AVSCutter

AviSynth-based non-linear editing

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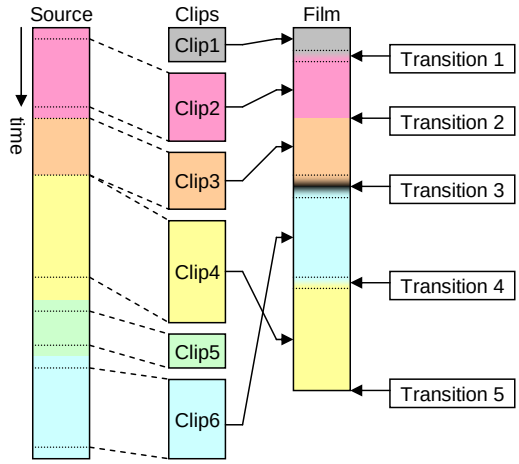
Content

1 What is AVSCutter?

AVSCutter is a “non linear editing” program for a video stream that is described in AviSynth-Commands. It generates a new video stream which is also described in AviSynth. The cutting commands can be stored in an AVSCutter-special project file.

The program allows to split the source video stream into clips and to combine the clips to a new video stream. Between succeding clips transitions can be specified:



Before you continue reading you should be familiar with the basics of AviSynth, see http://www.avisynth.org/.

Further a suitable player for AviSynth (AVS-Files) is required. I would recommend VirtualDub, see http://www.virtualdub.org/.

2 Acknowledgements

The AVSCutter program is highly inspired and supported by various freeware tools.

- Thanks to the people who develop AviSynth which was initially started by Ben Rudiak-Gould.
- Thanks to Avery Lee who develops VirtualDub, a great tool for video capture, playback an analysis.
- Thanks to all people who created the GNU compiler and its MINGW port that I used for compiling.
- Thank to the team around Bill Spitzak who offered their FLTK-toolkit that I used create AVSCutter.
- Thanks to Bruce E. Wampler who wrote the small but very efficient VIDE GUI for the GNU compiler (and more) that helps me in project management and debugging.
- Thanks to many other people who offer their projects free and with open source to the public.

3 Starting AVSCutter

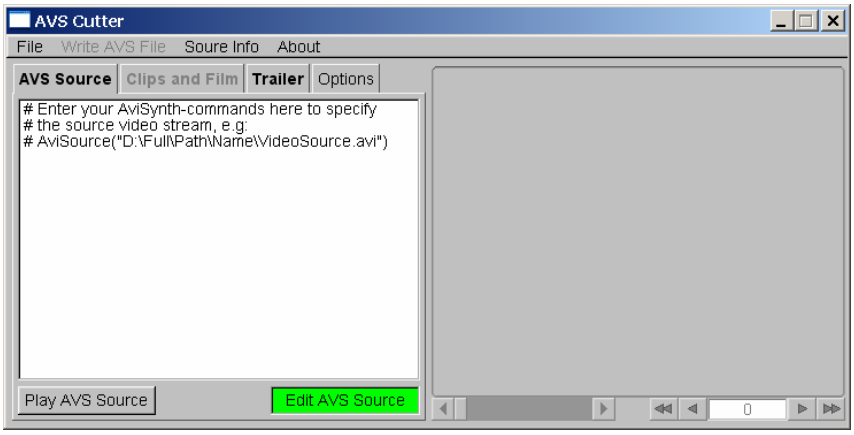
Before starting AVSCutter AviSynth 2.5 must be installed. See http://www.avisynth.org/ for download and installation instructions.

The Executable `AVSCutter.exe` can be started by clicking on the program icon. No installation is required. Nothing is written into the registry.

Alternatively it can be called from the command line with the name of a AVSCutter project file (extension “.cut”) as an optional parameter.

4 Specifying the source

After starting AVSCutter the main window appears with Tabs on the left side of the Window. The Tab “AVS Source” is activated. The source contains an editing box where AviSynth-Commands can be typed to specify the source video stream:



The source can be edited as long as the “Edit AVS source” button is down and looks green.

