

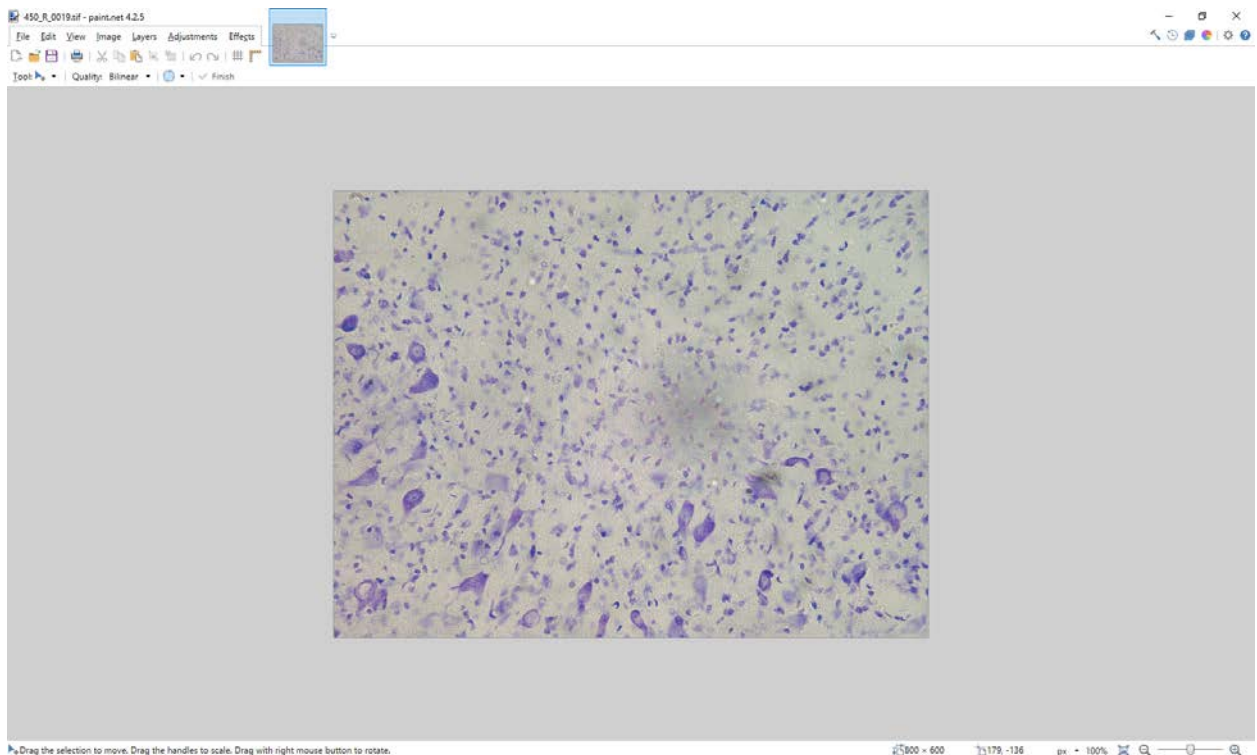
BGR to HSV Converter Instructions

The program BGR_to_HSV.py program, converts the Blue, Green and Red color values found using **paint.net** (available at: <https://www.getpaint.net/>) to Hue, Saturation and Value numbers that can be used by OpenCV applications. (OpenCV available at: <https://opencv.org/>)

OpenCV as per:https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_imgproc/py_colorspaces/py_colorspace_s.html#changing-color-space, has the following HSV ranges "... Hue range is [0,179], Saturation range is [0,255] and Value range is [0,255]..." The HSV ranges for **paint.net** are Hue [0, 360], Saturation [0, 100] and Value [0, 100]. This program attempts to resolve the discrepancy.

