Subject: tif image 16 bit. autolevel
Posted by tojocky on Fri, 29 Apr 2011 06:54:56 GMT
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Hello,

I have a trouble with load 16bit tiff image and set color/contrast auto-level.

Is possible in U++?

Thank you in advance!

Subject: Re: tif image 16 bit. autolevel
Posted by koldo on Fri, 29 Apr 2011 08:12:10 GMT
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Hello Ion

Is it a 16 bits per color image?

What do you mean with set color/contrast auto-level?

Subject: Re: tif image 16 bit. autolevel
Posted by dolik.rce on Fri, 29 Apr 2011 09:02:17 GMT
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tojocky wrote on Fri, 29 April 2011 08:54Hello,

I have a trouble with load 16bit tiff image and set color/contrast auto-level.

Is possible in U++?

Thank you in advance!
Hi Ion,

Unfortunately, U++ doesn't support 16 bit tiffs at the moment, and even libtiff support is quite limited. Have a look at this thread about the same topic, there are some links to sites suggesting how to possibly overcome these limitations...

Best regards,
Honza

Subject: Re: tif image 16 bit. autolevel

Posted by tojocky on Fri, 29 Apr 2011 09:28:29 GMT
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koldo wrote on Fri, 29 April 2011 11:12Hello Ion

Is it a 16 bits per color image?

What do you mean with set color/contrast auto-level?

In Photoshop Exists possibility to change color/contrast level.

Thank you for quick response!

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Fri, 29 Apr 2011 09:35:35 GMT
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dolik.rce wrote on Fri, 29 April 2011 12:02tojocky wrote on Fri, 29 April 2011 08:54Hello,

I have a trouble with load 16bit tiff image and set color/contrast auto-level.

Is possible in U++?

Thank you in advance!
Hi Ion,

Unfortunately, U++ doesn't support 16 bit tiffs at the moment, and even libtiff support is quite limited. Have a look at this thread about the same topic, there are some links to sites suggesting how to possibly overcome these limitations...

Best regards,
Honza
Thank you for hint.

I tried to open the tif image in U++. it opened OK, but on I tried to change contrast with the method:

Image Contrast(const Image& img, int amount)

but the contrast was not so good.

Any hint are welcome!

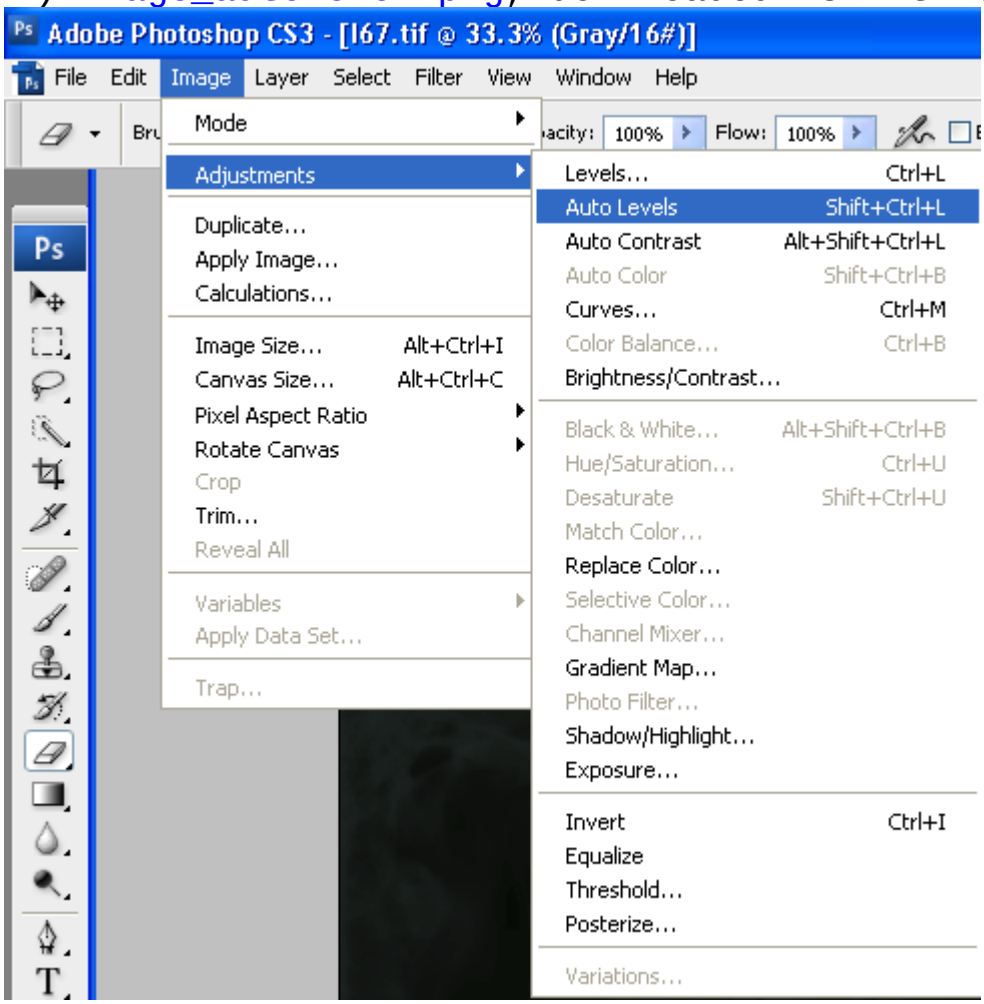
Thank you for quick response!

