### تحليل هوشمند تصاوير پزشكى

# تمرین سوم، بخش دوم، گزارش بخش عملی

جواد راضی (٤٠١٢٠٤٣٥٤)

- پایپلاین اصلاح شده با عنوان FixedPipeline اکسپورت گردیده و به همراه پایپلاین اوریجینال ضمیمه تمرین شده اند.
  - فایل پروژه نیز همراه تمرین آپلود شده.
  - تمام خروجی های هر استیج پایپلاین، در دایرکتوری pipeline\_outputs ذخیره شدهاند.

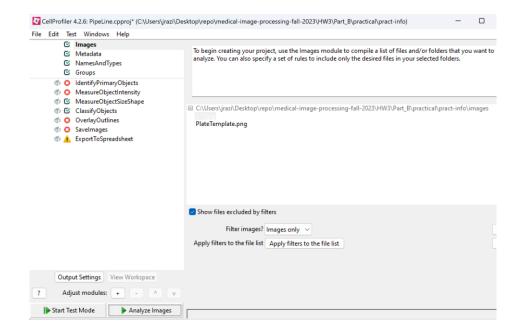
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#### لود پايپلاين:

|   | zi\Desktop\repo\medical-image-processing-fall-2023\HW3\Part_B\practical\pract-info) — 🗆   |
|---|---|
| File Edit Test Windows Help  © Images  © Metadata  © NamesAndTypes  © Groups  Ø O IdentifyPrimaryObjects                      | To begin creating your project, use the Images module to compile a list of files and/or folders that you want to analyze. You can also specify a set of rules to include only the desired files in your selected folders. |
| ◆ MeasureObjectIntensity ◆ MeasureObjectSizeShape ◆ Good ClassifyObjects ◆ OverlayOutlines ◆ SaveImages ◆ ExportToSpreadsheet | Drop files and folders here   |
| Output Settings View Workspace  | Show files excluded by filters  Filter images? Images only   Apply filters to the file list  Apply filters to the file list  ?  |
| ? Adjust modules: + - ^    Start Test Mode  | Found 0 rows  |

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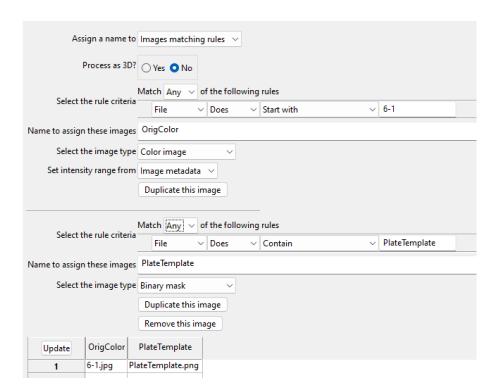
لود تصاویر:



این قسمت خواستهای ندارد.

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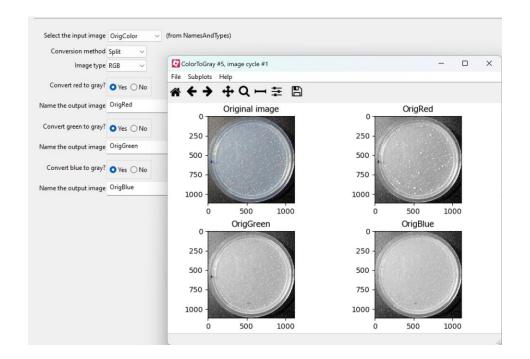
تعيين نام هر تصوير:



این قسمت خواستهای ندارد.

