

Dataset Structure and File Specification

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Two Photon Structural Stacks

There is one mesoscope structural stack saved as TIF files at the original resolution and spatially upsampled version. These two files are titled `two_photon_stack_17797_9_19_v1.tiff` (~1.2 GB) and `two_photon_stack_17797_9_19_resized_v1.tiff` (~9.3 GB), respectively. The naming convention of these two files is `two_photon_stack_AAAAA_B_C_D_vE.tiff`, where A is the animal id, B is the session id, C is the stack id, D indicates if the stack is resized, and E is the version. Approximately 30 minutes prior to collecting the stack, the animal was injected subcutaneously with Dextran Texas Red fluorescent dye. The stack was composed of 30 repeats of three $1300 \times 620 \mu\text{m}^2$ fields per depth in two channels (green and red, respectively), tiling a $1300 \times 1400 \mu\text{m}^2$ field of view ($460 \mu\text{m}$ total overlap) at 335 depths from $21 \mu\text{m}$ above the surface to $649 \mu\text{m}$ below the surface. Enhanced and sharpened fields were independently stitched at each depth, then independently horizontally and vertically aligned by maximizing the correlation of the cross-power spectrum of their Fourier transformations. The cumulative alignment was detrended to remove the influence of vessels passing through the fields. The resulting transform was applied to the original average images resulting in a structural two photon $1322 \times 1412 \times 670 \mu\text{m}^3$ volume at $0.5 \times 0.5 \times 0.5 \text{ px}/\mu\text{m}^3$ resolution in both red and green channels. This stack was saved as a TIF file at the original resolution (total size $670 \text{ px} \times 661 \text{ px} \times 706 \text{ px}$) and at a spatially upsampled resolution of $1 \times 1 \times 1 \text{ px}/\mu\text{m}^3$ using bilinear interpolation (total size $1340 \text{ px} \times 1322 \text{ px} \times 1412 \text{ px}$). The size of each tiff stack is $D \times H \times W$, where $H \times W$ roughly correspond to the lateral-to-medial and posterior-to-anterior axis of the stack, respectively, at the original pixel resolution. D is the imaging channels \times imaging depths, with the ordering of each image in the TIF stack as follows:

Slice 1 Channel 1
Slice 1 Channel 2
Slice 2 Channel 1
Slice 2 Channel 2

Changelog

v3 (7/2/2021): first public version