

BatchCrop User Guide

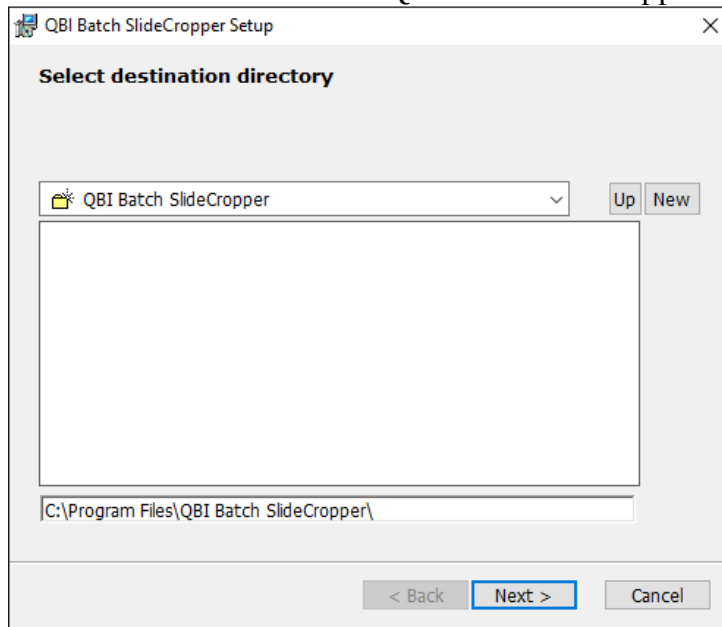
QBI Microscopy Facility

Queensland Brain Institute, The University
of Queensland Research Lane, St Lucia,
4072 QLD, AUSTRALIA
qbi.microscopy@uq.edu.au

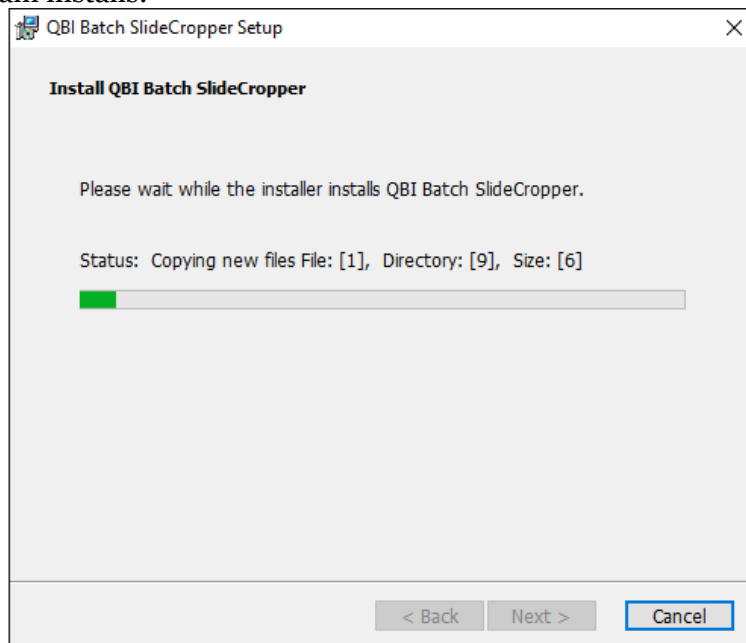
- To start, check the requirements at the end of this document.
- Download the latest Windows .msi installer from GitHub here:

<https://github.com/QBI-Microscopy/BatchCrop/releases/>

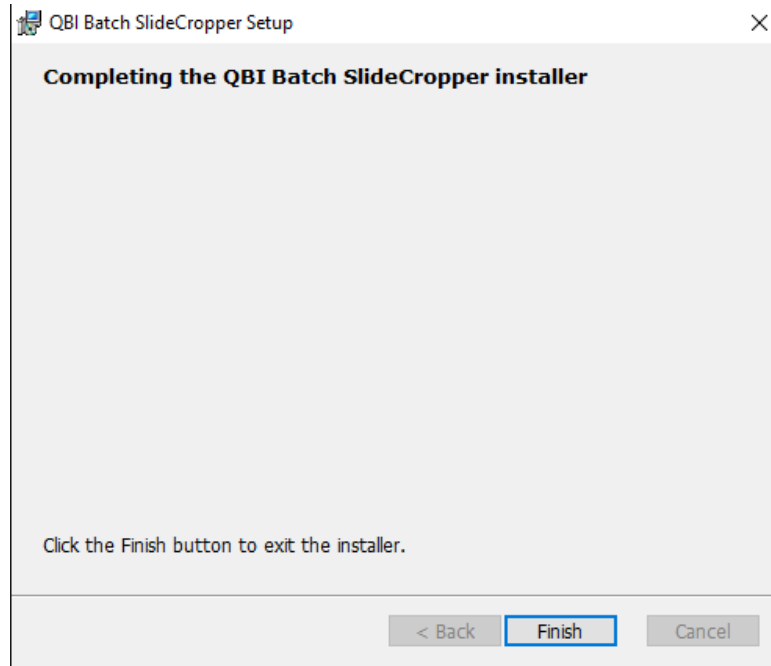
- Select default location for installation of QBI Batch SlideCropper:



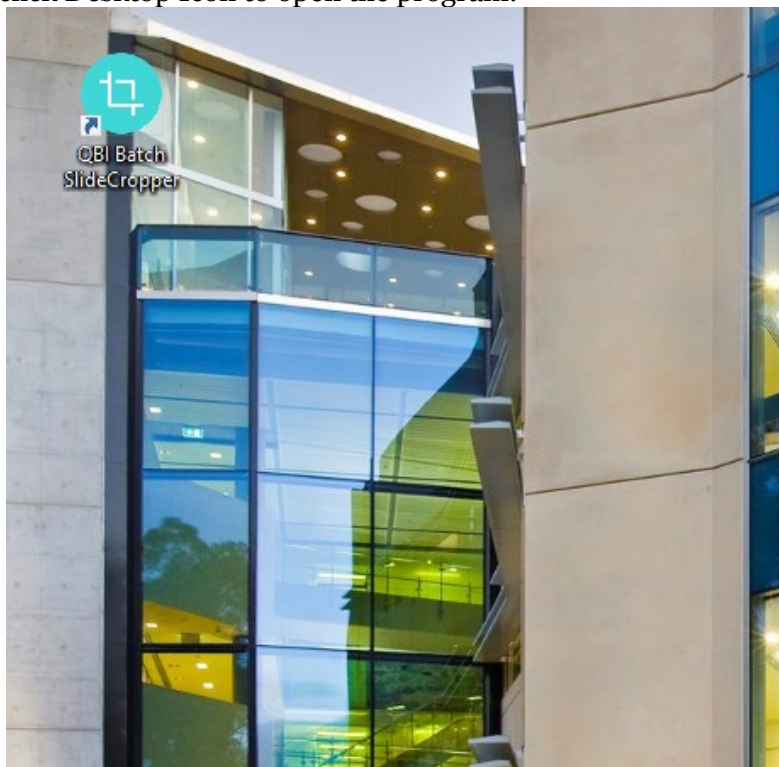
- Click “Yes” to allow the program to make modifications if prompted, then wait while the program installs:



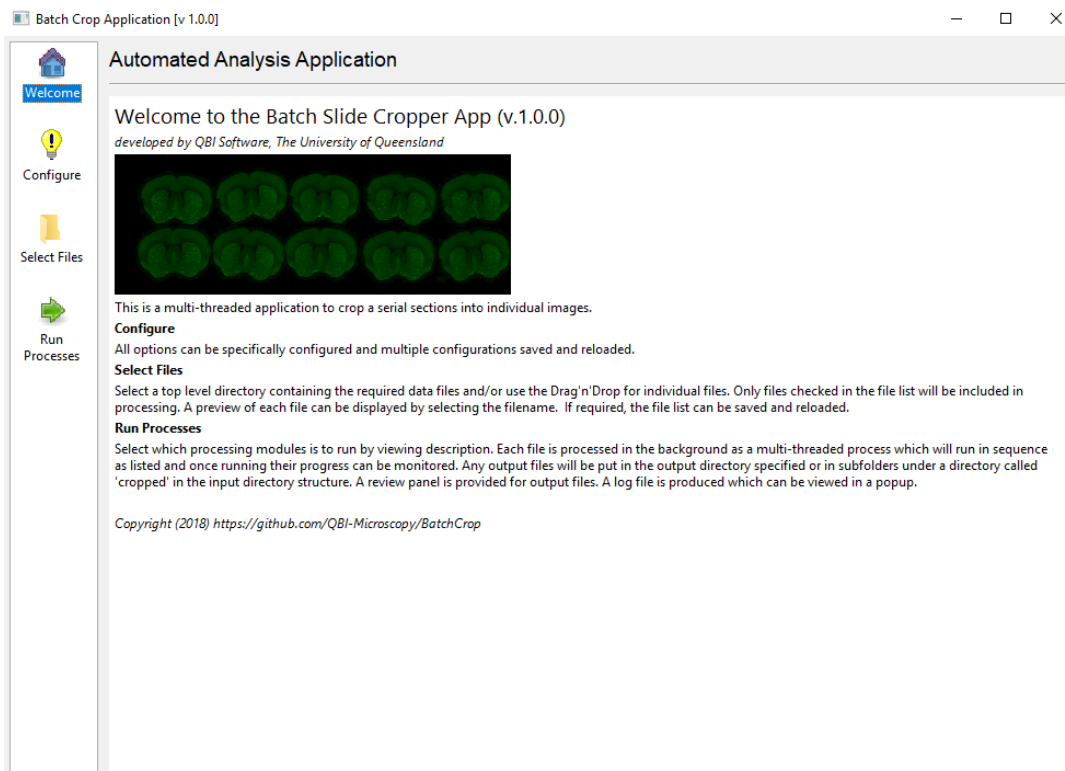
- Click “Finish” to finish installation:



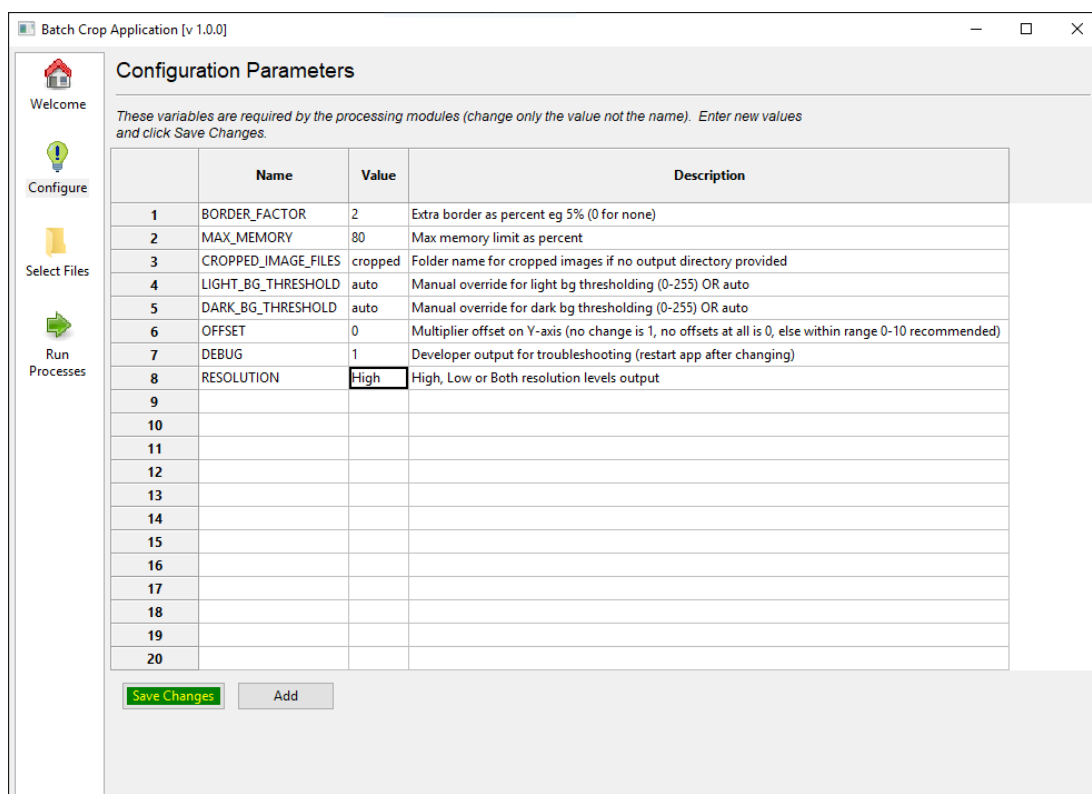
- Double-click Desktop Icon to open the program:



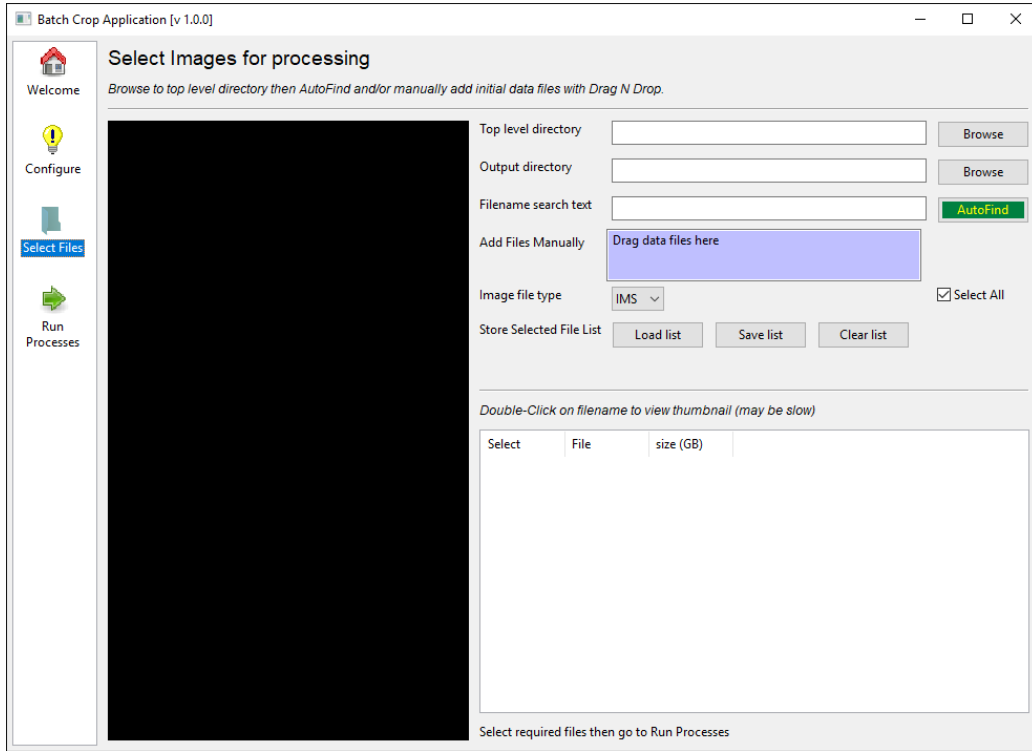
You can navigate the programme via the 4 tabs on the left column.



