**Documentation for NewCameraControl**

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Overview:

This code is written to bring the functionality of the Python wrapper pycromanager to a running version of Micro-Manager. The camera control class has three functions. The initialize function creates a core for the connection to the camera then loads the device using the serial connection port defined. A few properties are also set at this time, these were defaults on the pycromanager site. The second function is how images are taken and saved. It has inputs of exposure time (in milliseconds), folder path to save to, the filename given, a numerical suffix, an amount of contrast to enhance a copy of the image, and the EMGain. The EM gain only makes any changes if it is set to a value over 3 so if the connected device is not an EM CCD, leaving the value at 3 allows the code to ignore that input.

The take image code sets the EM Gain, sets the exposure time and then takes the image. After this, the rest of the code deals with the image that was just taken. It saves the pixel values in as the array to create a tif and then writes the pixel values to a tif using tifffile. Next, that saved image is opened and the contrast is enhanced and the image is rotated. The code saves the altered tif as well as converts it to a JPG. The enhanced JPG is used to be put onto the GUIs in each of the GUI codes.

The final function simply deletes the core, removing the connection to the camera.

Notes:

The method to change the tif to a JPG requires changing the image mode in a couple of ways that were determined through parsing through online forums for others with these types of issues. It is not clear as to what exactly the conversion methods do but it works to save the JPG and the original tif is not altered, so the data for post-processing is conserved.

Acknowledgements:

Micro-Manager 2.0 was downloaded and used to control all of our cameras:

Arthur D Edelstein, Mark A Tsuchida, Nenad Amodaj, Henry Pinkard, Ronald D Vale, and Nico Stuurman (2014), Advanced methods of microscope control using μManager software. **Journal of Biological Methods** 2014 1(2):e11 [<doi:10.14440/jbm.2014.36>](http://dx.doi.org/10.14440/jbm.2014.36)

Pycro-manager is the Python wrapper to communicate with Micro-Manager:

https://github.com/micro-manager/pycro-manager