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Fri, 29 Apr 2011 09:52:06 GMT
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and a screenshot:

## File Attachments

1) image_autolevel.png, downloaded 1344 times




Subject: Re: tif image 16 bit. autolevel
Posted by mirek on Fri, 29 Apr 2011 18:13:14 GMT
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tojocky wrote on Fri, 29 April 2011 02:54
I have a trouble with load 16bit tiff image and set color/contrast auto-level.

There is no routine for that at the moment.

Should not be hard to do I think... but one would have to be sure about algorithm I guess.

Mirek

---

Subject: Re: tif image 16 bit. autolevel
Posted by koldo on Sat, 30 Apr 2011 07:33:22 GMT
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Hello Ion

In summary you can open the image right and set it in an Image. This is very good .

About the algorithm I agree with Mirek. I have searched about Photoshop algorithm unsuccessfully, but it seems they change the contrast by spreading the color histogram by all the range. There is more than one way to do it.

Please send here a sample of an image before and after that effect and we can try to give you the function.

---

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Sat, 30 Apr 2011 16:07:11 GMT
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koldo wrote on Sat, 30 April 2011 10:33Hello Ion

In summary you can open the image right and set it in an Image. This is very good .

About the algorithm I agree with Mirek. I have searched about Photoshop algorithm unsuccessfully, but it seems they change the contrast by spreading the color histogram by all the range. There is more than one way to do it.

Please send here a sample of an image before and after that effect and we can try to give you the function.

Thank you Koldo for help.

I will try to find a solution too!

I have attached a simple image in tif 16bits before and after autolevel.

## File Attachments

1) image16bits.tif, downloaded 567 times

2) image16bits_after_autolevel.tif, downloaded 540 times

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Sat, 30 Apr 2011 16:21:36 GMT
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May be interesting article with simple code how to get HSL.
http://www.codeproject.com/KB/GDI-plus/HSLColorSpace.aspx?ms g=917339