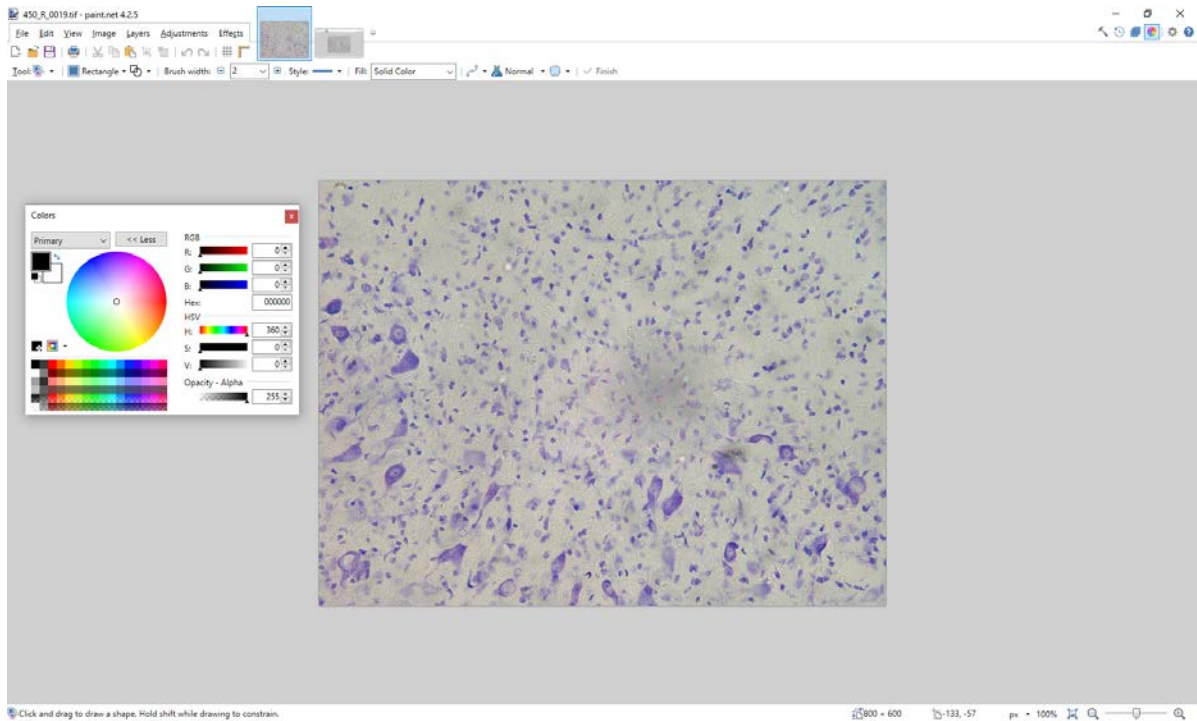
Instructions:

