imread altering image in Matlab?

Asked 11 years ago Modified 10 years, 9 months ago Viewed 2k times

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I am having an issue reading a single image of a stacked tiff in using imread. The tiff is 128-by-126. It reads in just fine with ImageJ, but I try reading it into Matlab for some processing and it creates an odd streak in the center of the image. With the origin of the image in the top left, rows 63 and 64 are repeated as rows 65 and 66, and the last two rows of the image, 125 and 126 are cut off. I can tell this is happening by visual comparison of the image displayed in matlab to the image displayed in ImageJ.

If I take the same tiff stack, and save the first frame in ImageJ, I don't have this issue. Even when displaying the outputted matlab image using ImageJ, I see the same issue. However, I would like to automate the process to save images from several tiff stacks as single tiff files, which I can't do in ImageJ, so I turned to Matlab and ran into this issue. I have included my code below. I tried reading the tiff in two different ways and got the same error. It seems to be related to the tiff stack and how matlab reads in the tiffs. I am using Matlab R2012b.

I have included links below to the static ImageJ image I am seeing and the static matlab image I am seeing. I have also included a link for loading the stacked tiff file that is generating these issues for me.

Note: When I have ImageJ output each frame as an individual tiff and I open the first frame from that output in matlab using the same code below, the image is correctly displayed. The error only occurs when reading in the first frame from the image stack in Matlab.

StackOverflow doesn't support embedding TIFF files, but you can view and download them from these links:

- Stacked Tiff File - Data I am working with
- What the first frame should look like - ImageJ
- What I am seeing when loading the first frame in MATLAB

Code Used to Generate the Image

```
fname='C:\FileLocation\pcd144_012.tif';
im1=imread(fname,1)
imagesc(im1);
axis image; colormap gray;
```

I tried reading in the image as a tiff object to see if it solved the problem and this didn't work either. The image has two strips, and the last two lines of the first strip are the same as the first two lines of the last strip, which is why the middle lines seem to be repeated. It seems matlab is indexing reading my image in wrong, likely because it is not a square image. Am I just doing something wrong, or does matlab have a bug with respect to reading in non-square tiffs? Any ideas or suggestions for improvement?

image matlab tiff

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edited Dec 23, 2013 at 20:23

asked Dec 23, 2013 at 16:31

krhans

107 ● 1 ● 7

Can you provide a link to the TIFF image in question or another that demonstrates the same issue? – horchler Dec 23, 2013 at 17:10

I am not aware of any non-square issue with Tiff/MATLAB. Anychance you could share this file? – Ashish Uthama Dec 23, 2013 at 17:10

1 Are you sure that this due to the image being read incorrectly rather than display artifacts? Have you displayed just the rows/columns in question and printed out their numeric values? Also, can you try software other than ImageJ. – horchler Dec 23, 2013 at 17:28

I have plotted just the numeric values of the last two lines of the first strip, and they are identical to the numeric values of the first two lines of the last strip. I have edited the above with links to the stacked file and examples of what I am seeing. Not certain if the sharing worked, let me know if it doesn't. @horchler – krhans Dec 23, 2013 at 18:16

3 @krhans: The header for this file just doesn't make sense. Use `iminfo` in Matlab to look at the details. The `Width` and `Height` fields say 128 and 126, respectively, but the `StripOffsets` and `StripByteCounts` fields don't seem to match up with this. They seem to imply that the data is actually 128-by-124 (or perhaps something else). This may explain why ImageJ shows different results if it simply grabs the dimensions and goes looking for that many pixels. Matlab may try to do other things using this header information. – horchler Dec 23, 2013 at 21:01

1 Answer

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First of, I kinda agree with horchler, that is, there is something wrong in your header.

We can easily observe that the `StripByteCounts (15872)` does not match `width*height (128*126)`. This could be the reason you see the repetition in row `63 - 64` and `65 - 66`.

Since the `RowPerStrip = 64` and `StripOffsets = [8,15880]` may indicate that you have a `128*124` graph, Matlab perhaps uses last two rows in the first 64 rows to pad the missing rows at the beginning of the rest of the rows. So the total row can be filled up to 126. Well, this is just my guess for how Matlab handles the disagreement between dimension and ByteCounts.

After all, to your question, `imread` indeed alters image in Matlab when reading TIFF without issuing any warning. Bad job in `imread` reading TIFF, Matlab.

After observing your TIFF frames in one of your links, the TIFF seems to actually have image data with dimension `128*126`. So if you trust the dimension indicating in the header, you would probably use fread to read the frames in your TIFF instead of using shaky `imfread`.

```
fname='pcd144_012.tif';
tiffInfo = imfinfo(fname);
framIndex = 1;
tiffWidth = tiffInfo(framIndex).Width; % image width
tiffHeight = tiffInfo(framIndex).Height; % image height
tiffStartOffset = tiffInfo(framIndex).StripOffsets(1); % Image data offset
start point
tiffEndOffset = tiffInfo(framIndex).StripOffsets(2); % Image data offset end
point
fid = fopen(fname);
fseek(fid,tiffStartOffset,'bof');
im1 = fread(fid,tiffWidth*tiffHeight,'*uint16'); % We knew this from
BitsPerSample
fclose(fid);
im1 = reshape(im1,tiffWidth,tiffHeight); % Reshape the image data array
figure
imagesc(im1);
colormap gray;
axis xy;
axis image;
```

Now, while this may solve the weird Matlab `imread` behavior, however, the above result still does not match the picture you showed in your second link. According to the picture in the second link, it has 300 frames but the one you attached in your first link only has 30 frames. Maybe we are all looking at the wrong picture?

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edited Mar 9, 2014 at 14:15

answered Mar 9, 2014 at 6:10

Y. Chang

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