Initially some comment lines are filled in the edit box, which can be deleted when correct AviSynth source commands are inserted.

To preview the source video stream the “Play AVS Source” button can be pressed. Prior to the first preview the full pathname of the AVS-viewer (e.g. VirtualDub) must be set in the “Options” Tab (see below).

Examples:

If you like to cut “MyVideo.avi” in directory “c:\Capture” then enter the following AviSynth command:

```
AviSource("C:\Capture\MyVideo.avi")
```

If you like to combine two source videos “first.avi” and “second.avi” to one source stream then be sure that the parameters (width, height, framerate, ..) of both streams fit. If they do not fit, use AviSynth-commands to make them compatible. To combine the two compatible sources (directory “c:\Capture”) enter following AviSynth-command:

```
AviSource("C:\Capture\first.avi")
last + AviSource("C:\Capture\second.avi")
```

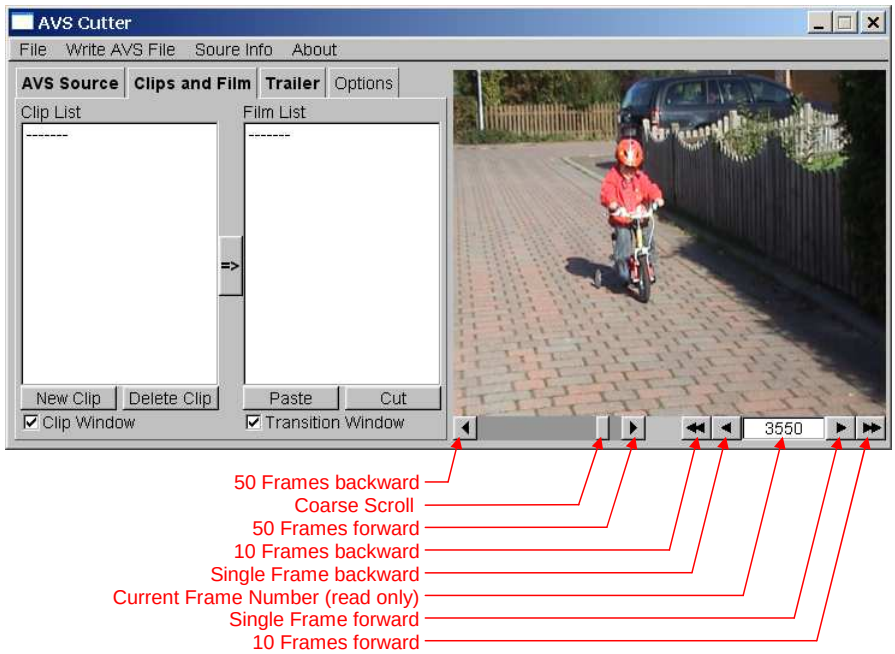
When the source stream is specified then the green “Edit AVS source” button must be pressed. The source is locked, the button becomes red color and the “Clips and Film”-Tab will be activated.

Warning: Be careful with source changes after clips have been defined. The clip definitions are based on frame numbers. If the frame numbers in the source change, the clips will not automatically adapted to new frame numbers.