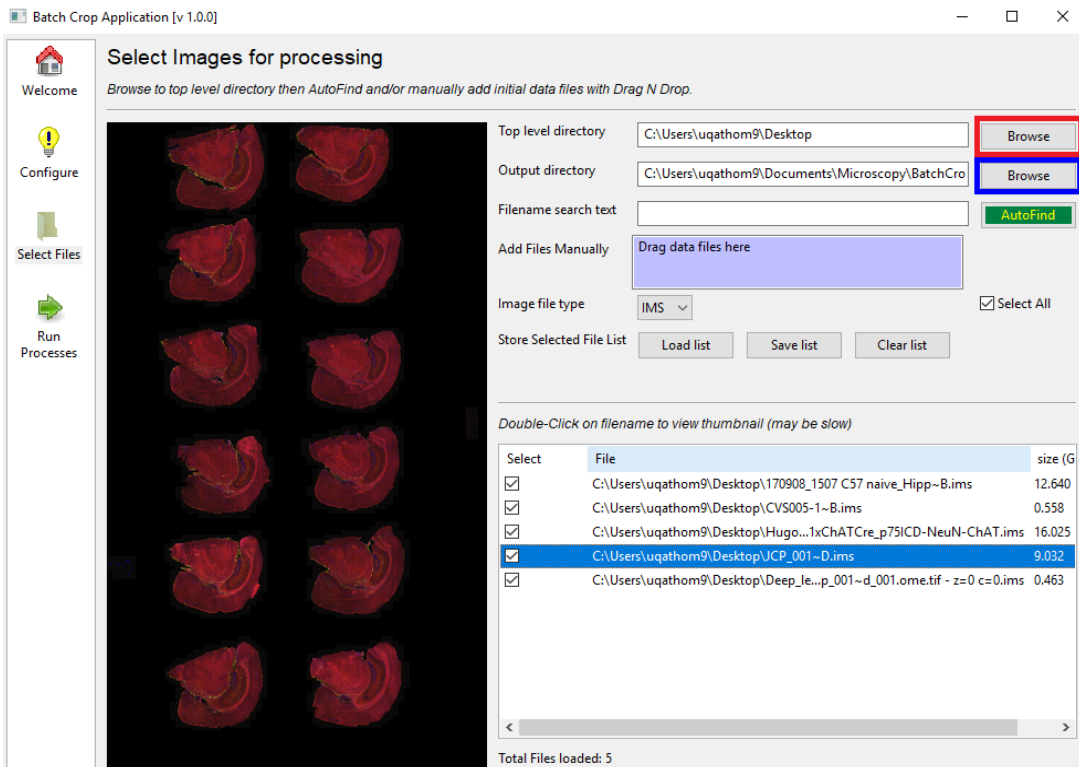
- The “Configure” screen is where you will make any changes to the configuration such as adjusting the amount of border to apply or changing the ‘auto’ thresholding to a specific grey value (eg. 20). You can also choose to output your cropped images in ‘High’ resolution, ‘Low’ resolution or ‘Both’ (default = Both). You must Run the program as an Administrator then click “Save Changes” to apply any changes in this configuration.