1. Open image in **paint.net**.

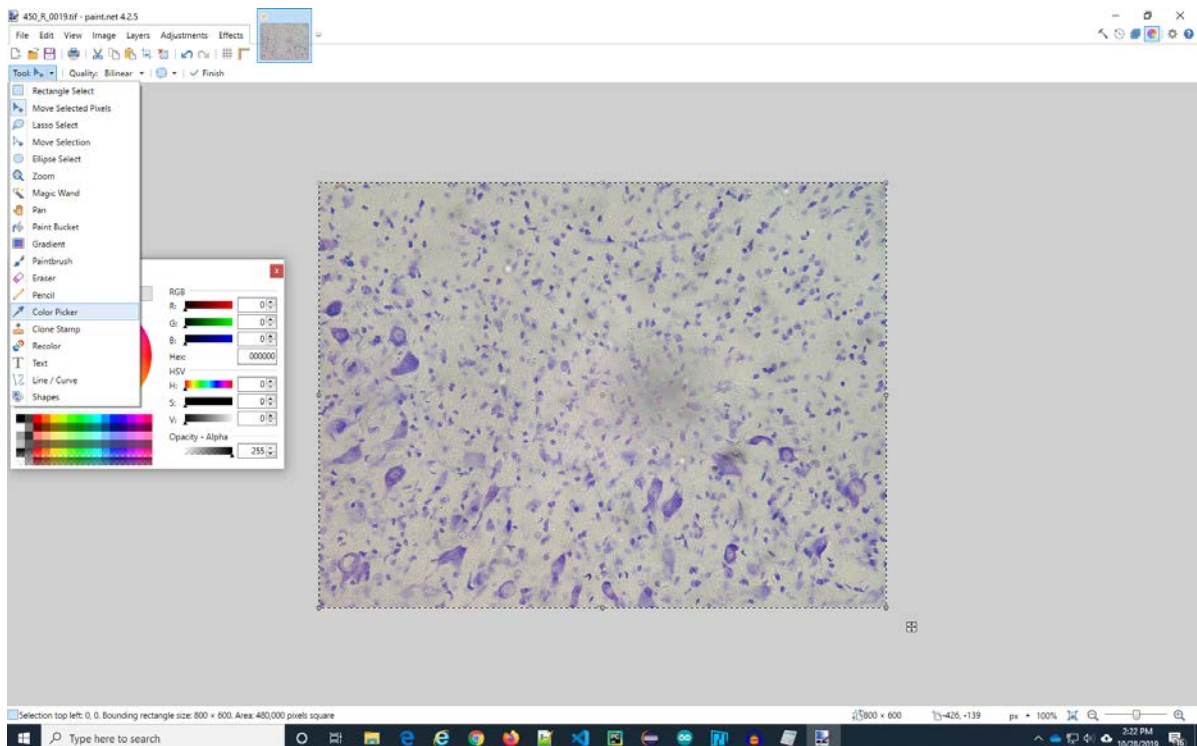


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2. Open **paint.net** colors → Press F8. Press “More >>” in Colors window to display RGB, HSV scales etc.