5 Creating Clips

5.1 Navigating through the source

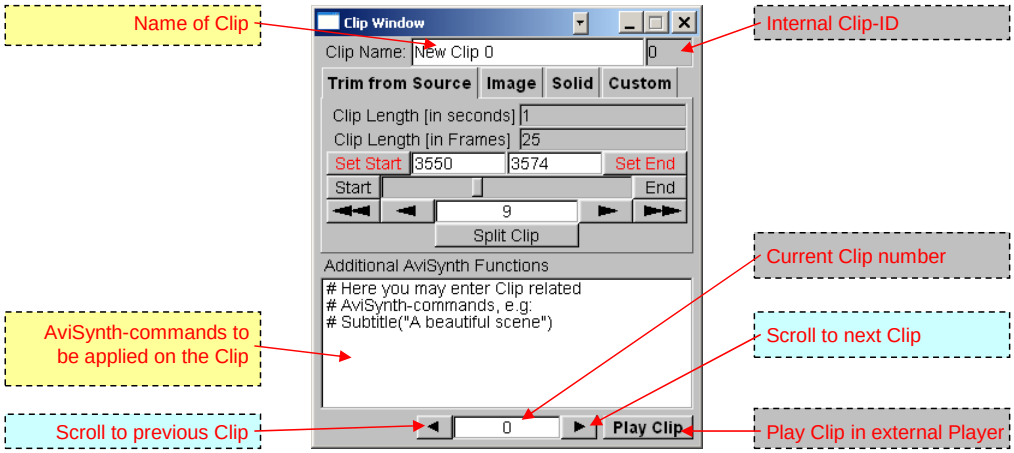
When the source is defined the video stream is shown in the image box at the right of the main window. You may scroll through through the source video stream using different navigation buttons. A slider supports coarse scroll and a counter fine scroll through the source. The counter also shows the current frame number of the source.



5.2 Defining a Clip

To define a clip the “Clips and Film”-Tab in the main window must be selected. At the left of the Tab an initial empty clip list is shown. To define a new clip press the “New Clip”-Button. It creates a new clip with the current frame number as the starting frame and a size of 25 frames. The Clip is added to the clip list directly behind the currently selected Clip. If no Clip is selected then the new Clip is added at the end of the Clip list.

When the “Clip Window” check box in the main window is activated then a Clip window appears:



The window has elements with three purposes:

- Clip information (marked gray)
- Clip navigation (marked blue)
- Clip modification (marked yellow)

The clip window contains elements which are common to all types of clips.

At the top of the window you find:

Name of the Clip: An edit box where a name for the Clip can be entered

Internal Clip ID: An internal Clip-ID which can be used to distinguish Clips with the same name.

At the bottom of the window you find:

AviSynth-commands to be applied on the Clip: An edit box allows the user to enter AviSynth-Commands which will be applied only on the related clip. This can be used e.g. for filtering the Clip or writing a subtitle.

Scroll to previous/next Clip: These buttons allow a fast sequential scroll through the clips.

Current Clip Number: This field shows the sequential number of the Clip. The first Clip has number 0, the second number 1 an so on.

Play Clip in external Player: The Clip is played with an external player which is defined in the options section of the main window.

5.3 Clip Types

In the middle of the Clip window Tabs are shown which are used to define the type of the Clip. Four Types are available:

Trim from Source: The Clip is trimmed from the source video stream. All elements on the Tab are used to scroll through the Clip or to set the first and last source frames which define the start and end of the Clip.

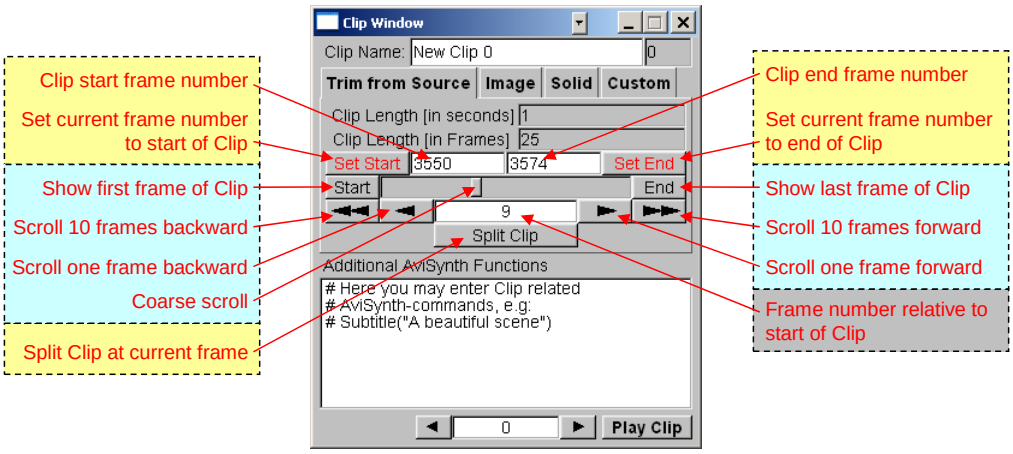
Image: The Clip is constructed from a static image. See more below.

