

# A generic webcam image acquisition plugin for ImageJ

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## Abstract

The IJ\_webcam\_plugin allows image acquisition using a broad range of easily available webcams, on all ImageJ supported platforms. This software note describes current functionalities using the plugin from ImageJ graphical user interface, or from the macro language.

## Introduction

A variety of image acquisition plugins are available for ImageJ<sup>1,2</sup>. Most are specific to given models of cameras, some aim at being more generic, addressing a range of devices, like the Twain plugin, or the QuickTime Capture plugin. Unfortunately, they are usually specific to a given host system. This prevents their usage in a multi-platform environment. Here we describe a new acquisition plugin that allows to capture images or videos as series of images in a platform-independent manner, and using any webcam compliant device.

## Technical details

The IJ\_webcam plugin is based on the Java Webcam Capture library by Bartosz Firyn<sup>3</sup>. This library allows to use a variety of webcam-like devices recognized by multiple capturing frameworks from Java. Available frameworks include OpenIMAJ, GStreamer, JMF or V4L4j. It's been designed to abstract common camera features and cameras themselves. Device abstraction hides the details of talking to a specific class of device and allows to write short and reusable code.

In a nutshell, webcam objects are easily discovered and created:

```
Webcam webcam = Webcam.getDefault();
```

will discover the default webcam.

Images can then be retrieved as BufferedImage objects easily:

```
Webcam.open();  
  
BufferedImage image = webcam.getImage();
```

Of course ImageJ can create its own flavour of image object from BufferedImage.

```
ImagePlus imp = new ImagePlus("Title");  
  
imp.setImage(image);
```

This provides with sufficient methods to grab images from webcams, and convert them into ImageJ images.

## Installation

Installation requires 3 steps:

1. Download the webcam capture libraries contained in webcam-capture-0.3.10-dist.zip  
Unzip and place to following files in your ImageJ/plugins/jars/ folder, so that you end up with the following files:  
ImageJ/plugins/jars/ webcam-capture-0.3.10.jar  
ImageJ/plugins/jars/ bridj-0.6.2.jar  
ImageJ/plugins/jars/ slf4j-api-1.7.2.jar
2. Download the IJ\_webcam\_plugin.jar plugin  
Place it in your ImageJ/plugins/ folder, so that you end up with the following files:  
ImageJ/plugins/IJ\_webcam\_plugin.jar
3. Restart ImageJ.

## Usage

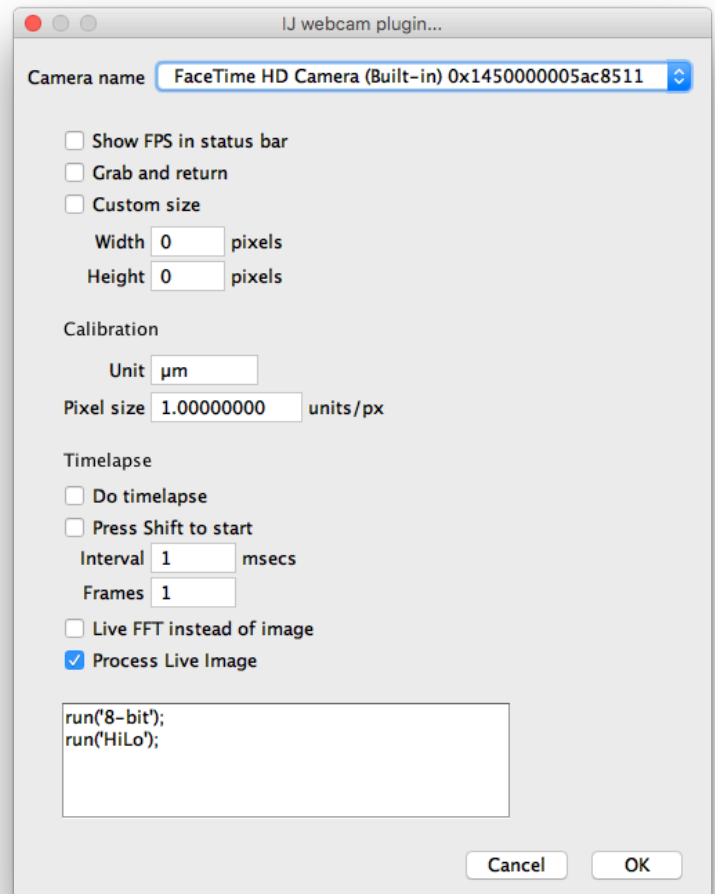
Start the plugin by launching the plugins>IJ webcam plugin menu command.

Acquisition by be performed using different modes:

- Grab an image and return
- Start Live mode
- Record a video as series of frames with given interval
- Display a live FFT transform of the live image feed
- Process each frame of the live image with a macro

## Options dialog

- **Show FPS** in status bar : displays the current video rate in frames per second.
- **Grab and return** : when clicking OK, the camera will return a single still image.
- **Custom Size** : the returned image will have these dimensions. If the given resolution is not a supported resolution, the aspect ratio of the scene might be weird.
- **Calibration**: this unit and pixel size will be set for the output image.
- **Timelapse**: 'Do time-lapse' to setup the plugin for acquiring a predefined number of frames separated by 'interval' msecs.
- **Live FFT**: check this to display the image power spectrum instead of the image
- **Process Live Image**: Every acquired image will undergo the macro in the text area below before being displayed.



## Usage in macros

Use the command recorder to record proper syntax. For example:

```
run("IJ webcam plugin", "grab");
```

will grab one image from the default webcam, using its default resolution and return.

## References

1. Rasband, W.S., ImageJ, U. S. National Institutes of Health, Bethesda, Maryland, USA, <http://imagej.nih.gov/ij/>, 1997-2016.
2. List of available image acquisition plugins : <https://rsbweb.nih.gov/ij/plugins/index.html#acq> , retrieved 2016-05-24.
3. Webcam Capture documentation: <http://webcam-capture.sarxos.pl>