Imaging Whiteboard 2.0
Cookbook

Contents

Sound Analysis

Introduction

This cookbook is a supplement to the Imagining Whiteboard 2.0 User's Manual. The user's manual contains simple whiteboards to show the functionality of individual controls as they are described. This cookbook will explore more complex algorithms, and discus the design choices made. XML whiteboards will be available on the Sound-Analysis web site so that you can restore these in your own copy the Imaging Whiteboard.
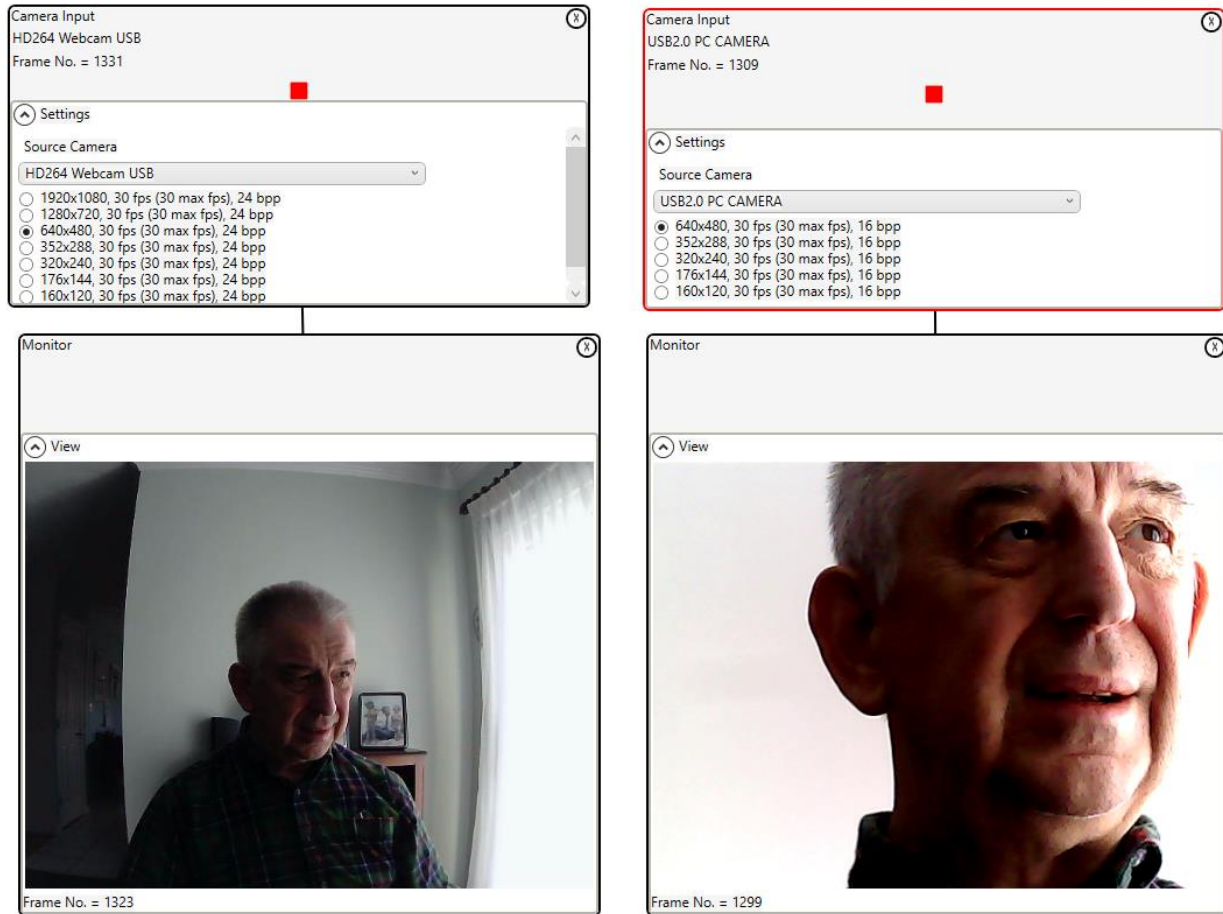
2 Cameras