Solid: The Clip has a constant static color which is selectable. See more below.

Custom: AviSynth-commands must be used to define a custom Clip. This requires good AviSynth knowledge.

5.3.1 Trim from Source Clip

This type of Clip is used to cut a snip out of the source video. The elements of this Tab are used in conjunction with the image box and its navigation elements in the main window. Both areas are synchronized.



The elements of the Tab have the following purpose:

Clip Length (in seconds): The Clip length is computed based on the Clip length in frames using the frame rate which is picked from the video source stream.

Clip Length (in Frames): This length shows the number of frames from the start frame to the end frame of the Clip.

Clip start/end frame number: In these edit boxes numeric values can be entered which specify the start and end frame in the source video stream to define the Clip.

Set current frame number to start/end of Clip: When these buttons are pressed the current frame number from the source video stream which is displayed in the image box of the main window is used to specify the start/end of the clip.

Show first/last frame of Clip: When these buttons are pressed the first/last frame of the clip is shown in the image box of the main window.

Scroll 10 frames forward/backward: With these buttons you can do a fast scroll with 10 frames per step through the Clip. Scrolling is only possible up to the end/start of the Clip.

Scroll one frame forward/backward: With these buttons you can do a frame based fine scroll through the Clip. Scrolling is only possible up to the end/start of the Clip.

Coarse scroll: With this slider a coarse scroll through the Clip is possible. Further this slider is synchronized during fine and fast scroll. Thus it always shows the position of the current frame inside the clip.

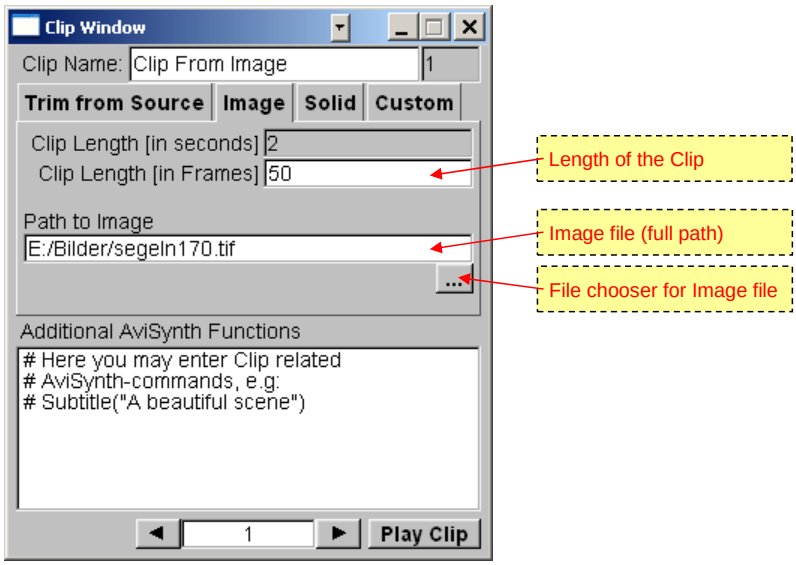
Frame number relative to start of Clip: This field shows the frame number of the current frame in the clip relative to the start of the clip.

Split Clip at current frame: With this button the current clip can be split into two succeeding clips. The first Clips ends at the frame before the current frame, the second Clip starts at the current frame.