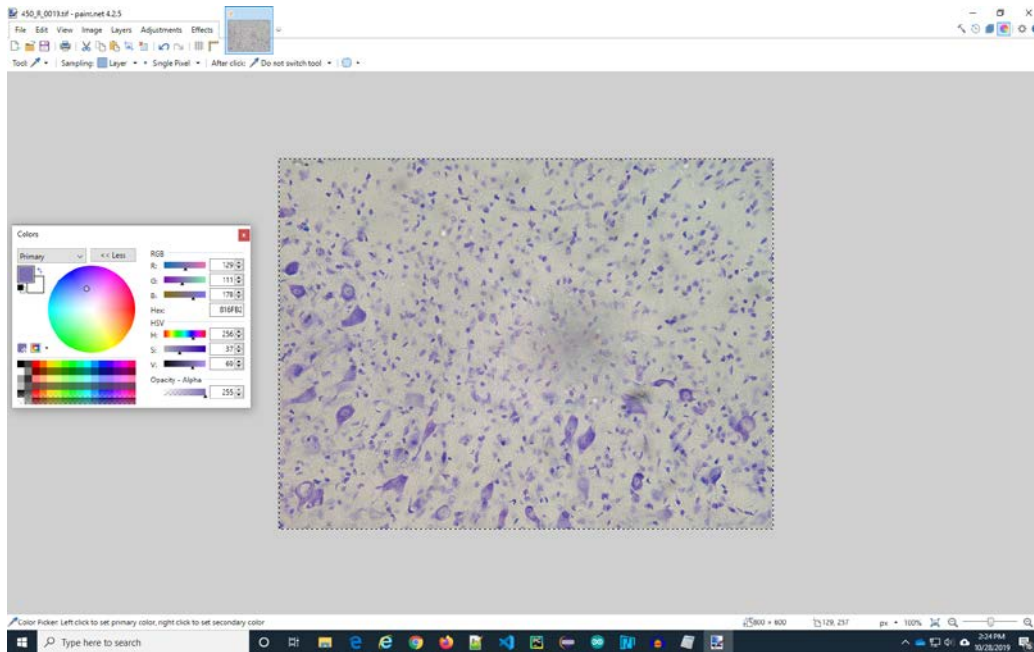


3. Go to Tool → Select “Color Picker”

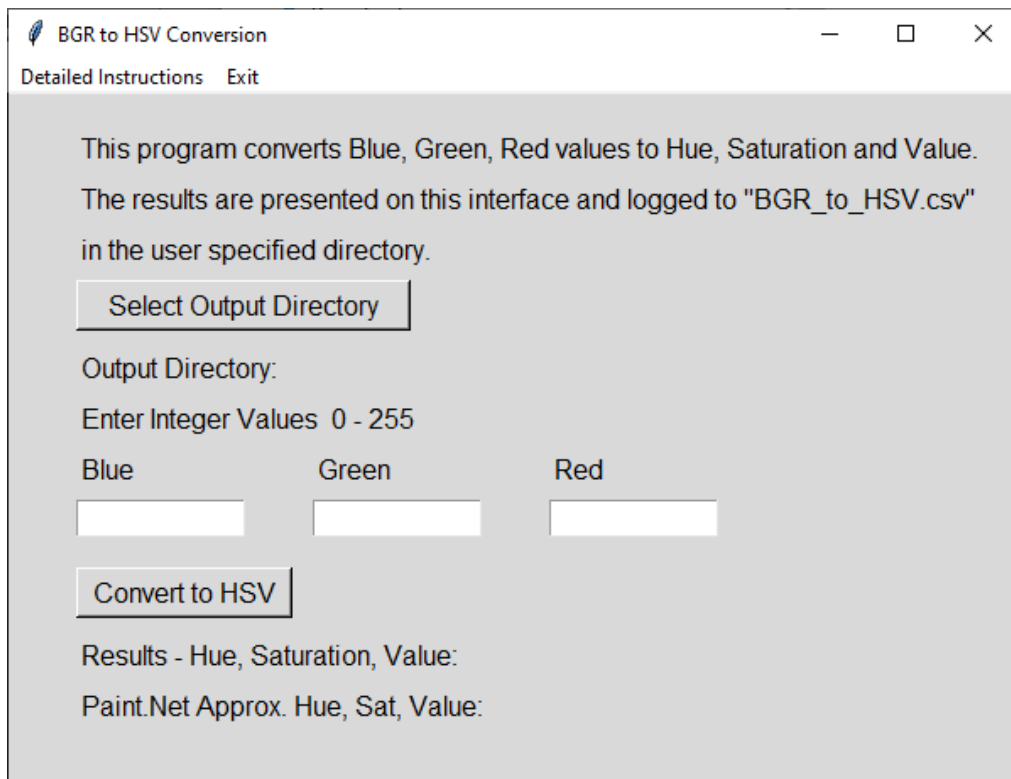


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4. Place color picker over Region of Interest and click mouse. RGB and HSV will update with the color values for that point.

