Per-sample mosaic datasets
- 3-channel .bmp mosaic images with Chromium .Align files
+
- Chromium .scancsv shotlist files

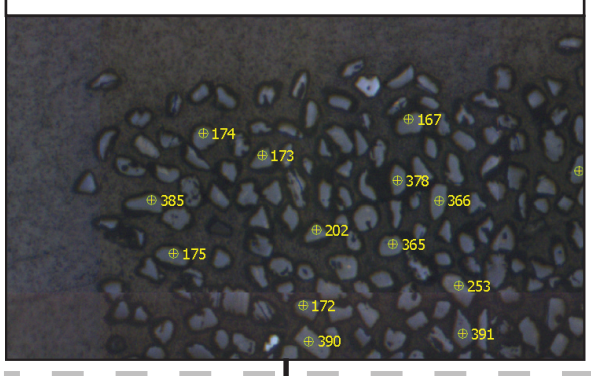
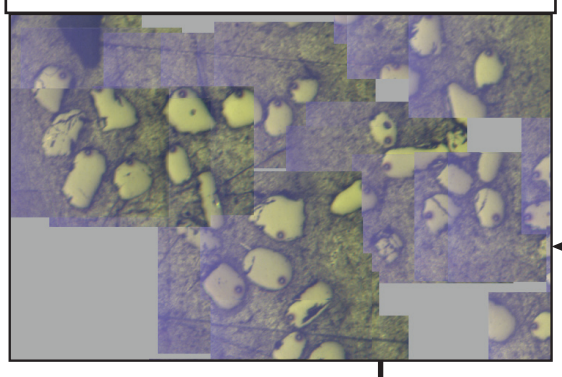


Image-per-shot datasets
- 3-channel .jpg, .png, .bmp, or .tif shot-centred images
+
- Per-image Chromium .Align files

OR
- Known image scale(s)



Other datasets
- 3-channel .jpg, .png, .bmp, or .tif images
+
- Known image scale(s) (µm/pixel)

Align, scale, and/or select shot locations in Chromium Offline

Clip and save shot-centred images with unique file-names (e.g., using ImageJ)

Dataset inputs **(a)**

Create project directory, then:
- Upload project directory to Google Drive; run notebooks in Colab

OR
- Download, run notebooks locally (see GitHub installation directions)

Create project directory

Dataset preparation **(b)**

File names contain sample names?

No → Organize files into subdirectories by sample

Yes → Place image files in a single subdirectory

.Align scaling files available?

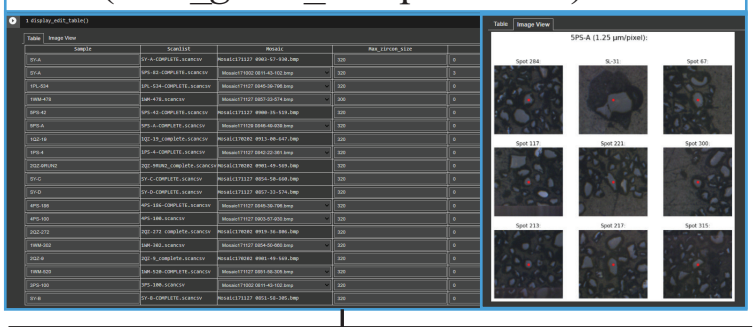
Yes

No → Add per-sample scales (µm/pixel) to *sample_info.csv* file

- Upload project directory to Google Drive; run notebooks in Colab

OR
- Download, run notebooks locally (see GitHub installation directions)

Mosaic_match *notebook*
- Match .scancsv files to mosaics
- Correct .scancsv misalignment
- Define processed subimage size (*Max_grain_size* parameter)