Figure 1 : 2 Simultaneous cameras

This first whiteboard simply demonstrates that multiple simultaneous pipelines can run in a single whiteboard. If restoring this whiteboard from XML be sure to select your own cameras and resolutions before starting the cameras. Note also that two pipelines cannot be simultaneously driven by the same camera; if this is desired use a single instance of the camera input control to drive both algorithms.
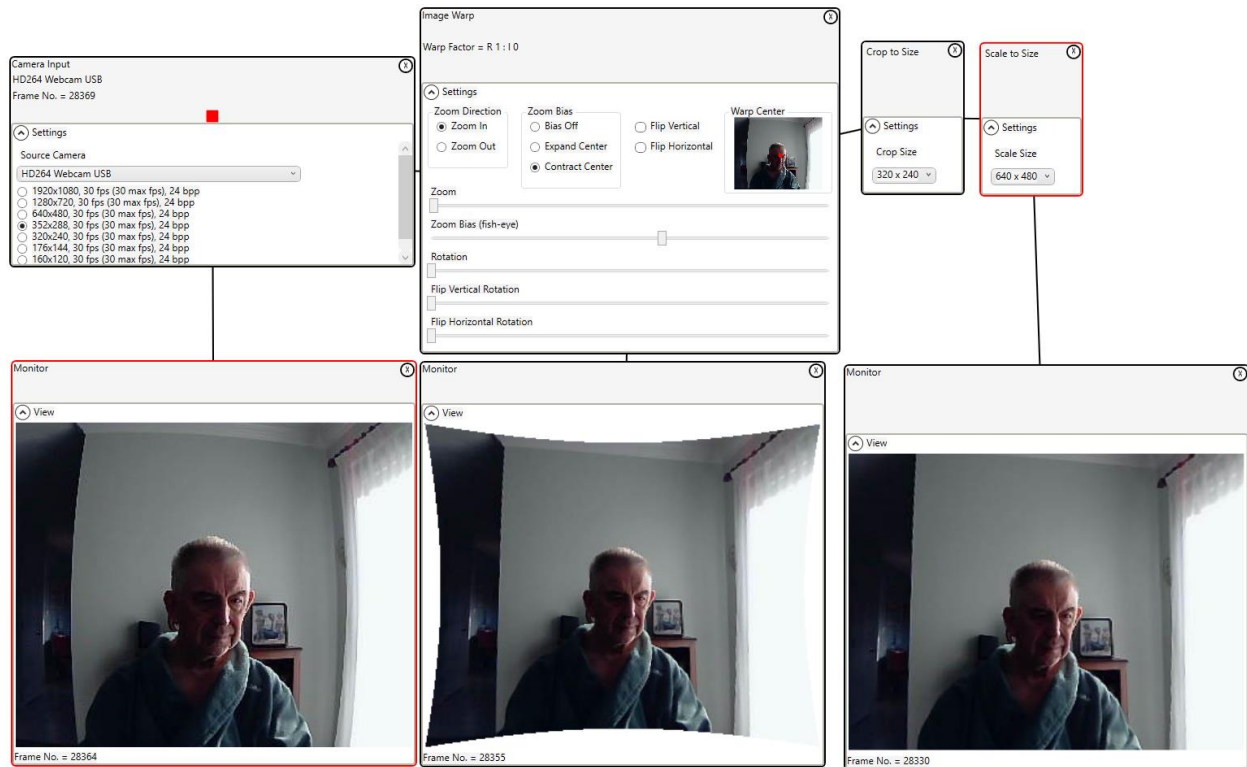
Fisheye correction

