

RTMaps Magnifying Glass Point Tracking...

Summary:

You will connect algorithms to a video flow. You should use a webcam to test the Real Time Acquisition. If you don't have one, use *30' webcam* database (available for download on the Intempora tutorials webpage).

RTMaps Software

RTMaps is a Real Time data acquisition and processing Software. Many components and functionalities allow to easily develop any type of Real Time Multisensor Application (Robotics, Automatism, Automotive, Ergonomics, Sports...).



Duration: 15 minutes

Objectives:

- » Manipulate RTMaps Studio
- » Use the OpenCV library components
- » Register Data
- » Create an AVI movie file.

Keywords:

- » RTMaps Studio
- » Algorithms
- » Image Processing
- » Point Tracking

Prerequisite:

Before starting this Tutorial, you should have done the tutorials RTMaps Magical Tour and RTMaps Pop'Art.

Used components:

Webcam, Viewers, Colorspace Converter, Player, Objects Viewer, Overlay Drawing, Points Tracking, Magnifying Glass, Recorder, Snapshot...

The Magnifying Glass Component

The Video Source

Launch RTMaps Studio and place a video source on your diagram. Like in the previous tutorial, you can use a webcam as well as an RTMaps database including an image flow (with a player component).

To use a *webcam* component, register the *rtmaps_webcam.pck* package. Place on your diagram a *webcam* component, edit its properties and choose an RGB Video Format (you'll find more explanations about the video format in [Red Blobs Detection Tutorial](#)).

To use a database, place a Player component on your diagram, edit its properties and browse for an RTMaps database. For example: *C:\Program Files\Intempora\RTMaps 3.2\samples\databases\tutorial_video*. Use an *Image Viewer* to check your video source.



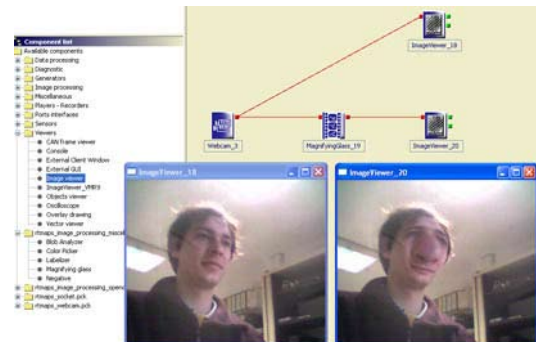
Save your diagram.

The Magnifying Glass

The Magnifying Glass Component

This component performs a magnifying glass effect in an area of the video.

Register the *rtmaps_image_processing_miscellaneous.pck* package. In the *image_processing_miscellaneous* section from the component list window, you'll find the *Magnifying Glass component*. Place it on your diagram. Also place an *Image Viewer*. Connect your *webcam* component to the *Magnifying Glass* and then to a new *ImageViewer*. You can observe that the center of the image is distorted.



Controlling the Effect Position

The *image Viewer* provides two outputs: *MouseClicked* and *ROI*. *MouseClicked* outputs the coordinates of the Mouse when you click in the display window created by the *Image Viewer* component.

Edit the properties of the *magnifying glass* and parametrize it by choosing *coordinates* (in *Pixels*) in the *UseSettingInput* property. A second input called *PixelCoords* is created. Connect the *mouseClick* output of the viewer to this new input.

Diagram and readability:
When the diagram becomes complex, don't forget to affect colors and breaks to your connexions in order to have a more understandable diagram (Right Click on the wire).

Run the diagram. Now, when you click on the Image, the video effect is centered at the position of the Mouse Click!

Shutdown the diagram.



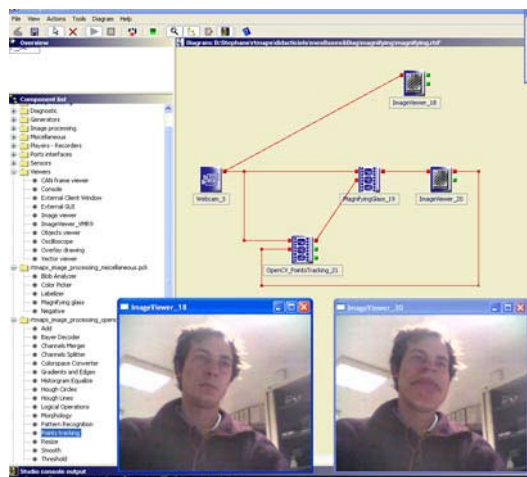
Following the point

Point Tracking

This component will follow the point you will indicate as long as it stays in the image.

Register the `rtmaps_image_processing_opencv.pck` package and place a *Point Tracking* in the diagram. Connect the *webcam* output to the *ImageIn* input of the *point tracking* component.

Disconnect the connexion between the *ImageViewer* output and the second Input of the *Magnifying Glass* (use the right click>Disconnect). Then, connect the *Mouse Click* output of the *image Viewer* to *points to track* input of the *Point Tracking* component. Finally, connect the first output of the *Point Tracking* (*TrackedPointsCoords*) to the second Input of the *Magnifying Glass* (*PixelCoords*).



