Cell Segger v.1.0

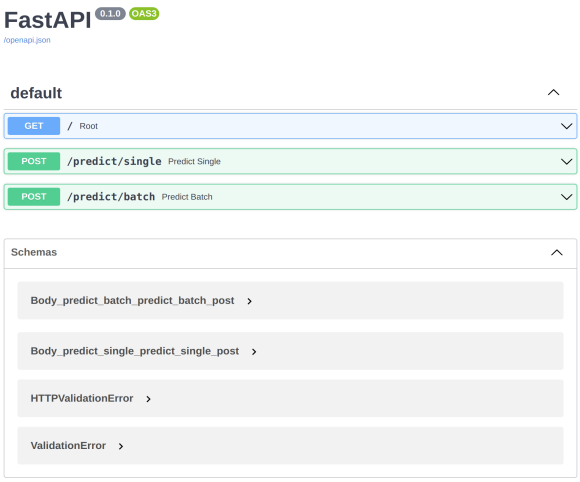
Jingqi Duan, Ph.D.
July 1, 2023

Cell Segger is a program to predict cell boundaries for cells in microscope images. It uses a pretrained UNet model to perform the prediction. In the version 1.0, only images in grayscale or color mode are accepted for an accurate prediction for them, for example, DIC and fluorescence microscope images; Images have single channel. Fluorescence images were usually captured in multi-channel mode and channels should be merged; The output image which is in binary contains predicted masks for cells in the input image; Together with output image, there will be a csv file named 'images.csv' which contains image metadata and run length encoded predicted masks, and a plain text file named 'welcome.txt' containing my greetings and contact information.

Cell Segger is currently deployed on a GPU workstation on Paperspace. Users can access Cell Segger in two ways: an API through the address 'http://64.62.255.225:8000/docs' in any internet browser, and a streamlit interface through the address 'http://64.62.255.225:8501'.

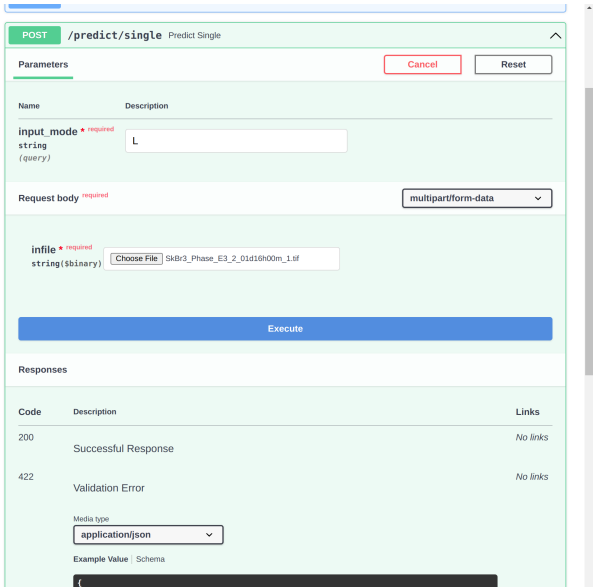
Cell Segger API

The Cell Segger API looks like the following. For single image prediction, use '/predict/single'; and batch prediction, use '/predict/batch'.

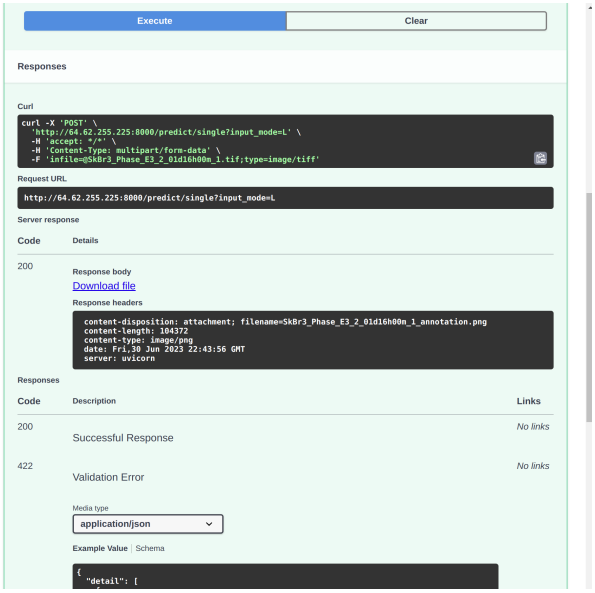


1. Cell Segger prediction on a single image.

Collapse the '/predict/single' tab, hit 'Try it out'. In the input_mode field, fill 'L' for grayscale image, 'RGB' for color image. Upload image to the infile field. Hit 'Execute'.