Figure 2 : Fisheye correction

This was mentioned briefly in the user's manual to describe the warp control. Here we also use the resizing controls to remove the pin cushioning effect. First the warped image is cropped to remove the extended corners, then the image is resized to restore close to the original size.
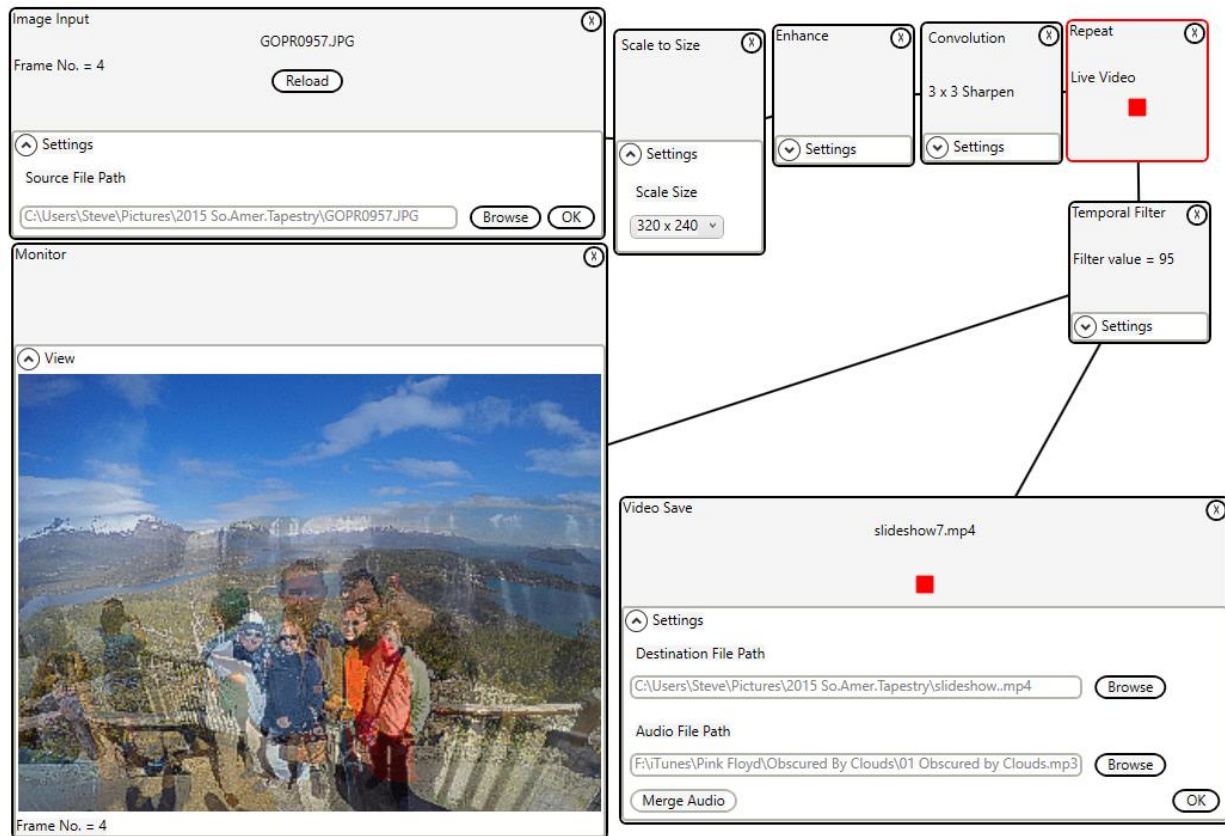
Slideshow

Figure 3 : Slideshow creation

This technique can be used to create a video slideshow from a collection of images. The image input is used to select images in turn. You should organize the required images beforehand. There is an unwritten rule that all frames in a video should be the same size, image files do not follow this rule especially if the photographs come from different devices. To avoid problems with frame size mis matches the scale to size control should be used; this has the additional benefit that reduced image size will substantially speed processing. The image enhancement and sharpening are optional. Repeat is required as every image needs to be written to the video file several times; again, a low resolution will speed up the repeat rate significantly. The temporal filter is used with a high value to fade from one image to the next, as captured in the screen shot. Once the slides have all been captured and the video stopped an audio file may be merged with the video; to provide background music for example.
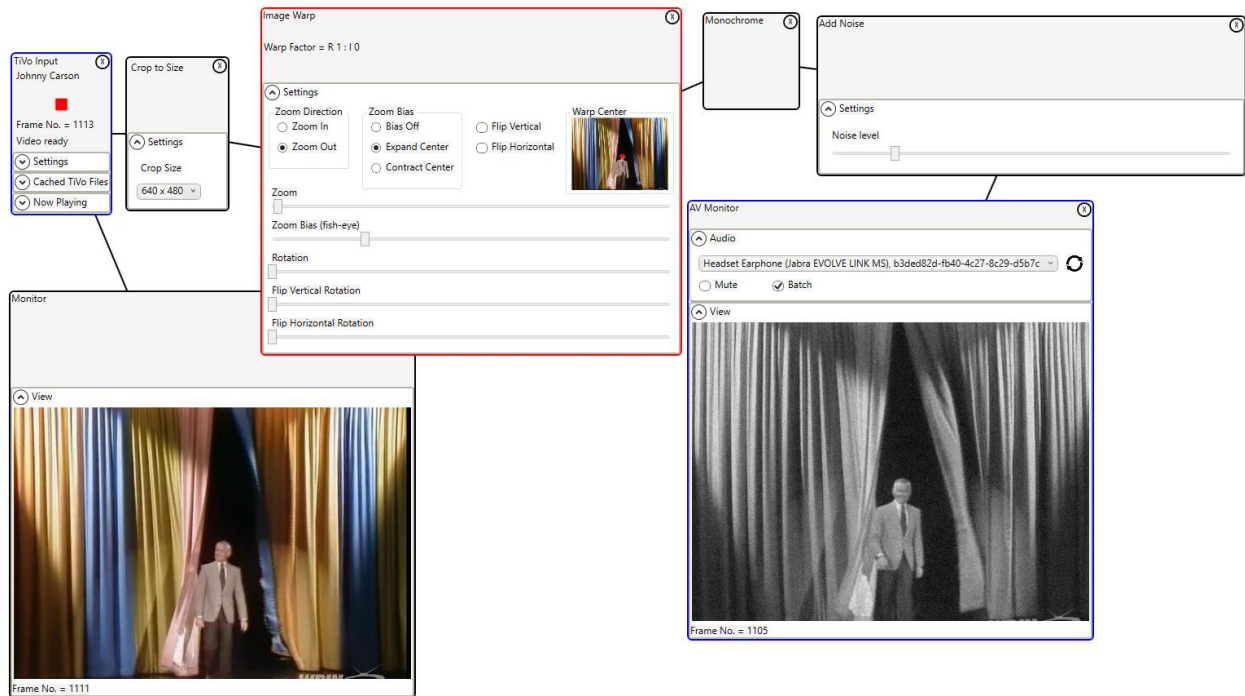
Black and White TV simulation