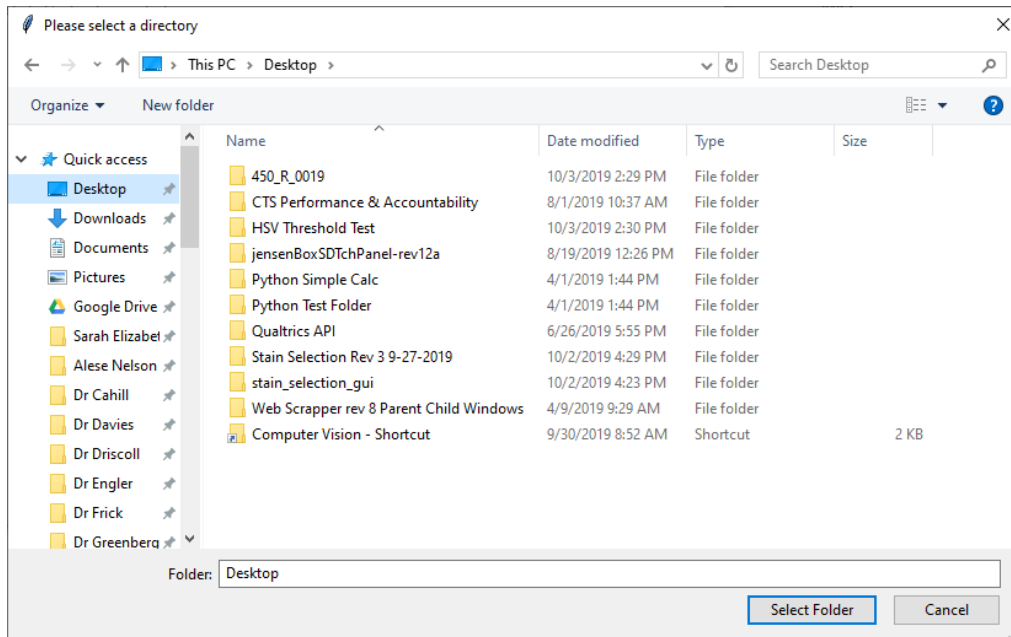


5. Launch "BGR_to_HSV.py" with a double click. (Note: Python 3.7 must be installed on computer.)

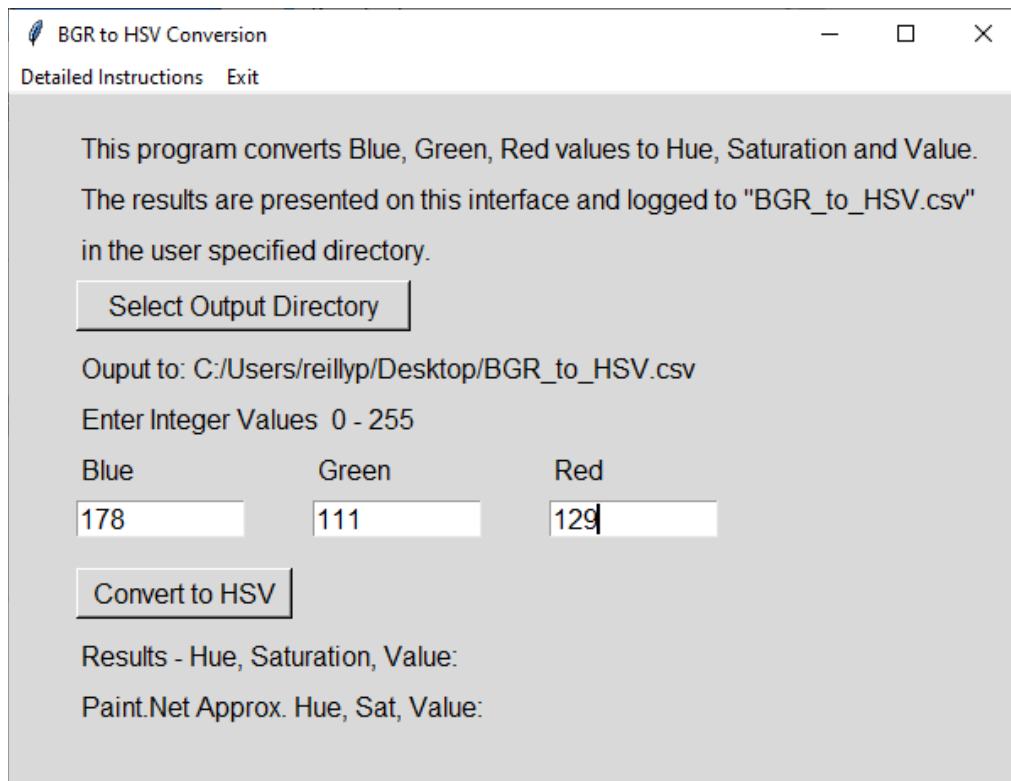


BGR to HSV Convertor Instructions

- Press "Select Output Directory" to select directory for conversion log "BGR_to_HSV.csv".



- Enter values for Blue, Green and Red from paint.net. Press "Convert to HSV" button. (Note: Order is reverse of paint.net values)



BGR to HSV Convertor Instructions

8. Results are displayed on the interface and logged to “BGR_to_HSV.csv”.

The screenshot shows a window titled "BGR to HSV Conversion" with a menu bar containing "Detailed Instructions" and "Exit". The main area contains the following text: "This program converts Blue, Green, Red values to Hue, Saturation and Value. The results are presented on this interface and logged to 'BGR_to_HSV.csv' in the user specified directory." Below this is a button labeled "Select Output Directory". The output path is displayed as "Output to: C:/Users/reillyp/Desktop/BGR_to_HSV.csv". A label "Enter Integer Values 0 - 255" is above three input fields for "Blue", "Green", and "Red". The values entered are 178, 111, and 129 respectively. Below the input fields is a button labeled "Convert to HSV". The results are displayed as "Results - Hue, Saturation, Value: 128, 96, 178" and "Paint.Net Approx. Hue, Sat, Value: 256, 37, 69".

9. The log “BGR_to_HSV.csv” has nine columns.

Blue	Green	Red	Hue	Saturation	Value	~Hue Paint.Net	~Sat Paint.Net	~Val Paint.Net
178	111	129	128	96	178	256	37	69

- Blue, Green and Red – The user entered color values taken from **paint.net**.
 - Hue, Saturation and Value – the converted values that may be used for OpenCV applications.
 - ~Hue Paint.Net, ~Sat Paint. Net, ~ Val Paint.Net – the approximate values for Hue, Saturation and Value displayed by paint.net. Note: there may be minor differences due to integer math rounding error.
10. Repeat process for other regions of interest. Each subsequent conversion is added as a row to “BGR_to_HSV.csv”.