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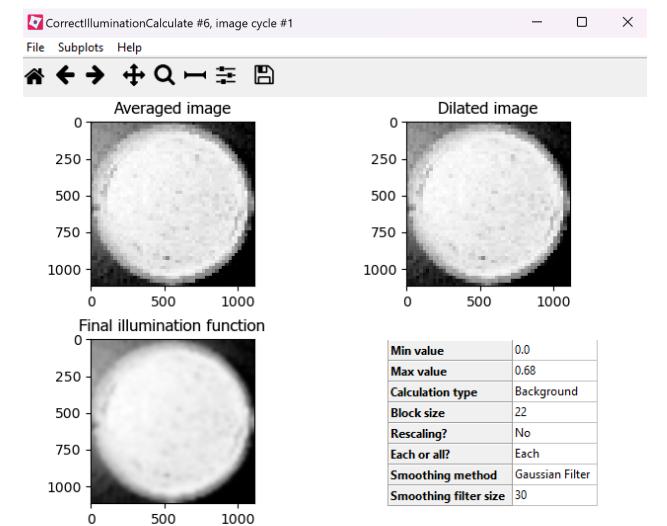
جدا کردن کانالهای تصویر: برای اینکار از منوی edit گزینه Add Module را انتخاب کرده و ماژول خواسته شده را اضافه می کنیم.

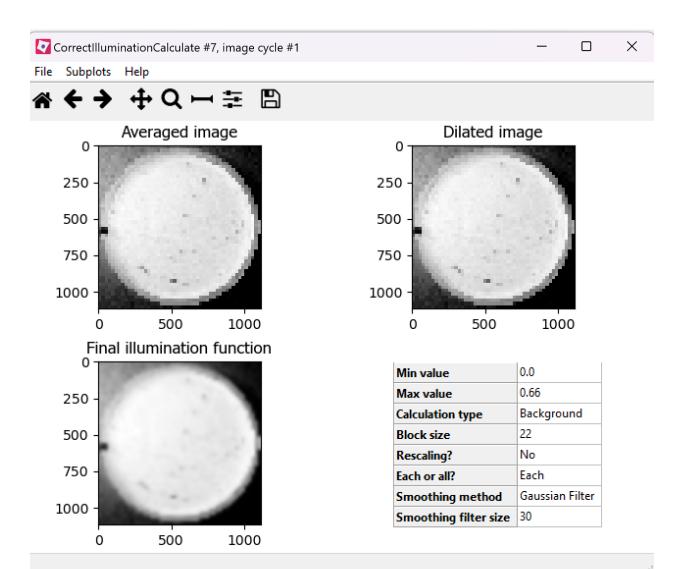


### یک نمونه از پیکربندی ماژول:

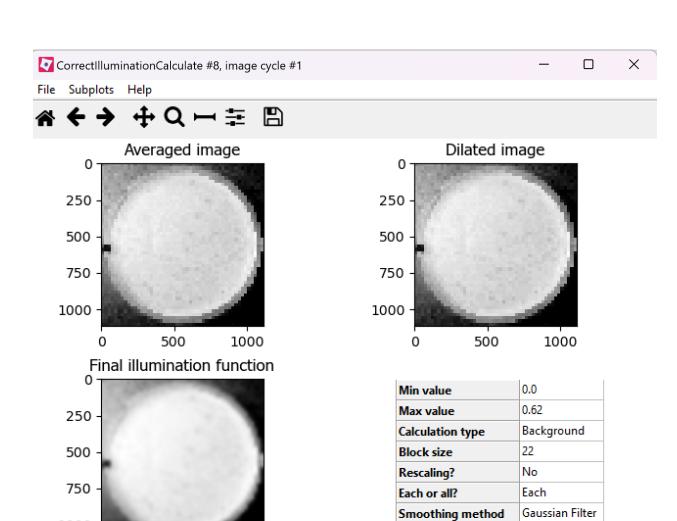
| Select the input image  | OrigBlue          |
|---|-------------------|
| Name the output image   | IllumBlue         |
| Select how the illumination function is calculated                      | Background ∨      |
| Block size  | 22                |
| Rescale the illumination function?                                      | No                |
| Calculate function for each image individually, or based on all images? | Each ~            |
| Smoothing method  | Gaussian Filter ∨ |
| Method to calculate smoothing filter size                               | Automatic ∨       |
| Retain the averaged image?  | ○ Yes <b>○</b> No |
| Retain the dilated image?   | ○ Yes <b>○</b> No |
|   |                   |

تصویر خروجی پس از ماژول مربوط به نور آبی:





