Roto++ ver. 1.6.0

Roto++ is an advanced tool for single curve Rotoscoping. Roto++ aims to assist the Roto-Artist by giving advice on curves.

Design Tools

- Selection Tool **(Q)**
- Rotate/Scale Curve **(R)**
- Add Points **(E)**
- Delete Points **(D)**
- Bezier Curve **(V)**
- Play Forward **(L)**
- Stop Playing **(K)**
- Play Backward **(J)**
- Change Curve Color
- Adjust Image Color
- Fill A Curve **(M)**
- Undo **(Ctrl+Z)**
- Zooming **(1,2)**
- To Previous Frame **(Z)**
- To Next Frame **(X)**
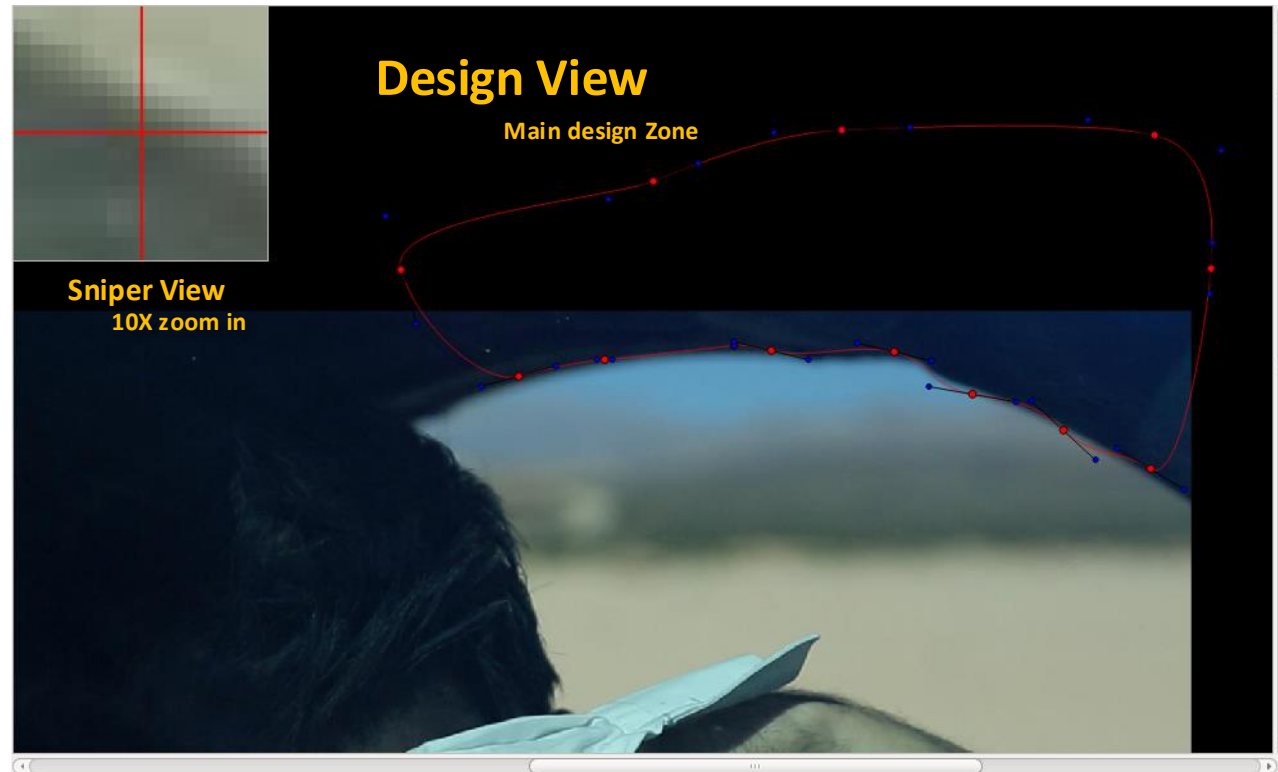- Clear Current Frame

Roto Tools

- **(H)** Set Keyframe
- **(U)** Remove Keyframe
- **(Ctrl+V)** Clone A Curve
- **(G)** Assisted Grab&Move
- **(W)** Active Contour
- System Mode One
- System Mode Two
- System Mode Three
- System Mode Four

Roto++

File   Edit   About

Design View

Main design Zone

Sniper View
10X zoom in

Timeline

8   9   10   11   12   13   14

Black
No Curve

Yellow
A curve manually drawn in this frame

Red
Suggested for user edit

Blue
A curve generated by the system

Green
Keyframe i.e. the curve is confirmed

1

Design View

Design View

The design view is the main design zone of Roto++. You will note there are two different sections in design view i.e. the frame area and black holding area. The frame area is an active document area where an image is rendered as background. The background can be move by *right-clicking* and dragging. The black holding area is the working area that is not filled by the image. The points and lines can be drawn in both areas.