5.3.2 Image Clip

With this Tab you can specify a Clip with a static image. The image is scaled to the size of the source video stream. Thus it is wise to crop and scale the image so that it fits to the video. Further the frame rate of the resulting Clip is also taken from the source video stream.

The image is displayed in the image box of the main window but the navigation elements are hidden.

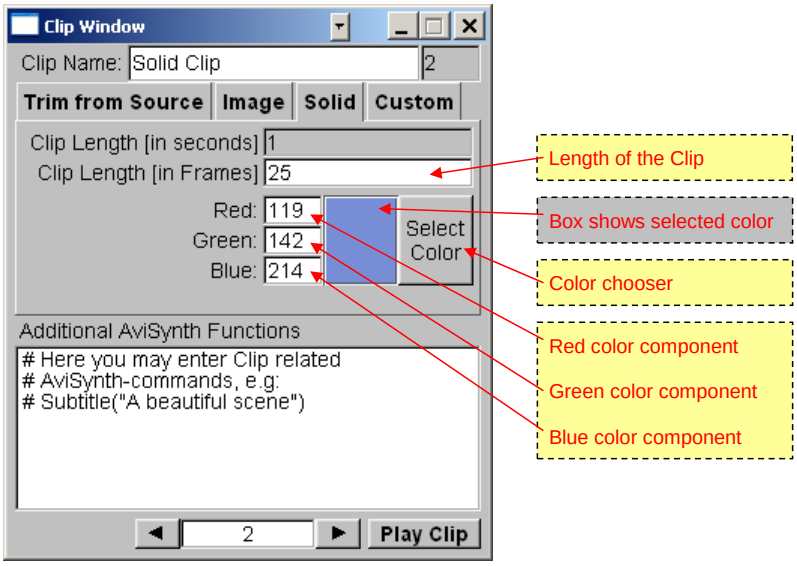


The Clip is specified by the **Length of the Clip**, which must be specified in number of frames, and the full pathname of the **Image file**. The image file may be selected via a **File chooser**. The format of the image file is determined by the ImageReader-function of AviSynth (see related documentation). This includes ".bmp"-, ".jpg"- and ".tif"-formats.

5.3.3 Solid Clip

With this Tab you can specify a Clip with a static color. The size and the frame rate of the resulting Clip are taken from the source video stream.

For solid Clips the image box of the main window will be hidden.



The Clip is specified by the **Length of the Clip**, which must be specified in number of frames, and the three **color components Red, Green and Blue**. The color may be selected via a **Color chooser**. A **box shows the selected color**.

5.3.4 Custom Clip

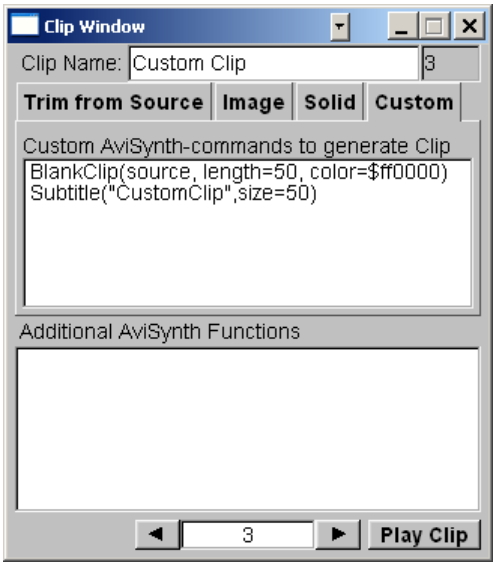
With this Tab you can specify a custom Clip. All AviSynth commands can be entered into the editing box to create the Clip. But be aware that you are responsible for the compatibility of custom clip with the source.