ماژول نور قرمز:



1000 -

0

500

1000

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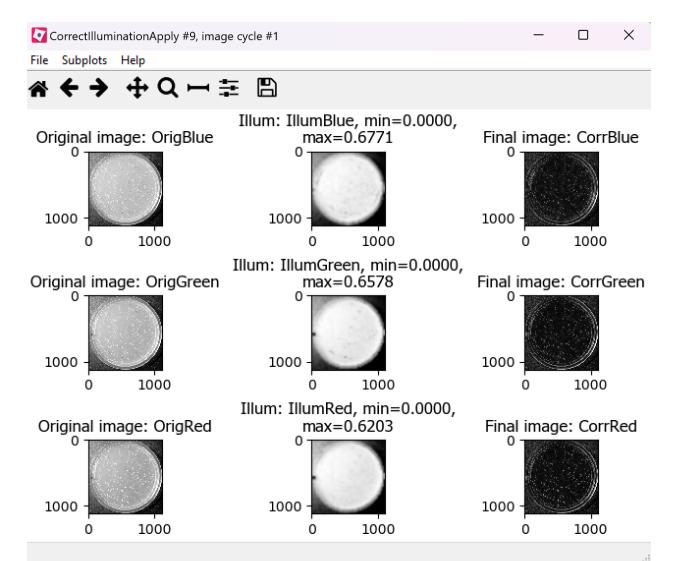
ييكربندي ماژول:

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Smoothing filter size

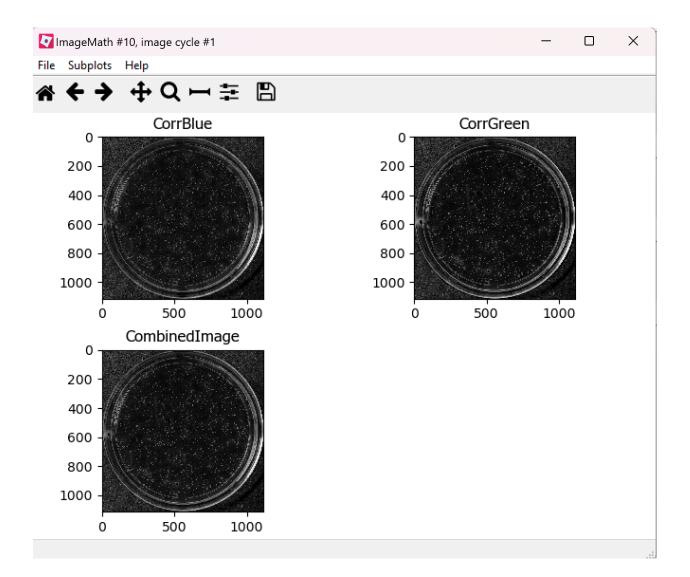
| Select the input image OrigBlue V (from ColorToGray #05)                                |
|---|
| Name the output image CorrBlue  |
| Select the illumination function IllumBlue V (from CorrectIlluminationCalculate #06)    |
| Select how the illumination function is applied $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$ |
| Select the input image OrigGreen  |
| Name the output image CorrGreen   |
| Select the illumination function IllumGreen V (from CorrectIlluminationCalculate #07)   |
| Select how the illumination function is applied Subtract 🗸                              |
| Remove this image   |
|   |
| Select the input image OrigRed v (from ColorToGray #05)                                 |
| Name the output image CorrRed   |
| Select the illumination function   IllumRed   |
| Select how the illumination function is applied $$ Subtract $$ $$ $$                    |
| Remove this image   |
|   |
| Add another image   |
| Set output image values less than 0 equal to 0?    ○ Yes    No                          |
| et output image values greater than 1 equal to 1? Yes No                                |
|   |

