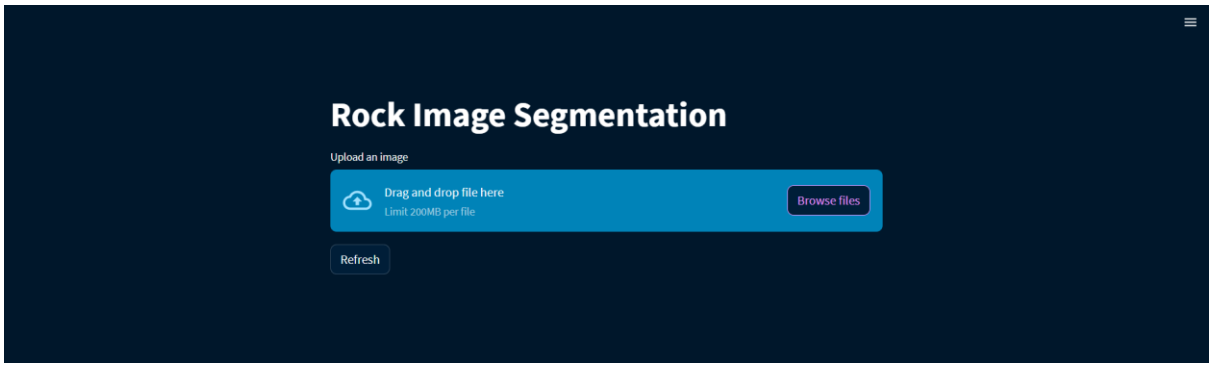
Workflow

The workflow of the Web application for the image processing model is defined as follows:

1: Image uploader and refresh button:

After logging in with the correct credentials, the following interface will be shown to the user:

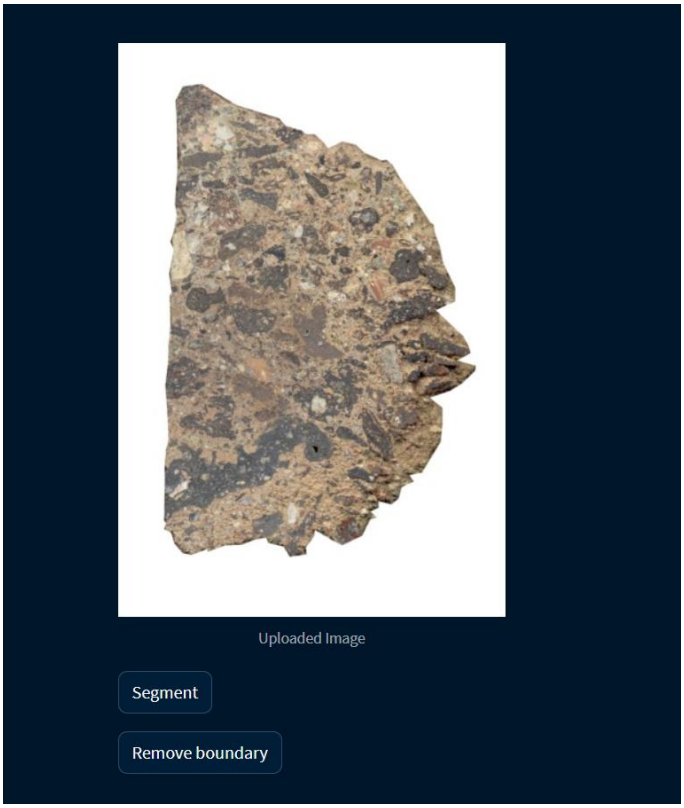


The user can upload any type of image by clicking the **'Browse Files'** button on the screen, but the image size should be restricted to **200 MB**.

The 'Refresh' button can be used at any point to remove all the data and images visible on the screen.

2: Segment button:

Once the image is uploaded, two new buttons will be shown to the user, as shown below:



When the '**Segment**' button is clicked, the model will start processing the image to create individual binary images for the lithics, vitreous/glass clast, and groundmass.

The time taken in this process depends on the resolution of the uploaded image.