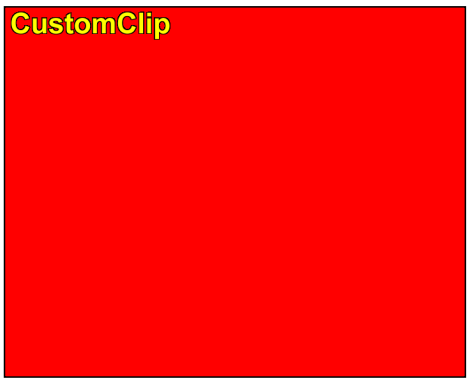
For custom Clips the image box of the main window will be hidden.

When specifying a custom clip some AviSynth variables can be used to access the source and some source information. These variables return the following information:

source:	Source video stream.
source_framerate:	Frame rate of the source.
source_width:	Width of the frames in the source.
source_height:	Height of the frames in the source.

The following example shows how to define a Clip of 50 frames with red solid color and a subtitle. The variable source is used to guarantee compatibility:





The left shows the definition of the custom Clip, the right shows a frame of the resulting Clip.

6 Creating a Film

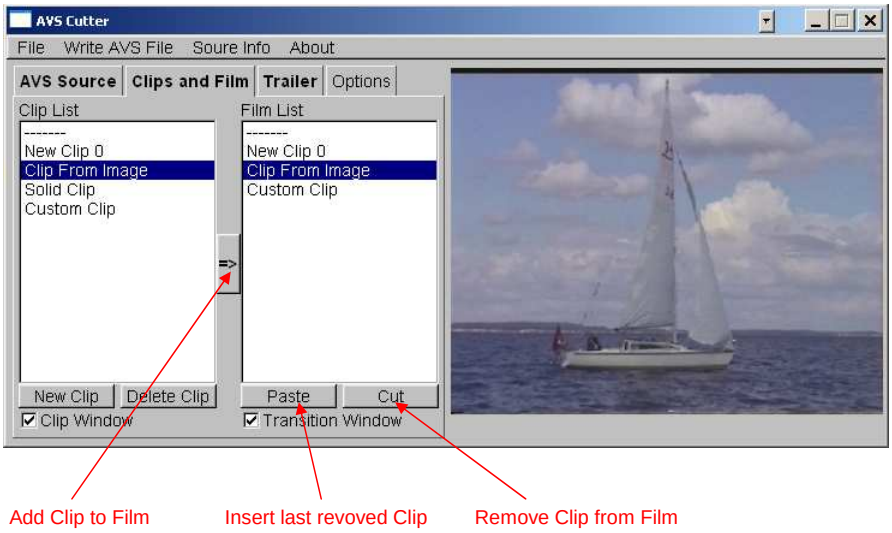
Film creation is done in two steps:

- First assemble the sequence of Clips that form the Film.
- Second edit the Transitions between successive Clips of the Film.

6.1 Assembling the Film

After defining the Clips they must be combined to form a Film. This assembly of Clips is also done in the main window with selected “Clips and Film”-Tab. The sequence of Clips that form the Film is held in the Film List at the right of the Tab.

To Add a Clip to the Film select the desired Clip in the Clip List and press the “=>”-Button between the Clip List and the Film List. A reference to the desired Clip will be added to the Film directly behind the selected Clip in the Film List. If no selection exists the Clip reference will be added at the end of the Film.