تصوير خروجي:



| Operation                        | Add               | ~                          |
|----------------------------------|-------------------|----------------------------|
| Name the output image            | CombinedImage     |                            |
|                                  |                   |                            |
| Image or measurement?            | lmage ~           |                            |
| Select the first image           | CorrBlue ~        | (from CorrectllluminationA |
| Multiply the first image by      | 1.0               |                            |
|                                  |                   |                            |
| Image or measurement?            | lmage ∨           |                            |
| Select the second image          | CorrGreen ~       | (from CorrectllluminationA |
| Multiply the second image by     | 1.0               |                            |
|                                  |                   |                            |
|                                  | Add another image | e                          |
|                                  |                   |                            |
| Raise the power of the result by | 1.0               |                            |
| Multiply the result by           | 0.5               |                            |
| Add to result                    | 0.0               |                            |

تصویر خروجی:



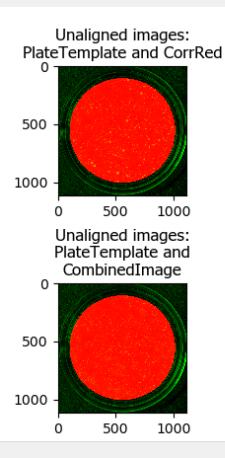
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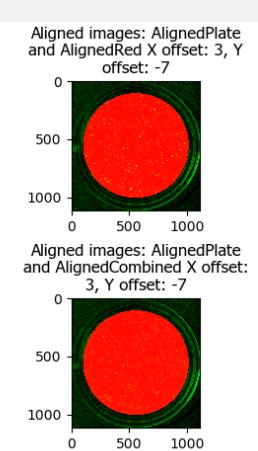
پیکربندی:

| Select the alignment method               | Mutual Information | ~                         |
|---|--------------------|---------------------------|
| Crop mode                                 | Keep size          | ~                         |
| Select the first input image              | PlateTemplate ∨    | (from NamesAndTypes)      |
| Name the first output image               | AlignedPlate       |                           |
|   |                    |                           |
| Select the second input image             | CorrRed ~          | (from CorrectIllumination |
| Name the second output image              | AlignedRed         |                           |
|   |                    |                           |
| Select the additional image               | CombinedImage ∨    | (from ImageMath #10)      |
| Name the output image                     | AlignedCombined    |                           |
| Select how the alignment is to be applied | Similarly ~        |                           |
|   | Remove above image |                           |
|   | Add another image  |                           |
|   |                    |                           |
|   |                    |                           |

تصوير خروجي:



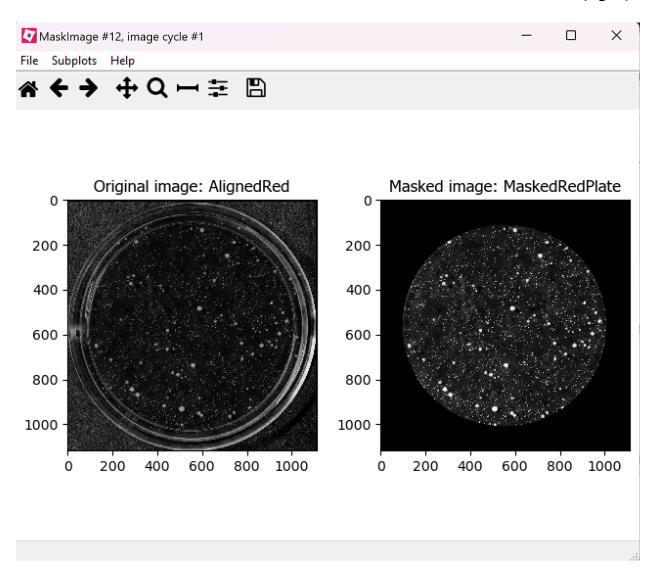




نمونه پيکربندي:

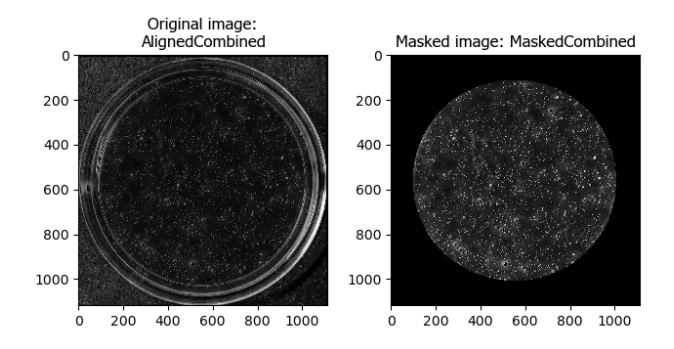
| Select the input image             | AlignedRed        | $\vee$ | (from Align #11)     |
|------------------------------------|-------------------|--------|----------------------|
| Name the output image              | MaskedRedPlate    |        |                      |
| Use objects or an image as a mask? | lmage ∨           |        |                      |
| Select image for mask              | PlateTemplate     | $\vee$ | (from NamesAndTypes) |
| Invert the mask?                   | ○ Yes <b>○</b> No |        |                      |
|                                    |                   |        |                      |

# خروجي براي RedPlate:



## خروجی برای CombinedPlate:





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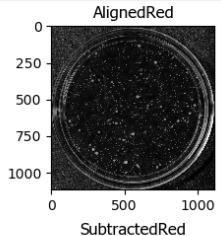
| Operation                             | Subtract                           |
|---------------------------------------|------------------------------------|
| Name the output image                 | SubtractedRed                      |
|                                       |                                    |
| Image or measurement?                 | Image                              |
| Select the first image                | AlignedRed ∨ (from Align #11)      |
| Multiply the first image by           | 1.0                                |
|                                       |                                    |
| Image or measurement?                 |                                    |
| Select the second image               | AlignedCombined ∨ (from Align #11) |
| Multiply the second image by          | 1.0                                |
|                                       |                                    |
|                                       | Add another image                  |
| Raise the power of the result by      | 1.0                                |
| Multiply the result by                |                                    |
|                                       |                                    |
| Add to result                         | 0.0                                |
| Set values less than 0 equal to 0?    | ● Yes ○ No                         |
|                                       |                                    |
| Set values greater than 1 equal to 1? | ○ Yes ○ No                         |
| Replace invalid values with 0?        | • Yes O No                         |
| Ignore the image masks?               | ○ Yes <b>○</b> No                  |
|                                       |                                    |

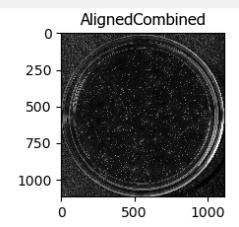
تصویر خروجی:

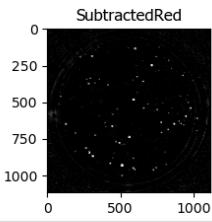


File Subplots Help





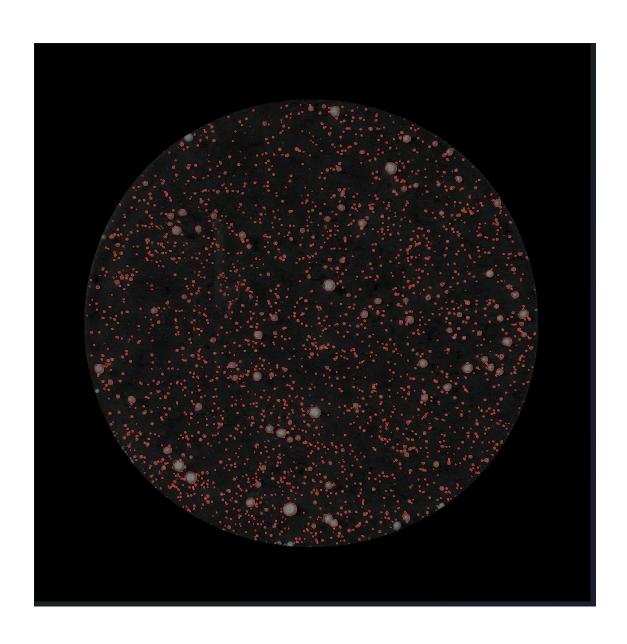




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تصویر خروجی:



دو فایل CSV نیز به همراه تصاویر، در دایرکتوری pipeline\_outputs/. ذخیره شدند.