Points and Object Viewers

Display the tracked points

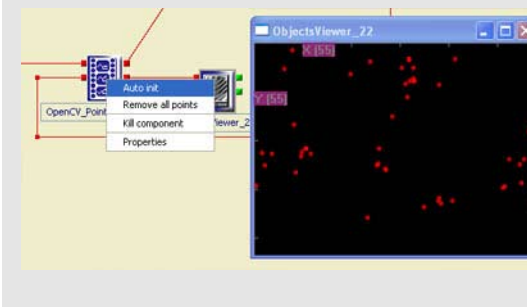
In the *viewers* section of the component list, choose an *Objects Viewer* and place it on the diagram (on the right of the *Point Tracking* component). Connect the 2nd output of the *Point Tracking* (*trackedPointObject*) to the *ObjectViewer*. By default the size of the *object viewer* is 256*256. You can parametrize it in its properties to obtain the same size as the images from your webcam (ex: 320x240).

Run the application and click somewhere in *the viewer*; a red point appears. If the object is moving, the point moves with it.

Shutdown the diagram.

The *autoInitFunction*:

Instead of tracking one point, the *AutoInit* Function finds the N points easier to track in the image. This function is accessible with a right click on the component.



Overlay Drawing

You can also overlay the point into the image. Use an *overlay drawing* component, available in the *Viewers* section of the component list. Install this component between the *magnifying Glass* and the corresponding *image viewer*. Disconnect the wire and reconnect it with the *overlay drawing* in-between.

Connect the *TrackedPointObjects* output of the *point tracking* to the *drawing objects* input of the *overlay drawing*. Connect the *overlay drawing* to the *viewer*.

Run the application.

Shutdown the diagram.



Recording database and/or Avi files

^{RT}Maps Database

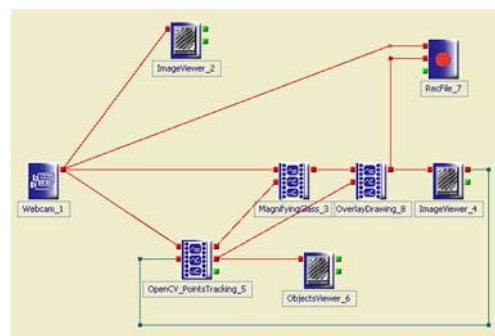
Place a *recorder* component (available in the *Players - Recorders* list) on the diagram. Connect the *webcam* output to the *recorder* input. Click OK in the small dialog box (leave the default options as they are).

A new input is automatically created. Connect, for example, the data from the *OverlayDrawing* output. You can connect any data you want to the *Recorder*.

In its properties, choose the folder where you want the database files to be created.

Now, each time you will run the application, the data will be recorded.

Run the application for some time. Then shutdown the diagram.



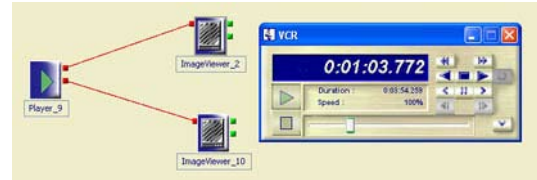
Replaying your own Data

Remove the *Recorder* component from the diagram with a right Click on it (Kill component).

Remove the *webcam* component and place a *Player* component instead. In the *player* properties, browse for the *.rec* file in the folder you have just chosen before. You will find as much outputs as data tracks you have recorded. If you have followed this tutorial, the *Player* then provides 2 videos flows, one corresponding to the webcam

raw images and one with the tracked points and the magnifying glass effect.

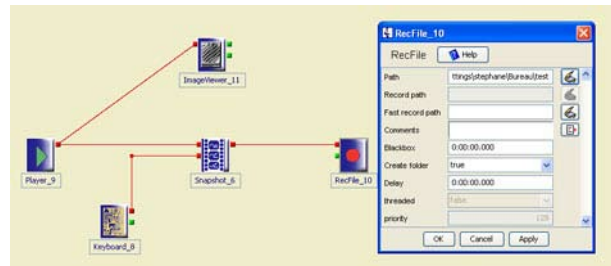
Connect two viewers to confirm that. You can also continue by connecting any component you want.



Snapshot

Conserv an Image result in a jpg file.

In the *Image processing* section of the component list, choose a *Snapshot*, place it on the diagram. and connect its input to the *Player* (or to a webcam component). Connect its output to a *Recorder* and choose *jpeg* as a recording method. In the *Recorder* properties, browse for the folder where you want to record your snapshot. In the *Sensors* section, choose a *Keyboard* component. Connect its output to the *trigger snapshot* input of the *Snapshot* component. Each time you will press any key, a jpg file will be recorded in the folder you've chosen.



Note that you can not use all the VCR functionalities when using a diagram containing also a *Player* and a *Recorder*.

Contact us or leave a question in the forum.

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