Sniper View

The sniper view shows a 10X closeup of the area around the cursor. The magnification can be adjusted using mouse wheel on the sniper view.

2

Timeline

Frame index

Current Frame
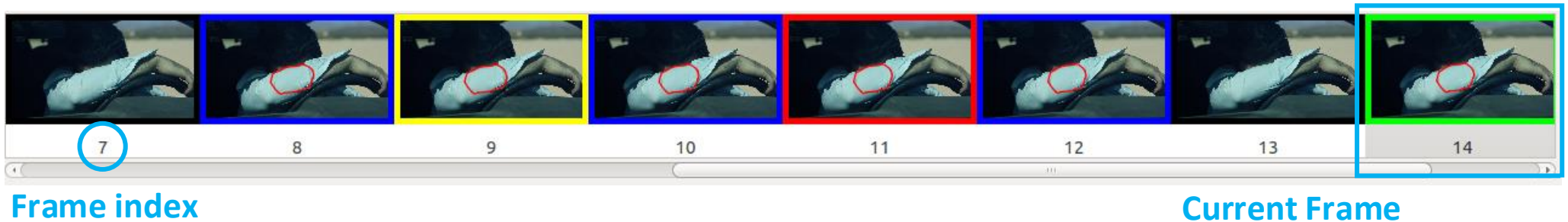
Timeline

The Timeline gives a thumbnail-sized view of the sequence. Scroll or jump to any frame in the shot by *left-clicking* or using *arrow keys*. Each thumbnail has a color-coded border, with the following meanings.

Color Coding

Color-coding on a thumbnail's border shows the roto-status of that image:

Black: No curve has been drawn in this frame.

Yellow: User has made unsaved changes to this frame.

Blue: A curve was automatically generated for this frame.

Green: Keyframe, i.e. the user has confirmed the latest curve of this frame.

Red: The system recommends this frame for attention from the user.

Note that once a frame is set as keyframe (see Roto Tools), the system automatically generates curves for all other non-keyframes. This process will **OVERWRITE** any curves in non-keyframes i.e. the frames with colors *Black*, *Yellow*, *Blue* and *Red*.

3

Design Tools

This section along the left-hand side of the screen provides a range of tools for curve editing and control of the display.

(Q) Selection Tool

(R) Rotate/Scale Curve

(E) Add Points

(D) Delete Points

(V) Bezier Curve

(L) Play Forward

(K) Stop Playing

(J) Play Backward

Change Curve Color

Adjust Image Color

(M) Fill A Curve

(Ctrl+Z) Undo

(1,2) Zooming

(Z) To Previous Frame

(X) To Next Frame

Clear Current Frame

1. Select multiple points by drawing a square using left button of the mouse.

2. Move an existing point or a tangent point by clicking on them.

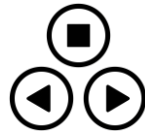**3.** Grab and move an entire curve or the selected points.

Create another point in a chain with a single left-click. Or click-and-drag to adjust the related tangent point.
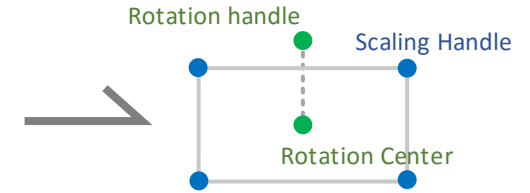
Deleted a point and re-connects the curve.

Draw a Bezier curve. Click-drag to insert and adjust the tangent too.

Play controls: Stop, Play Forward and Backword

Change the color of a curve.

Rotation handle

Scaling Handle

Rotation Center

Rotate a curve: *First* place the rotation center (pivot), *then* turn the rotation handle.
Scale a curve: Drag any of the scaling handle.

Adjust shot brightness, contrast, and gamma.

Display current curve as filled, using the current color.

Undo last edit

Toggle zoom mode, controlled by mouse wheel or shortcuts '-' and '+'.

Step to previous frame in the shot

Step to next frame in the shot

Discards all the points and lines in the current frame.

4

Roto Tools

This section along the right-hand side of the screen provides a range of tools for setting keyframes, cloning curves, and for some under-the-hood experiment-related features.
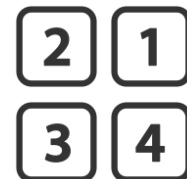
(H) Set Keyframe

(U) Remove Keyframe

(Ctrl+V) Clone A Curve

(G) Assisted Grab&Move

(W) Active Contour

System Mode One

System Mode Two

System Mode Three

System Mode Four

Label in Flow List
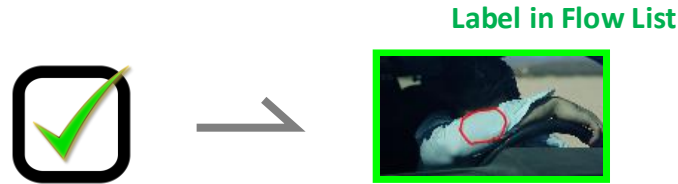
Set-keyframe: this button is an essential part of roto++. Press this to save all the roto-curve work you've done on the current frame. The system will use the roto curves from all saved keyframes to generate suggested curves in the remaining frames. (Suggested curves **OVERWRITE** all curves in non-keyframes that you didn't commit as keyframes.)