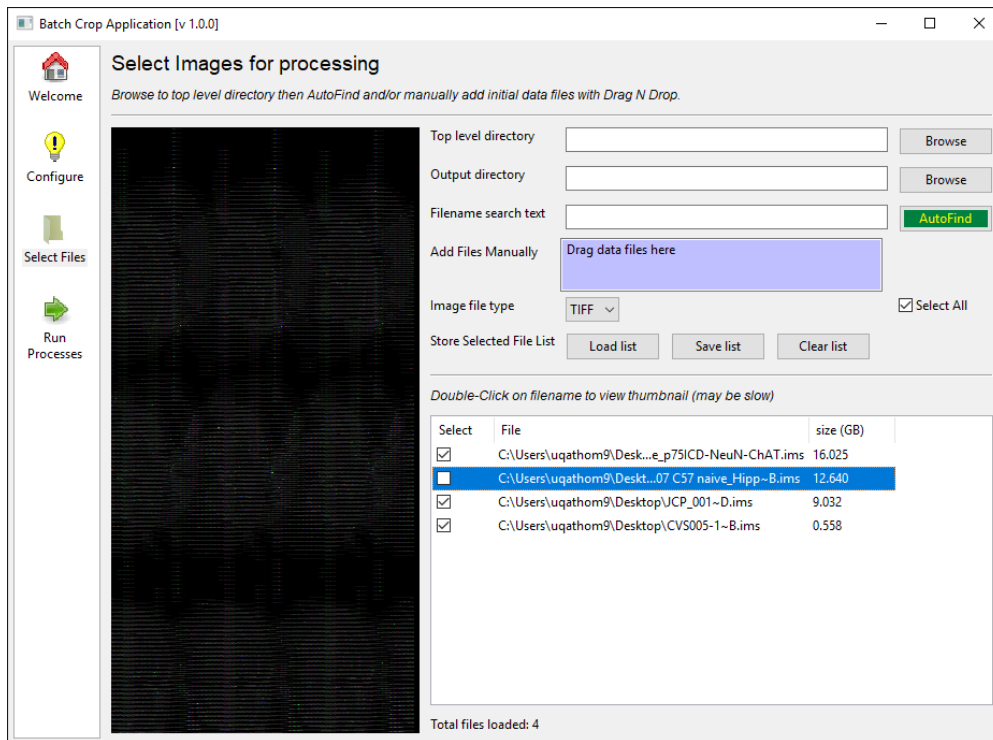
- The “Select Files” window:



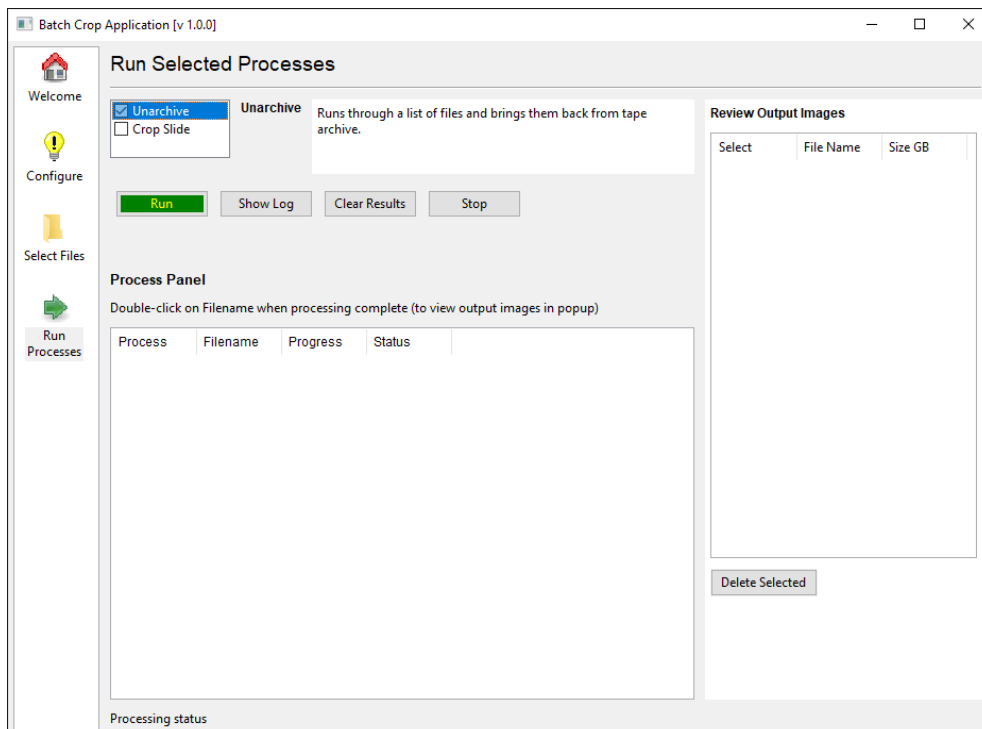
- Select the directory with the ‘.ims’ files you wish to crop (red). This can be on the server (eg. group_microscopy if the network location is mapped). Then click the green “AutoFind” button to load all ‘.ims’ files in the folder. Next, select the directory where you would like the cropped ‘.tiff’ files to be saved (blue). You then have the option to search only for a particular subset of files with a given string in the filename, eg. all files with the text “CA1” in the filename. Alternatively you can just ‘Add Files Manually’ by dragging and dropping where indicated. You can then double-click on an image to see a preview of it on the left:



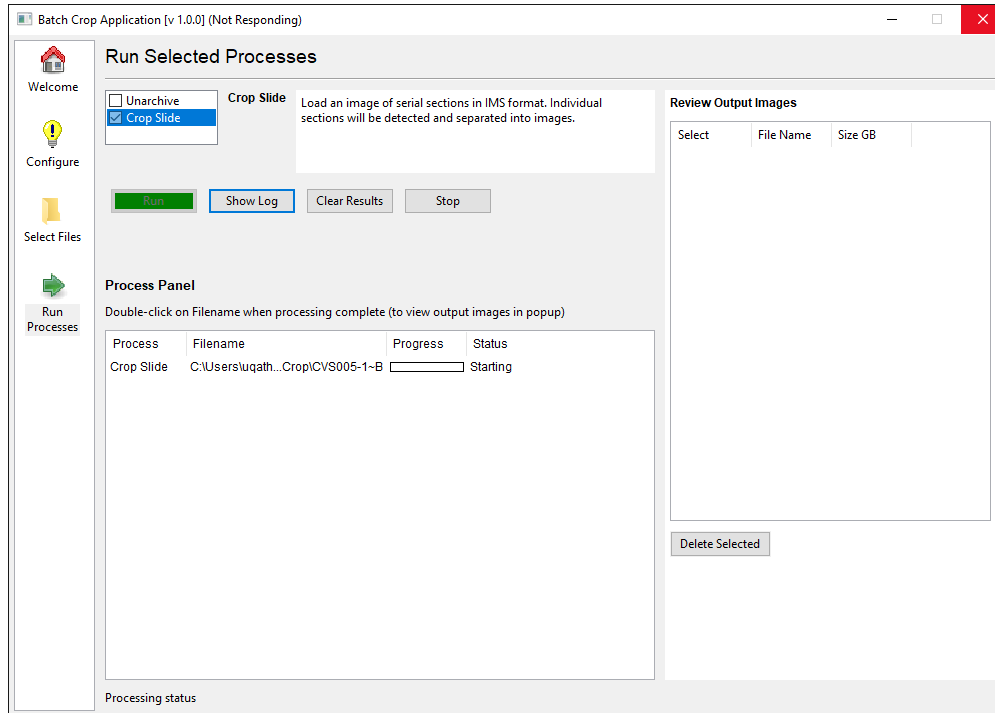
- 4-channel images will not display correctly at this point, but they will be cropped properly during processing:



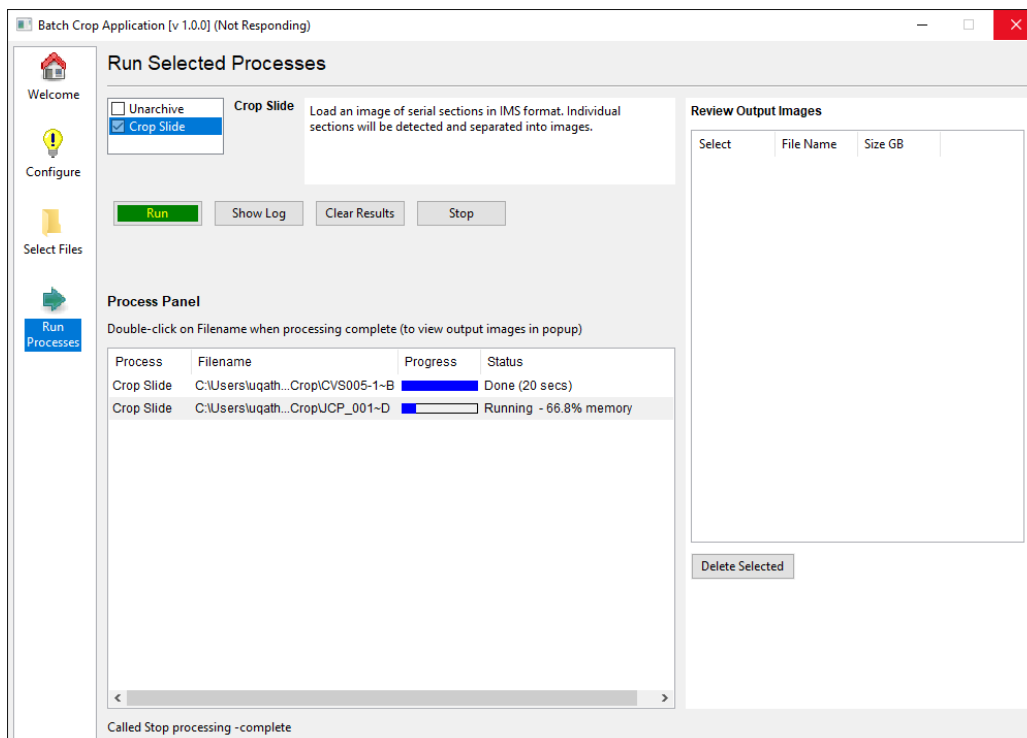
- The “Run Processes” window:



