on top off the list. On the bottom of the list (which starts out empty) theres a "+Add effect" box. Click it and an effect choice menu will pop up allowing you to add an effect to the end of the list. Hover your mouse pointer on the border of an added effect item and an "Insert effect" box will pop up allowing inserting a new effect somewhere in the list. Click on the name of an added effect to get a menu allowing changing the effect type, or delete the effect (top item of menu). Just left of the effect name there are two boxes: the left one being a small dry/wet slider allowing crossfading between the non-effected image and its effected counterpart, the right one being a simple on/off switch. Most effects have one or more parameters, that change the effects, well, "effect". Those can span multiple rows. A list of available effects plus parameters will be added to the documentation later on, for now, experiment! All effects in EWOCvj are being calculated on the GPU.

**HAP encoding mode** ①

**Gate to mix screen** ②

**Standard video files** ③

**A+B mix element** ⑦

**A or B deck element** ⑥

**List of named bins** ⑤

**Layer element** ④

## II. Bins window overview

The bins window, that can be reached by clicking or otherwise entering the green gate/wormhole circle in the middle of the screen, is a screen that visualizes the bin structures that house and arrange the different elements that EWOCvj 2 can load/save. A bin is a one-screen visual structure that consists of two (left and right) grids of 12x6 elements. Each grid element can contain a thumbnail of either a video file or a layer file(which can itself be contained in a deck or mix file element). This way you can arrange different visually assembled file sets with very different purposes each. Every change made to a bin will be saved to disk straight away, so there is no need for doing this explicitly. Bin elements can be hovered over, showing if it decompresses on CPU or GPU, the video resolution and when hovered over, the video of a bin element (sometimes with all its corresponding effects) will be previewed in the spot of the HAP encode mode switch. Using the mousewheel when hovering over an element will fastforward the preview movie.

1. <u>HAP encoding mode</u>

Read about the HAP video format at II.1 and II.3. HAP is the recommended file format for EWOCvj videos as it compresses on the GPU, although file sizes are rather substantial. EWOCvj 2 allows transcoding your private video collection to HAP format in-program. This is done in the bins screen. First, you can rightclick a video file in the bin and select "HAP encode element" in the menu. The text "Encoding…" will appear in the thumbnail together with a progress bar. When finished a new video file ending in "_hap.mov" will have been created in the same directory as the source video. Also the thumbnail will now refer to the HAP version instead of the original. Then you can rightclick a layer file also. This is the same process as with normal video files, except the layer file will be replaced by a new one with the same name, but referring to the newly created HAP file. Same goes for rightclicking deck or mix files. Every single video in those files will be converted and the deck/mix file replaced by a new one referring to the new HAP videos. Of course videos that are already in HAP format will not be converted. Also files that are queued for transcoding will display "Waiting…" on the thumbnail. There are two modes for transcoding: Live and Max, as shown in the above screenshot. Leftclicking the switchknob will select one of the two. Live modus transcodes files one thread a time, which leaves at least some CPU power for the mainprogram, allowing for transcoding while performing with the main program. Max modus allows one to use a number of threads equal to the number of CPU cores you have plus 1. This is the ideal amount for mass-transcoding your files but consumes 90% of your CPU power… When hovering over a thumbnail, HAP movies will display "GPU" on the thumbnail instead of "CPU". Do note HAP files created with EWOCvj 2 are without sound, the program does not support HAP with audio.

2. Gate to mix screen

Behaving like the gate on the mix screen, this one goes back to the mix screen and allows, like layers can be drag'n'dropped to the bins, different bins elements to be drag'n'dropped to the mixscreen. Drag a video file or layer element into the gate, and the program will switch to the mix screen, allowing content to be dropped into a layer or into a clip queue of a layer. Same goes for deck files, which can be dropped anywhere in the layer space of deck A or B. One special thing are mix files, they are dropped straight on the gate circle, since they always replace everything in the current scene.

3. Standard video files

Standard video files can be loaded into the bin grid by rightclicking on an empty spot on screen and selecting either "Insert file(s) from disk" or "Insert dir from disk". Both will display a file browser, one allows for selecting one or multiple files, the other allowing selection of an entire directory. Once selected, you must hover your mouse over some element of the grid to display the selected file thumbnails. Move your mouse until satisfied, then leftclick and the files will ben put in the bin. Standard video files have only a grey border. Leftclick a file element in the bin and move mouse to another element to either move the file element to an empty box, or swap it with some other file or layer element (you can't place it into deck or mix elements). Leftclick affirms. Read II.2 on how to move an element to the mix.

