1. SIVP

Functions：SIV\_budding\_num\_2.m;

SIV\_Fluorescent.m;

SIV\_hole\_area.m;

SIV\_other.m;

SIV\_function\_all.m;

minboundrect.m;

main.m;

Inpoly.m

* 1. Download the above functions under the same folder;
  2. Open main.m with matlab, modify the pathname;

scrDir：the folder used to store the pending pictures(This folder path can also be unmodified, and when you run the code, the folder option to select will pop up, and then select the folder where the image to be processed is located).

output\_xlsx\_path: Save the Excel file path of the extracted features, the path must be modified, and after the run, the Excel sheet will be under the folder of the path.

1.3 Open SIV\_function\_all.m with matlab, modify the image format(png or bmp);

1.4 Run main.m, the results are saved in the output path.

1. CBV

Functions：CBV\_branch\_point.m;

CBV\_Fluorescent.m;

CBV\_Vessel\_area.m;

CBV\_branch\_point\_100.m;

CBV\_function\_all.m;

minboundrect.m;

main.m;

Inpoly.m

* 1. Download the above functions under the same folder;
  2. Open main.m with matlab, modify the pathname;

scrDir：the folder used to store the pending pictures.(This folder path can also be unmodified, and when you run the code, the folder option to select will pop up, and then select the folder where the image to be processed is located)

output\_xlsx\_path: Save the Excel file path of the extracted features, the path must be modified, and after the run, the Excel sheet will be under the folder of the path.

2.3 Open CBV\_function\_all.m with matlab, modify the image format(png or bmp);

2.4 Run main.m, the results are saved in the output path.

1. CCV

Functions：CCV.m;

Globularity.m;

minboundrect.m;

Inpoly.m

* 1. Put three functions(Globularity.m,minboundrect.m,Inpoly.m) in the folder where the image is located.
  2. Open CCV.m with matlab, modify the pathname and run the function,the results are saved in the output path.

1. DA,PCV,ISV,CVP

Functions：DA.m;

PCV.m;

ISV.m;

CVP.m;

minboundrect.m;

Inpoly.m

* 1. Put two functions(minboundrect.m,Inpoly.m) in the folder where the image is located.
  2. Open DA.m with matlab, modify the pathname and run the function,the results are saved in the output path.
  3. Open PCV.m with matlab, modify the pathname and run the function,the results are saved in the output path.
  4. Open ISV.m with matlab, modify the pathname and run the function,the results are saved in the output path.
  5. Open CVP.m with matlab, modify the pathname and run the function,the results are saved in the output path.