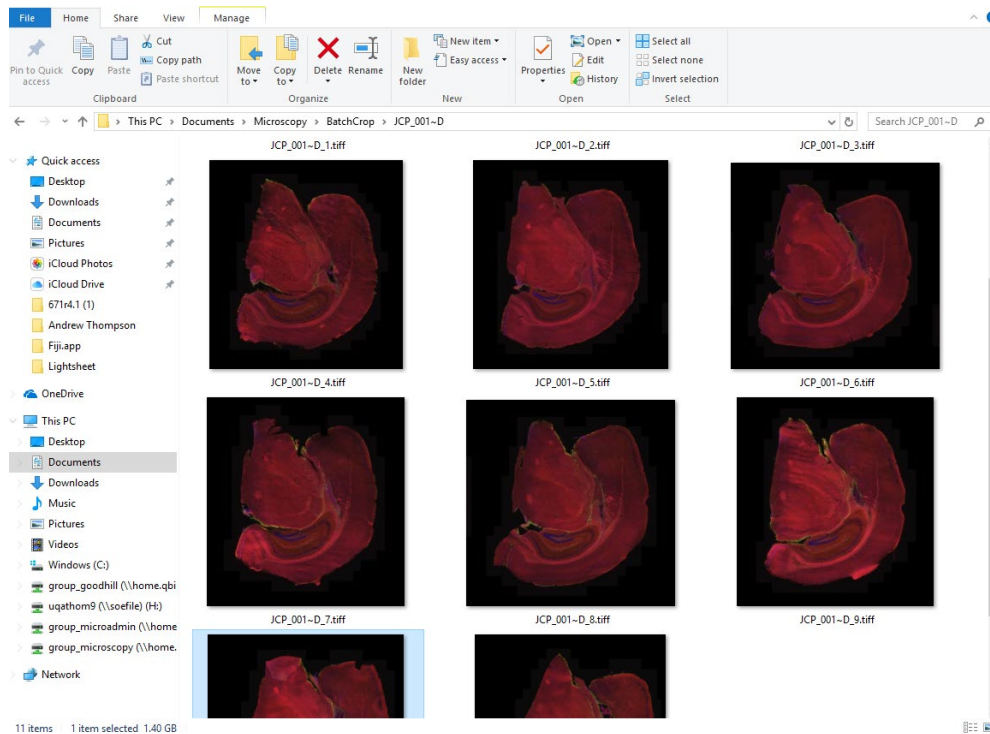
- The “Unarchive” process simply “opens” and “closes” the ‘.ims’ file on the network (eg. group_microscopy). This is necessary if the file has not been accessed on the network recently, meaning it will have been transferred to tape archive and needs to be retrieved (a slightly slow process). These files will then be accessible on the local network and able to be opened/closed much faster (you may have noticed this previously when accessing old files on the group shares).
- The “Crop Slide” process performs the cropping. Tick this and click the green “Run” button to process images:



- It will step through the files you have ticked in the “Select Files” window and spit out the images in your selected “Output folder”:



- This should give you all the images in .tiff format in your output directory:

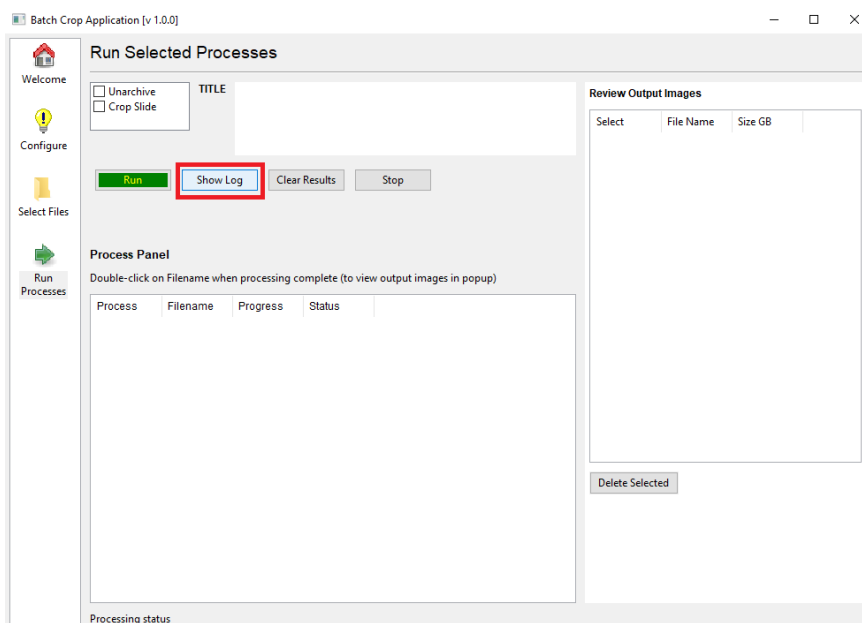


- By default, 3 channel images are processed as 'RGB' images, while 4 channel images will be processed as a multi-page .tiff. If the sections are very large, 3 channel images will also be exported as multi-page .tiff files.

This program should work just as effectively for Brightfield Slide Scanner images or Fluorescent Slide Scanner images.

This is a very RAM intensive program, especially when cropping large images from your files so please be aware of this.