3: Download buttons:

Once the model finishes processing, the respective binary images will be shown as Image 1, Image 2, and Image 3, respectively, along with their download buttons, as shown below:

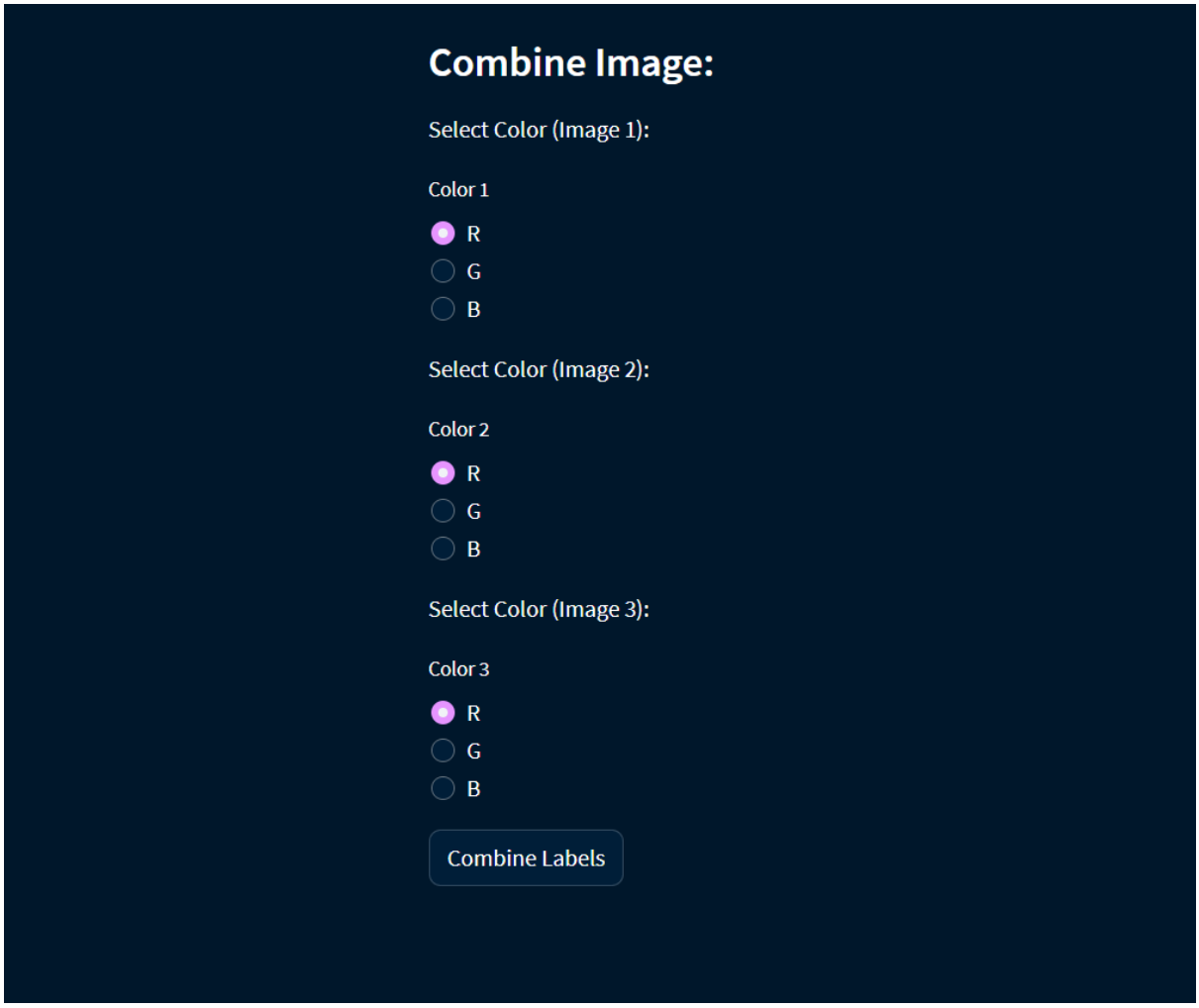
The user can download these images by clicking on the '**Download Image'** buttons.

4: Color selection and Combine labels button:

Just below the 'Download Image' buttons, as mentioned above, there will be a color selection section that can be used to assign different colors to these binary images if the user wants a combined image of all three (lithics, vitreous/glass clast, and groundmass) images.

By pressing the '**Combine Labels'** button after appropriate color selection, the model will process a combined RGB image segmenting all three phases.

The user can download this image as well.



If the user does not want to proceed with this image-combining step, they can click on the refresh button placed at the top to start from the beginning.

5: Remove boundary button:

This step would be used at the time of the analysis of these binary images with the help of ImageJ.

After the manual intervention step (if required) on the resultant binary images, the user can upload the image in the same file uploader and select the '**Remove boundary**' button

to get a no-boundary image corresponding to the actual binary image.