4. Layer elements

EWOCvj 2 uses the concept of "layer files" to assemble all parameters of a certain layer you set up in the mixing part into an open- and saveable file format. So its effects plus parameters plus its playing state plus its loop settings and all other settings will be saved together, allowing reuse of entire layer setups. You can drag layers with leftmouse from the layer monitors on the mix screen into the center gate circle and then drop them in one of the bin grid boxes. A layer file box in the bin always has an orange border. Read II.2 on how to move a layer element to the mix. Leftclick a layer element in the bin and move mouse to another element to either move the file element to an empty box, or swap it with some other file or layer element (you can't place it into deck or mix elements). Leftclick affirms.

5. List of bins

The center box contains a list of all your bins. When first starting there will be one empty bin called "this is a bin". You can add bins to the end of the list by clicking the "+ ADD BIN" box. Limited functionality at the moment includes deleting and renaming a bin through options in the rightclick menu (click the bin name).

6. Deck elements

EWOCvj 2 knows, alongside layer files also a deck file structure. Its an assembly of all the layers files (layers + settings) contained in either the A or B deck in the mix. All the information of the decks setup can be saved/opened together. By using the rightclick menu anywhere in the bins screen, you can select "Insert deck A" or "Insert deck B" to add deck A respectively deck B into the bins grid. Move the mouse over an empty space somewhere and the different layers in the deck will appear inside the boxes. Note that the shape of the deck element will always be three boxes wide and have a height thats one more for every three layers in the deck. Also note that the deck element will always be aligned either to the left border of the bin grid or positioned at horizontal positions 4, 5 and 6. A deck file element will have a green border and the whole of the deck element will have a green box around it. Leftclick a deck element in the bin and move mouse to another element to move the file element to an empty space (which must be big enough to contain the deck element). Leftclick affirms. Read II.2 on how to move a deck element to the mix.

7. Mix elements

EWOCvj 2 knows, alongside layer and deck files also a mix file structure.  Its an assembly of all the layers files (layers + settings) contained in both A and B decks together; so, the entire active mix (without inactive scenes).  All the information of the mix setup can be saved/opened together.  By using the rightclick menu anywhere in the bins screen, you can select "Insert full mix to add the current active mix into the bins grid.  Move the mouse over an empty space somewhere and the different layers in the deck will appear inside the boxes.  Note that the shape of the deck element will always be six boxes wide and have a height thats one more for every three layers per deck.  So it will fill the entire grid width, deck A positioned to the left and B to the right.  A mix file element will have a lightpurple border and the whole of the deck element will have a lightpurple box around it.  Leftclick a mix element in the bin and move mouse to another element to move the file element to an empty space (which must be big enough to contain the mix element).  Leftclick affirms.  Read II.2 on how to move a mix element to the mix.

# III. A note on video formats and VJ'ing

1. "Standard" video formats versus VJ suited formats.

EWOCvj 2 loads almost every video format through use of the ffmpeg framework.  Alas, not all formats are suited for VJ use.  Especially a lot of commonly heavily compressed formats are wrongly composed for VJ'Ing.  The most common eg. mp4 videos use a system using keyframes (full frames) and intermediate frames (containing the information that changed since the previous frame) to achieve high compression.  This is fine when playing videos forward frame by frame, but VJ use also plays videos backwards, scratches video back and fro like DJs do with music and often play videos very fast, regularly skipping frames.  For all these uses, keyframe-systems are not the way to go, cause to jump to any random frame means going to the keyframe before it, and decompressing all intermediate frames upto the wanted frame.  SLOW and skippy…  But EWOCvj 2 supports these formats also, since when playing the videos forward at normal to slow speeds works well (as long as the programs frame rate is not dropping too low).

VJ suited formats are those that have a compressed full frame for each and every frame, cause it allows jumping around without slowdowns.  Examples of these are MJPEG/PhotoJPEG on CPU and HAP for GPU.  Do mind these formats yield very big files.  When playing many layers, investing in an SSD is not an unwise move…

2. The old way - on the CPU

First you can use eg. MJPEG/PhotoJPEG to decompress videos on the CPU, your computers main processor.  This is limited in that decompressing many layers at the same time will soon tax the CPU and make the overall framerate drop, most certainly when using the preview system (see I.8. Make live).  Decompression is multithreaded, so having many processor cores will help greatly.

3. The latest way - on the GPU

A company named VIDVOX has developed a video codec named HAP, which allows the video to be mainly decompressed on the GPU (graphics card) instead of the CPU, offloading decompression stress.  This works very well enabling a LOT of video layers to be decompressed concurrently, especially when you have a fast modern graphics card.  HAP encoding supports transcoding to HAP from within the program.  Read more in II.1.  EWOCvj does not at the moment support HAP files with audio.