

Focus Stacking: Workflow with Open Source Program Focus-Stack

For details, see here: [Focus-Stack Documentation](#)

Installation

1. Download: [Focus-Stack Windows Release](#)
2. Download: fs.zip (contains test data and the scripts aaajpg.cmd aaatif.cmd for processing *jpg* resp. *tif* images)
3. Unpack the contents of both to any directory.
4. Create a directory named *work* within the program directory.
5. Within work create a directory names *r*

Directory structure after installation:

```
1 Directory of f:\Programs\focus-stack (root directory)
2
3 01/29/2025 11:21 AM          4,118,714 3dview.png
4 12/28/2024 08:07 PM          265,403 denoised_merge_result.jpg
5 12/25/2024 09:37 PM      <DIR>          depthmap
6 12/28/2024 08:07 PM          384,450 depth_inpaint_filled.png
7 12/28/2024 08:07 PM          111,917 depth_inpaint_lines.png
8 12/28/2024 08:07 PM          22,804 depth_inpaint_lr_out.png
9 12/28/2024 08:07 PM           5,619 depth_inpaint_lr_points.png
10 12/28/2024 08:07 PM          62,359 depth_inpaint_mask.png
11 12/28/2024 08:07 PM          68,566 depth_inpaint_masked.png
12 12/28/2024 08:07 PM          34,342 depth_inpaint_points.png
13 12/25/2024 09:37 PM      1,694,208 focus-stack.exe
14 12/25/2024 09:37 PM          11,659 focus-stack.html
15 12/28/2024 08:07 PM          771,480 gauss_amp.png
16 12/28/2024 08:07 PM          923,217 gauss_dev.png
17 12/28/2024 08:07 PM          911,687 gauss_mean.png
18 01/31/2025 12:15 PM           111 aaajpg.cmd (script for program
   execution)
19 01/31/2025 12:15 PM           111 aaatif.cmd (script for program
   execution)
20 12/25/2024 09:37 PM          620,544 jpeg62.dll
21 01/29/2025 11:34 AM           7,225 l.log
22 12/25/2024 09:37 PM          156,160 liblzma.dll
23 12/25/2024 09:37 PM          197,120 libpng16.dll
24 12/25/2024 09:37 PM          487,936 libprotobuf-lite.dll
25 12/25/2024 09:37 PM      2,426,368 libprotobuf.dll
26 12/25/2024 09:37 PM      2,183,168 libprotoc.dll
27 12/25/2024 09:37 PM           1,066 LICENSE.txt
28 12/25/2024 09:37 PM      2,138,112 opencv_calib3d.dll
29 12/25/2024 09:37 PM      3,461,120 opencv_core.dll
30 12/25/2024 09:37 PM      3,701,760 opencv_dnn.dll
31 12/25/2024 09:37 PM          759,808 opencv_features2d.dll
32 12/25/2024 09:37 PM          418,304 opencv_flann.dll
33 12/25/2024 09:37 PM          287,232 opencv_highgui.dll
```

```

34 12/25/2024 09:37 PM          304,128 opencv_imgcodecs.dll
35 12/25/2024 09:37 PM      4,866,560 opencv_imgproc.dll
36 12/25/2024 09:37 PM          553,472 opencv_ml.dll
37 12/25/2024 09:37 PM          694,272 opencv_objdetect.dll
38 12/25/2024 09:37 PM          635,392 opencv_photo.dll
39 12/25/2024 09:37 PM          757,248 opencv_stitching.dll
40 12/25/2024 09:37 PM          649,728 opencv_video.dll
41 12/25/2024 09:37 PM          513,024 opencv_videoio.dll
42 12/25/2024 09:37 PM           5,944 README.txt
43 12/25/2024 09:37 PM          443,904 tiff.dll
44 12/25/2024 09:37 PM          696,320 turbojpeg.dll
45 12/25/2024 09:37 PM          371,200 webp.dll
46 12/25/2024 09:37 PM          159,744 webpdecoder.dll
47 12/25/2024 09:37 PM           20,480 webpdemux.dll
48 12/25/2024 09:37 PM          39,936 webpmux.dll
49 01/29/2025 10:57 PM    <DIR>          work
50 12/25/2024 09:37 PM          89,088 zlib1.dll
51          48 File(s)    37,401,342 bytes
52
53 Directory of f:\Programs\focus-stack\work (Directory with input data)
54 01/29/2025 10:57 PM    <DIR>          r
55 01/29/2025 10:53 PM      1,953,783 2025-01-29-22-53-54.jpg (input image)
56 01/29/2025 10:54 PM      1,921,067 2025-01-29-22-54-04.jpg (input image)
57 01/29/2025 10:54 PM      1,799,893 2025-01-29-22-54-12.jpg (input image)
58 01/29/2025 10:54 PM      1,698,658 2025-01-29-22-54-18.jpg (input image)
59 01/29/2025 10:54 PM      1,681,539 2025-01-29-22-54-26.jpg (input image)
60 01/29/2025 10:58 PM      3,353,412 3dview.png
61 01/29/2025 10:58 PM          458,836 depthmap.png
62 01/29/2025 10:57 PM          728,678 output.jpg (generated output image)

```

Capture Input Images

In my case, pictures are taken with a microscope camera as follows:

1. Prepare the object and place it securely under the camera.
2. Focus on the top focal point and take a picture.
3. Move the focus plane down until the next level of the object is sharp, and take the next picture.
4. Repeat step 3 for each level of the object to be shown in the final image (avoid taking too many pictures; only capture those that focus on important parts).

Images should be captured in the order of the focal movement sequence from top to bottom, ensuring that all other factors remain as consistent as possible aside from the movement:

- Same magnification
- Same crop
- Same exposure
- Same color balance

The alphabetical order of the image file names should correspond to the chronological sequence.

Create Improved Image

1. Delete all existing files in the *work* folder.

2. Copy captured images to the *work* folder.

3. Execute `aaa.cmd`.

4. Check the result in `output.jpg` and improve it if necessary (e.g., using Photoshop).

