DIP PROJECT
: Reflection Removal of Image

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Question

How can we remove the reflections in images effectively?

Introduction of previous methods

MATLAB Answers

Search Answers

Link

Answer by Image Analyst MVP on 9 Feb 2013

Extract all color channels:

```
% Extract the individual red, green, and blue color channe
ls.
redChannel = rgbImage(:, :, 1);
greenChannel = rgbImage(:, :, 2);
blueChannel = rgbImage(:, :, 3);
```

Find where all channels are bright, say more than 230:

```
thresholdValue = 230;
brightRed = redChannel > thresholdValue;
brightGreen = greenChannel > thresholdValue;
brightBlue = blueChannel > thresholdValue;
```

Find where they are all bright at the same time:

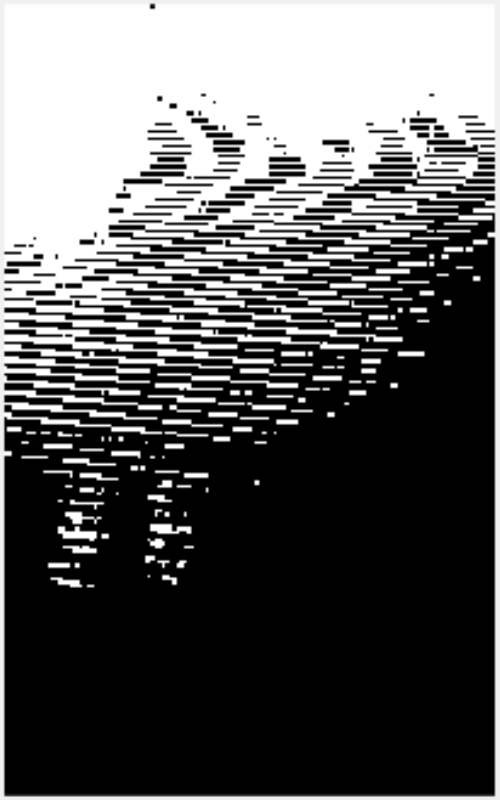
```
whitePixels = brightRed & brightGreen & brightBlue;
```

Then you have a mask image, whitePixels, which you can use to exclude those pixels from being measured. Exact implementation of the mask during your measurements depends on what you are going to do do make the measurements.

- Setting threshold values for each R, G, B
- Extract pixels, which have higher values than threshold

Introduction of previous methods

- Result of previous method



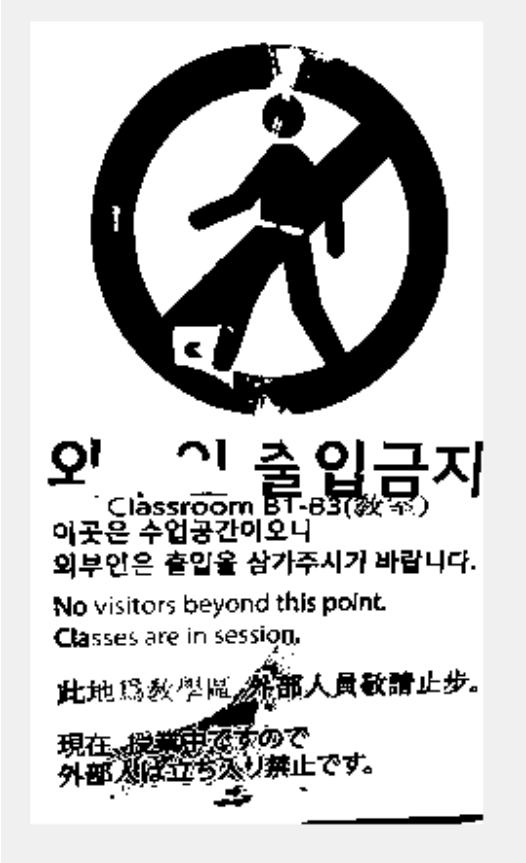
Comparison with proposed method

- Previous method:
  - Setting average value as threshold
- Problem:
  - Elimination of every values below the threshold value.
  - Reflection values are not always lower than average R,G,B values.

- Proposed method:
  - Utilize **histogram of the image** to find appropriate threshold value.
  - Utilize **interpolation method** to find appropriate threshold value.
  - Utilize **histogram equalization** based on R, G, B ratio

Assignment 1 : setting appropriate threshold

Original Image



Threshold=120

Threshold=147

Assignment 2 : image equalization quality

<Histogram equalization without concern of R,G,B ratio>

Steps

Step 1. Reflection and Light Detection

Step 1-1. Light Element Analysis : 3D Histogram analysis

Step 1-2. Light Element Analysis : R, G, B element ratio calculation

Step 1-3. Light Position Detection : Get coordinate of pixel, which has specific ratio

Step 1-4. Light Detection : Get all coordinates of pixels, which has similar ratio range

Step 2. Remove elements, which has detected from previous step

Step 2-1. Light element removal : Calculate R,G,B elements of neighbor pixels of detected area

Step 2-2. Refill light element : Refill detected area with interpolated values from neighbor pixels

수행과정

Step 3. RGB histogram equalization

Step 3-1. : Calculate R,G,B ratio of whole image

Step 3-2. : Optimize the image with calculated R,G,B ratio

Result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Classroom B1-B3(教室)
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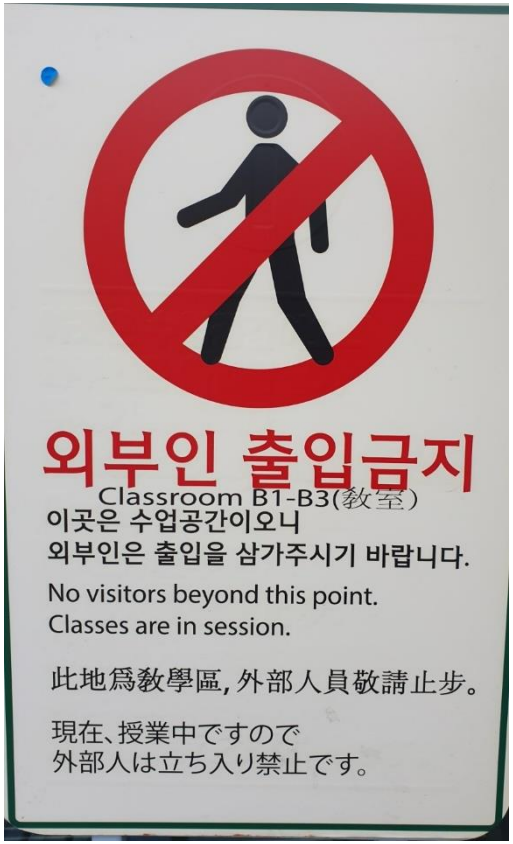
現在、授業中ですので
外部人は立ち入り禁止です。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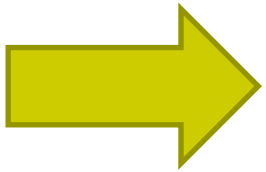
Result



Thank you~!