If your sections are mounted too close together on the slide, automatic thresholding will struggle to separate them and will therefore generate large images with multiple sections. You can see what value was used for thresholding in the Log file:



```
Log Viewer
[2018-06-11 15:57:21,058 INFO ]Thread-1 SlideCropperAPI.py (run 90) Run: cropping done - new images in C:\Users\uqathom9\Documents\Microscopy\BatchCrop [2 pages]
[2018-06-11 15:57:21,058 INFO ]Thread-1 SlideCropperAPI.py (run 99) Run finished
[2018-06-11 15:57:21,058 INFO ]Thread-1 controller.py (run 118) Complete: C:\Users\uqathom9\Desktop\CV5005-1-B.ims
[2018-06-11 15:57:21,058 INFO ]Thread-1 controller.py (run 127) Finished ProcessThread
[2018-06-11 15:57:25,487 DEBUG ]MainThread controller.py (poll 188) ControllerRunProcess (t.alive): [Crop Slide] C:\Users\uqathom9\Documents\Microscopy\BatchCrop\CV5005-1-B (62.9% memory)
[2018-06-11 15:57:25,487 INFO ]MainThread controller.py (RunProcess 241) Load Process Threads: Crop Slide C:\Users\uqathom9\Desktop\JCP_001-D.ims [row: 1]
[2018-06-11 15:57:25,487 DEBUG ]MainThread utils.py (findResourceDir 43) Resources dir located to: C:\Program Files\QBI Batch SlideCropper\autoanalysis\resources
[2018-06-11 15:57:25,497 INFO ]MainThread SlideCropperAPI.py (__init__ 29) Image file loaded from C:\Users\uqathom9\Desktop\JCP_001-D.ims
[2018-06-11 15:57:25,497 DEBUG ]Thread-2 SlideCropperAPI.py (setConfigurables 71) SlideCropperAPI:Config loaded
[2018-06-11 15:57:25,497 INFO ]Thread-2 controller.py (run 102) Configuration set
[2018-06-11 15:57:25,497 INFO ]Thread-2 controller.py (run 106) Running: C:\Users\uqathom9\Desktop\JCP_001-D.ims
[2018-06-11 15:57:25,497 INFO ]Thread-2 ImaInsiImage.py (__init__ 34) ImaInsiImage: H5 loaded: C:\Users\uqathom9\Desktop\JCP_001-D.ims
Resolution levels: 8 (selected: 7)

[2018-06-11 15:57:25,507 INFO ]Thread-2 ImageSegmenter.py (_construct_mean_channelled_image 107) Image for segmenting does not contain multiple channels.
[2018-06-11 15:57:25,517 INFO ]Thread-2 ImageSegmenter.py (_apply_cluster_threshold 208) DARK bg-threshold=25
[2018-06-11 15:57:25,617 INFO ]Thread-2 ImageSegmenter.py (_apply_object_detection 275) ObjectDetection: Features found: 12. Segments created: 11
[2018-06-11 15:57:25,617 INFO ]Thread-2 TIFFImageCropper.py (__init__ 47) SlideCropperAPI: run: Image segmentation created 11 segments
[2018-06-11 15:57:25,617 INFO ]Thread-2 ImageSegmentation.py (get_scaled_segments 64) Scalefactors: wx128 hx128 [124160 x 74880] with border=2 to initial [1024 x 640] offset=0.0
[2018-06-11 15:57:25,617 DEBUG ]Thread-2 ImageSegmentation.py (get_scaled_segments 69) Orig xy: [[295 0 446 135]
[ 90 0 249 293]
[301 158 464 293]
[ 84 311 245 458]
[312 322 465 463]
[315 475 462 624]
[108 489 258 629]
[315 632 470 789]
[ 96 647 248 788]
[317 816 466 967]
[ 93 816 247 969]]
[2018-06-11 15:57:25,617 INFO ]Thread-2 ImageSegmentation.py (get_scaled_segments 76) Segmented area: 969 x -48 [-0.0750 0.9463]
[2018-06-11 15:57:25,617 DEBUG ]Thread-2 ImageSegmentation.py (get_scaled_segments 83) Border xy:[[279 -16 462 151]
[ 74 -16 265 309]
[285 142 480 311]
[ 68 295 261 474]
[296 306 481 479]
[299 459 478 640]
[ 92 473 274 645]
[299 616 486 805]
[ 80 631 264 804]
[301 800 482 983]
[ 77 800 263 983]]
[2018-06-11 15:57:25,617 DEBUG ]Thread-2 ImageSegmentation.py (get_scaled_segments 92) Scaled xy:[[ 35712 -2048 59136 19328]
```

We hope this new slide cropping program is beneficial to researches at QBI. Feedback on this new program is encouraged, though we are not programmers and we no longer employ a Research Software Developer at QBI so please be aware any updates we deem necessary may be slow to implement.

Requirements

- Windows 7 Service Pack 1, Windows 8 or Windows 10
- At least 16Gb RAM
- Visual C++ Redistributable for Visual Studio 2015 (<https://www.microsoft.com/en-in/download/details.aspx?id=48145>) – if this is not installed, QBI BatchCrop will fail to open citing a missing .dll file

Acknowledgements

QBI Microscopy Facility would like to give a huge thank you to Mr Jack Eadie and Dr Liz Cooper-Williams, who put an incredible amount of work into developing BatchCrop for QBI researchers.