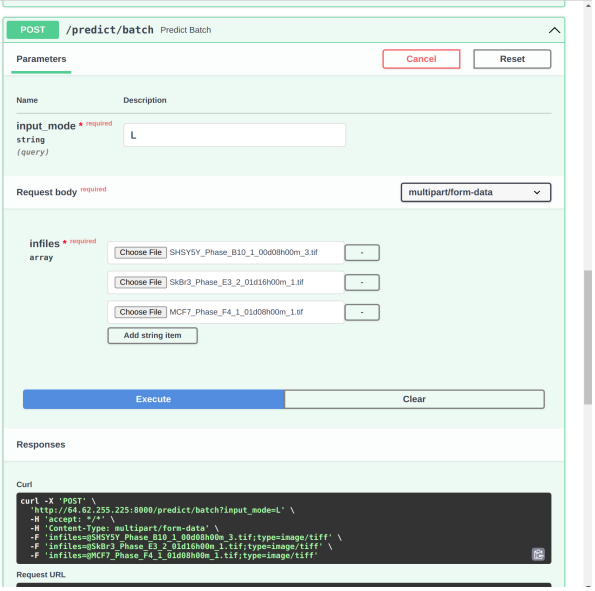


If the prediction is successful, the response code will be ‘200’. Hit ‘Download file’ to save the image containing the predicted masks to a local file.

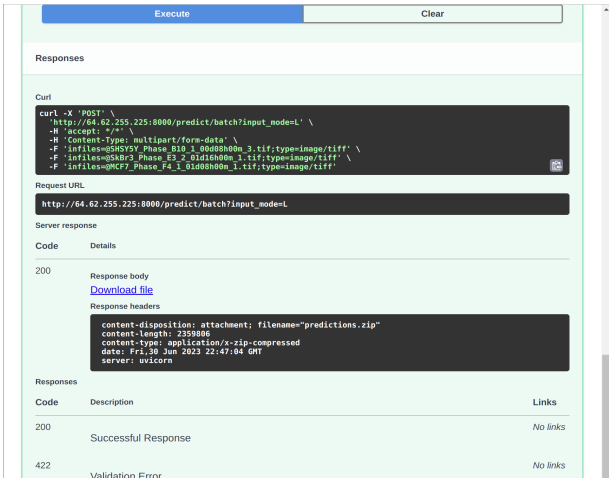


2. Cell Segger batch prediction

Collapse the ‘/predict/batch’ tab, hit ‘Try it out’. Upload images to the infile fields. Hit ‘Execute’.



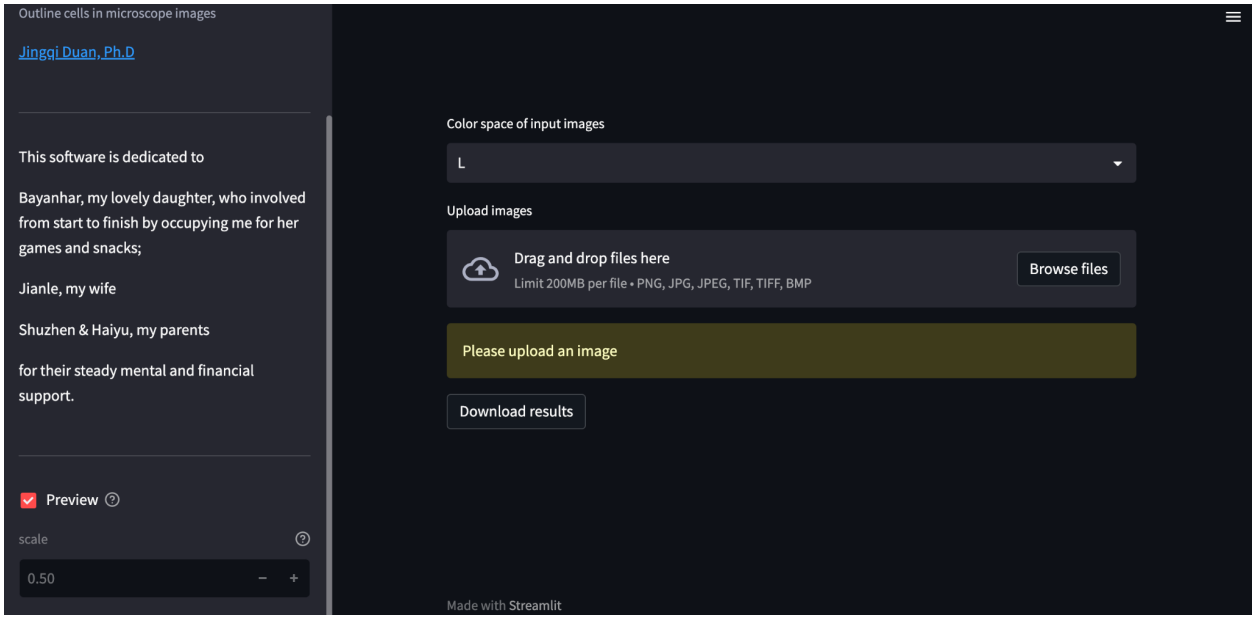
After prediction is done, download the predicted image.



Cell Segger streamlit UI

The Cell Segger UI looks like the following.

If users want to preview the image and its predicted masks, check the ‘Preview’ radio. It will take extra time to display the result. Specify the color space of the input image from the drop down menu, upload the images, Cell segger will automatically start to do the prediction.



An example of a predicted result for a color image looks like the following. Users can download the results.