Figure 4 : Black & White TV

If you miss the old black and white TV experience this can easily be recreated. Here we use an old Johnny Carson show recorded on TiVo. This show was recently broadcast.

Here we crop the original to 640 x 480 to produce the correct resolution and aspect ratio. The warper is used to create the round TV tube look that preceded flat screens. Of course, monochrome is vital, and finally to complete the experience noise is added.
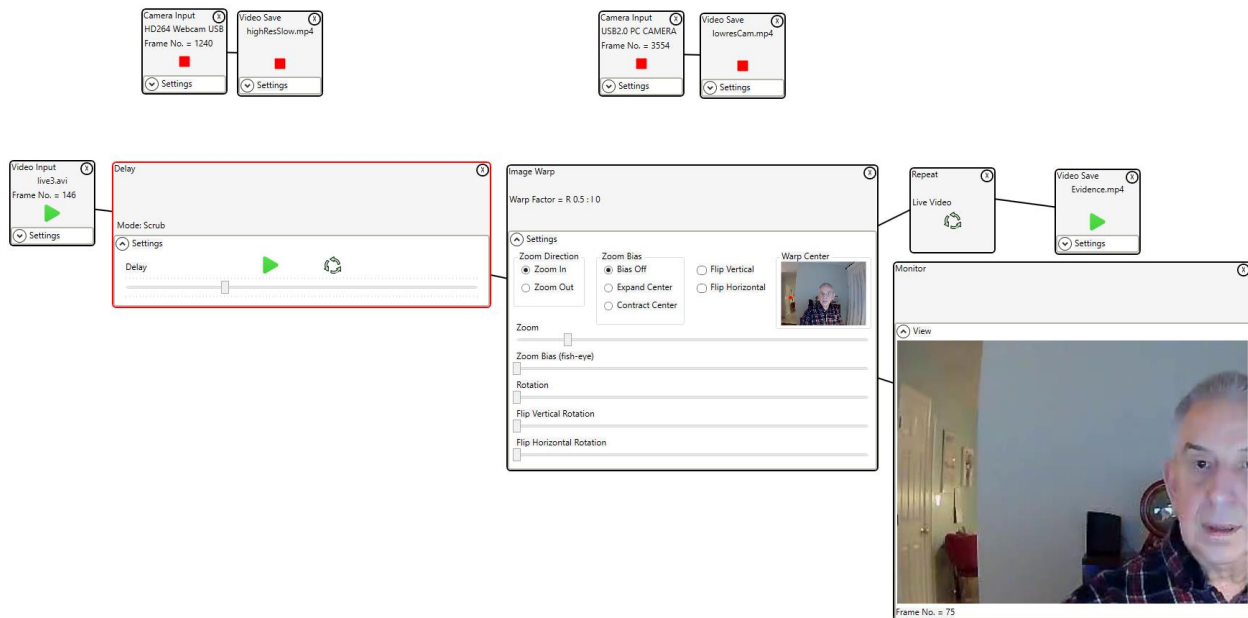
Security DVR

Figure 5 : Security DVR

Here we have feeds from two cameras being simultaneously recorded at the top of the whiteboard. While at the bottom we are searching a previously recorded video for evidence.

The Video Input control is used to play and pause the video while the delay control is in acquire mode. Once suspicious activity is detected the video is paused and the delay control switched to scrub mode. The previously acquired frames are searched for the suspicious event. Once this is found the repeat control can repeat the frame while it is recorded. Then for context the delay control can be set to loop mode while this is also recorded. The warp control is used to zoom in on the area of interest.

There are many other controls that could be applied to enhance and analyze the recorded video. The whiteboard metaphor makes it easy to try different algorithms and adjust them on the fly.