This tool will remove the keyframe label from the current frame. The system will then generate a new curve for the current frame using the rest of the keyframes.

These toggles indicate different types of system assistance. The choice here only alters the algorithm behind the Roto++ instead of the user operations.

This tool simply clones the curve from the closest keyframe to the current frame. It is normally used when the system-suggested curve is not satisfying, and starting with a duplicate of a keyframe would be easier. Pulling in a clone **OVERWRITE** the curve in the current frame.
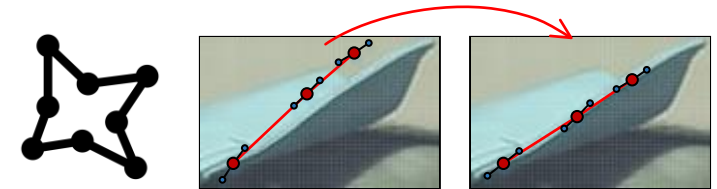
This tool performs active contour technique onto the curve of the current frame. The active contour is a famous computer vision technique that forces all the points aligning to the closest edges of the image. This tool updates the points only if those points are very closed (less than 5 pixels) to a proper edge.

This tool gives instant roto advices when the user **selects** points and drag them.
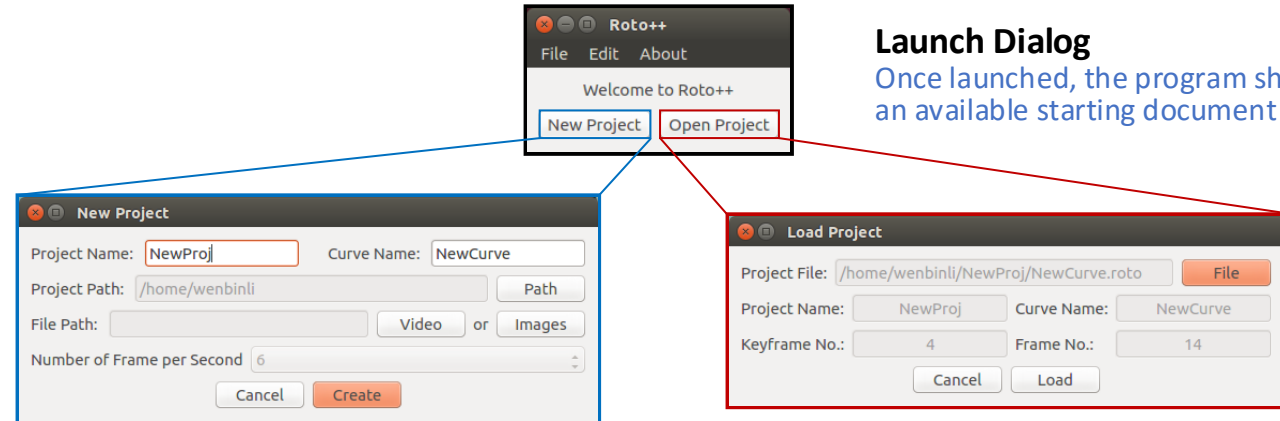
5

Menus and Dialogs

This menus along the top of the screen provide a range of functions for creating, saving, loading and exporting a project.

File Menu

New Project	Ctrl+N
Open	Ctrl+O
Save	Ctrl+S
Save As	Ctrl+Shift+S
Import Points	Ctrl+I
Export Points	Ctrl+E
Close App	Ctrl+W

Edit Menu

|	
↺ Undo (Ctrl+Z)	Ctrl+Z
⬅ To Previous Frame (1)	1
➡ To Next Frame (2)	2

Launch Dialog
Once launched, the program should show an available starting document like this.

New Project Dialog
This dialog create a Roto++ project by giving project name, curve name and the path to video file or images. If taking a video as input, a sample rate is also required.
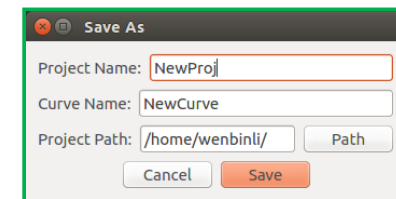
Load Project Dialog
This dialog loads a Roto++ project by giving the path to the project file. The dialog also shows the basic information of the project file e.g. project name, curve name, number of keyframes and number of frames in total.
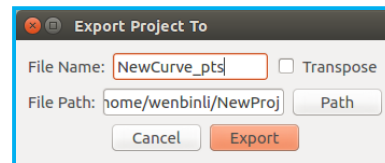
Export Project Dialog
This dialog exports a Roto++ project into a matrix format file.

Save As Dialog
This dialog save a Roto++ project to the given file path.

6