Automatically generate *mosaic_info.csv* file

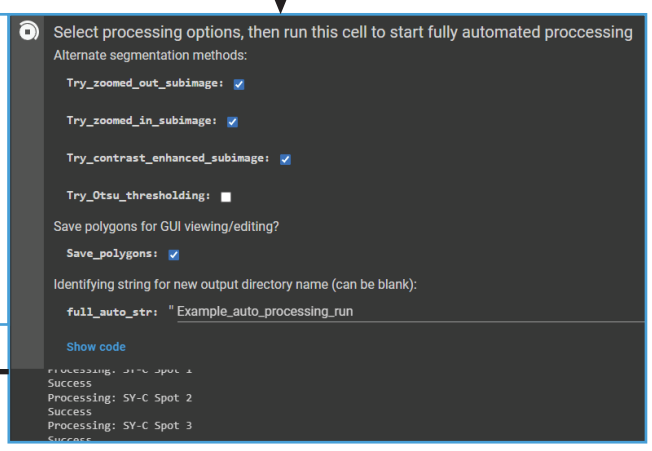
Mosaic_grain_process *notebook*

Single_shot_image *notebook*

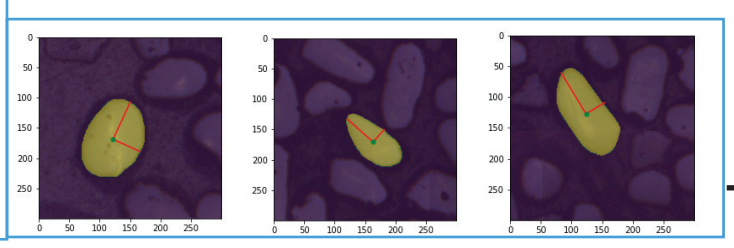
(c)

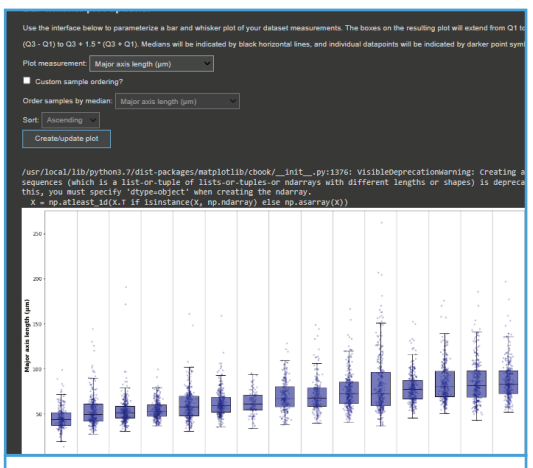
Dataset processing

Fully automated segmentation
- Load dataset and select samples
- Automatically load models
- View trial segmentaion results
- Parameterize segmentation
- Run automated segmentation



Outputs:
- .csv files for each sample with measured per-grain shape parameters
- Mask polygon .json files for loading in GUI
- Verification images

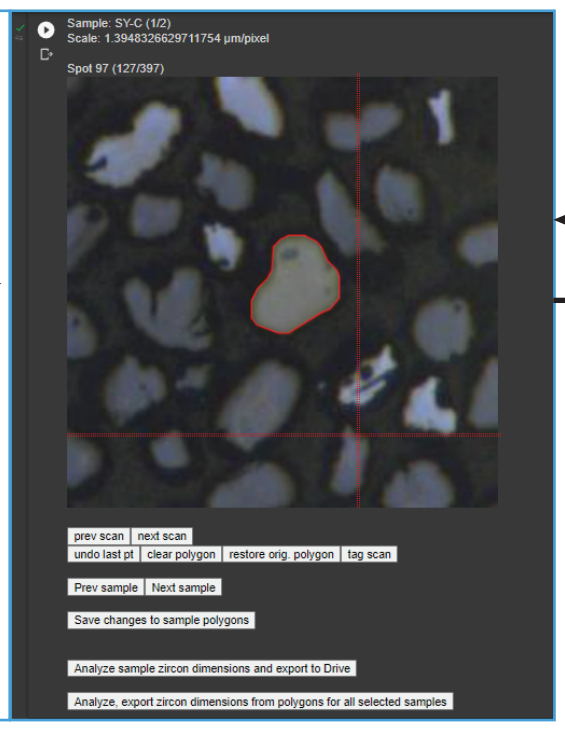




Exploratory Data Visualization UI
- Load any colab_zirc_dims measurement results from project directory
- Filter dataset before plotting (e.g., include or exclude spot names based on string inputs)
- Parameterize, create, and view exploratory plots (bar-whisker, histogram, and scatter) of filtered dataset

Semi-automated segmentation GUI
- Load automatically generated grain mask polygons from current or prior session

OR
- Load semi-automatically generated polygons from a prior session

OR
- Automatically generate per-sample polygons on the go

THEN
- View, ‘tag’, and/or edit polygons
- Save polygons to project directory
- Generate and export measurements from polygons to project directory