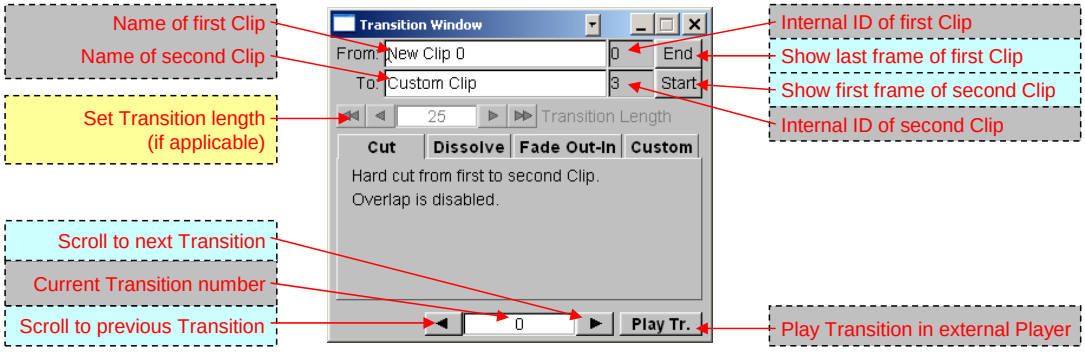


The above figure shows the main window with the button for adding Clips. Two more buttons allow manipulating the Film. A “Cut”-Button removes a selected Clip from the Film. The Reference to the Clip is stored in a paste buffer. Thus with the “Paste”-Button it can be reinserted at another position in the Film.

6.2 Editing Transitions

When a Film is assembled each entry in the Film List refers to a Clip and is also linked to a Transition. This Transition describes how to change from the current Clip to the next Clip in the Film sequence.

To edit a Transition the first of the two Clips in the Film List must be selected. When the “Transition Window”-check-box is activated the Transition Window appears:



At the top and at the bottom of the Transition window common elements for all transition types exist. The Tabs in the middle of the window are used to specify the transition type.

As in the description of the Clip window the elements are marked in three colors related to their purpose: Information, Navigation and Modification.

6.3 Common Elements

At the top of the Transition window all information concerning the two clips is presented:

Name of first/second Clip: The name of the first/second clip is presented here. The name can only be changed in the Clip window, not here.

Internal ID of first/second Clip: These elements show the internal ID of the first/second Clip. In case of duplicate Clip names a Clip can clearly identified with this ID. The ID is set internal; it cannot be changed by the user.

Show last/first frame of first/second Clip: These elements allow displaying the last frame of the first Clip or the first fame in the second Clip in the image box of the main window. Further the selected Clip will be displayed in the Clip window.

Below you find a counter element that allows the user to **set the transition length**. Dependent on the Transition type this element may be deactivated.

At the bottom of the Transition Window another counter element is placed that allows sequentially **scrolling to the previous/next Transition**. It further shows the **current Transition number** that sequentially increments along the Film. The first Transition has number 0, the second number 1, and so on.

Finally a button at the right bottom of the window allows playing the current Transition with the defined external player. See the “Options”-Tab of the main window how to specify this player.

6.4 Transition types

In the middle of the Transition window Tabs are shown which are used to define the type of the Transition. Four Types are available:

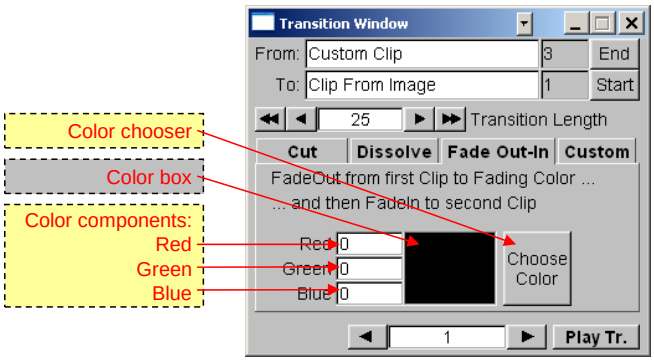
Cut: The last Frame of the first Clip is followed by the first frame of the second Clip. There is no overlap between the two Clips. Thus the scene changes hard from first to second Clip. No further parameters are required to define this type. The Transition length counter is deactivated.

Dissolve: The transition softly dissolves from the first to the second Clip. The Transition length counter is activated and defines the overlap between the two Clips. No further parameters are required to define this type.

Fade Out-In: The Transition dissolves from the first Clip to a frame with constant static color and then dissolves further to the second Clip.

The Transition length counter is activated. Half of its value defines the number of frames used for fading from the first Clip to the static color frame; the other half defines the frames for fading from the static color to the second Clip.

The color can either be specified by its **red**, **green** and **blue** component (each value must be in the range from 0 to 255) or can be selected using a **color chooser**. The color is shown in a **color box**.



Custom: AviSynth-commands must be used to define a custom Transition. This requires good AviSynth knowledge.

When coding the transition some AviSynth variables give access to the parameters:

left: A clip that holds the partial Film with the first Clip at its end.

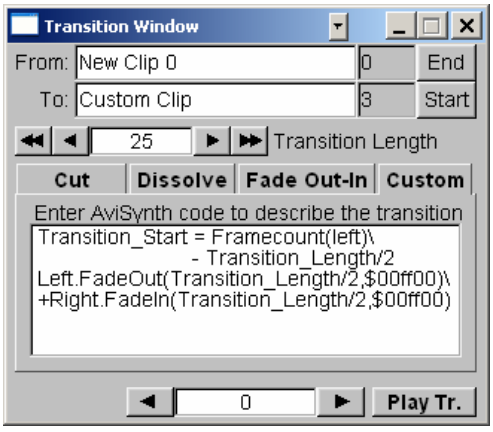
right: A clip that holds the second Clip.

Transition_Lenght: The selected transition length that is set in the related counter.

To ensure a correct transition preview with the “Play Tr.”-button an AviSynth-variable must be defined:

Transition_Start: This variable should hold the frame number where the Transition starts in the left Clip.

The following custom Transition has the same result as a “Fade in-Out” transition with green color selected:



7 Adding a trailer

The “Trailer”-Tab in the main window allows to specify a trailer that is added at the end of the Film.

Example: If you like to encode the edited AVS Film to MPEG it is often required to select a suitable color model. Typically YV12 is allowed. Then the following command in the edit box of the “Trailer”-Tab can be used to convert the complete Film:

```
ConvertToYV12(interlaced=true)
```

8 Options

In the “Options”-Tab two options can be entered:

AVS-Temp-File: Enter a full path name of a file that can be written. It is used to build temporary AVS-Scripts to generate the output for the image box and to call the external player.

AVS-Player: Enter the full path name of the external AVS-Player. On my computer I use VirtualDub which is located at:

```
C:\Programme\VirtualDub\VirtualDub.exe
```

9 Menu Commands

The Menu Commands allows creating, opening, saving and importing projects and to export a project into the final AviSynth description of the Film. Further it gives access to information about the source video and about the AvsCutter program itself.

In the sequel the menu commands are described in detail:

File → New Project: Creates a new, empty project. If an old project is open it will be terminated. It is wise to save the old project before creating a new one.

File → Open Project File: Opens an existing project file. Project files are saved with the extension “.cut”. If an old project is open it will be terminated. It is wise to save the old project before opening another one.

File → Save Project File: Saves the current project to a file. It is wise to choose a filename with extension “.cut”.

File → Import Project: Imports the source and the Clips of another project into the current project. The Film list of the other project will not be imported.

The source of the imported project is appended at the end of the existing source. The Clips of the imported source are added at the end of the Clip list. The frame numbers stored in the imported Clips are adjusted so that they point to same frames in the imported source as before which now reside at the end of the source stream and thus have different frame numbers.

File → Exit: This menu item let you exit the AVSCutter program.

Write AVS File: Creates an AviSynth-File that describes the Film.

Source Info: Gives information about frame rate, with and height of the source video stream.

About: Displays About-information

10 Special support for DV video files

AVI files captured from a digital camcorder are stored in DV (digital video) format. Besides the video information these files contain time stamps which allow automatic Clip creation based on the recorded scenes.

A campaigning program DV2AVSCutter reads AVI files in DV format and automatically creates an AVSCutter project file with each file scene set up as one Clip. See the related documentation.

The DV2AVSCutter program is also available at the Authors website.

11 License

The AVSCutter program is published under the GNU Public License that is found in the distribution.

12 Download

The program can be downloaded from the Authors site:

http://www.ecs.fh-osnabrueck.de/avscutter.html.