Subject: Re: tif image 16 bit. autolevel
Posted by koldo on Sun, 01 May 2011 13:50:06 GMT
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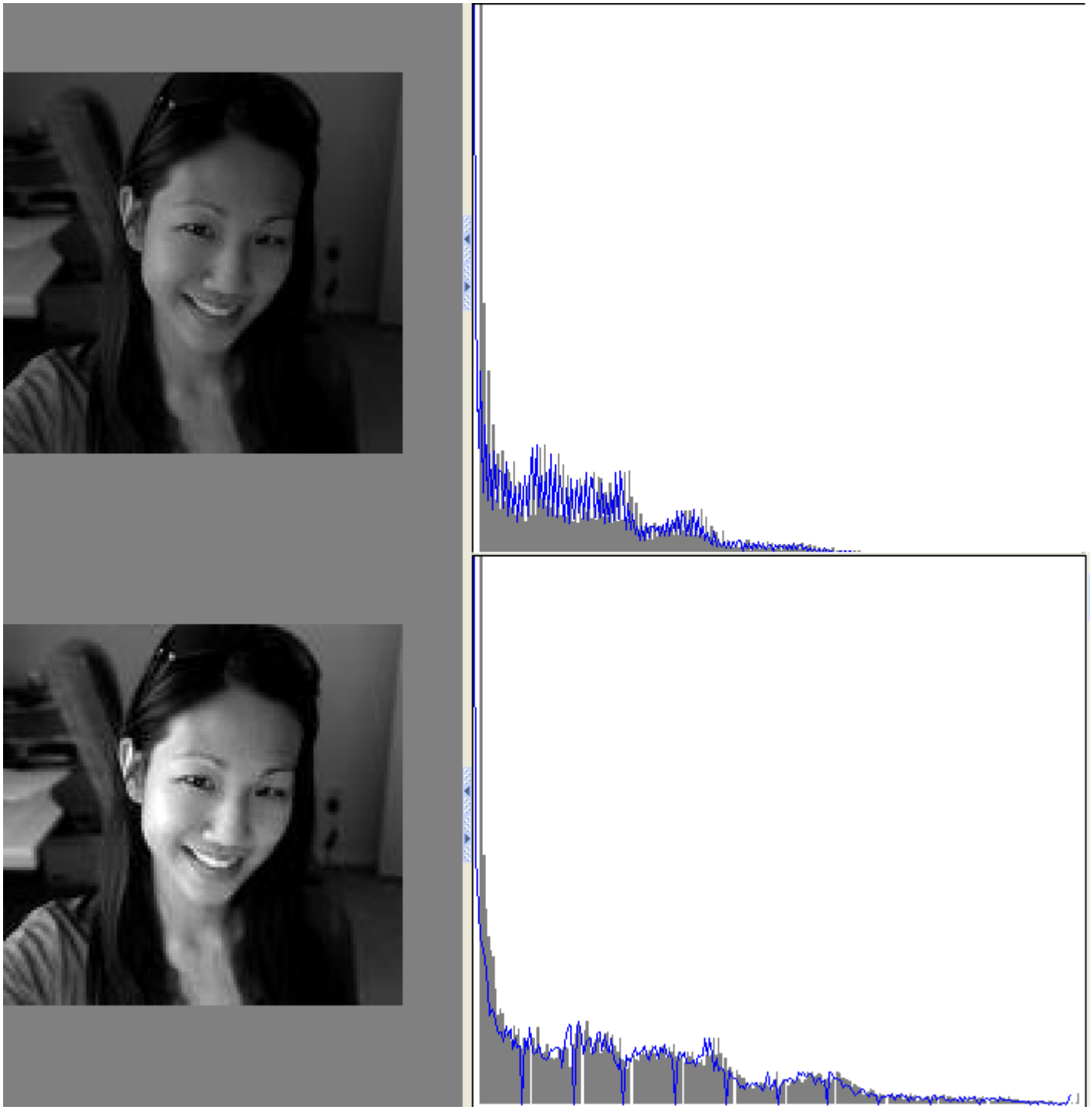
Hello Ion

Here are the images and their histograms. You see the second one more extended along the color range.

If you can wait a couple of days I can prepare something.

Ah, your girlfriend is very pretty .

File Attachments
1) image.png, downloaded 1277 times



Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Mon, 02 May 2011 07:30:57 GMT
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koldo wrote on Sun, 01 May 2011 16:50Hello Ion

Here are the images and their histograms. You see the second one more extended along the

color range.

If you can wait a couple of days I can prepare something.

Ah, your girlfriend is very pretty .

Koldo,

It is exact What I need.
Can you share with code?

P.S. This is not my girlfriend. I'm married and you can see more photos by address:
https://picasaweb.google.com/ionlupascu

---

Subject: Re: tif image 16 bit. autolevel
Posted by koldo on Mon, 02 May 2011 08:17:05 GMT
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A handsome couple!

---

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Mon, 02 May 2011 08:30:32 GMT
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koldo wrote on Mon, 02 May 2011 11:17A handsome couple!

Thank you!

---

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Mon, 02 May 2011 10:03:20 GMT
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OK, Now I'm able to print the histogram!

before autolevel:

and after autolevel:

and the algorithm:

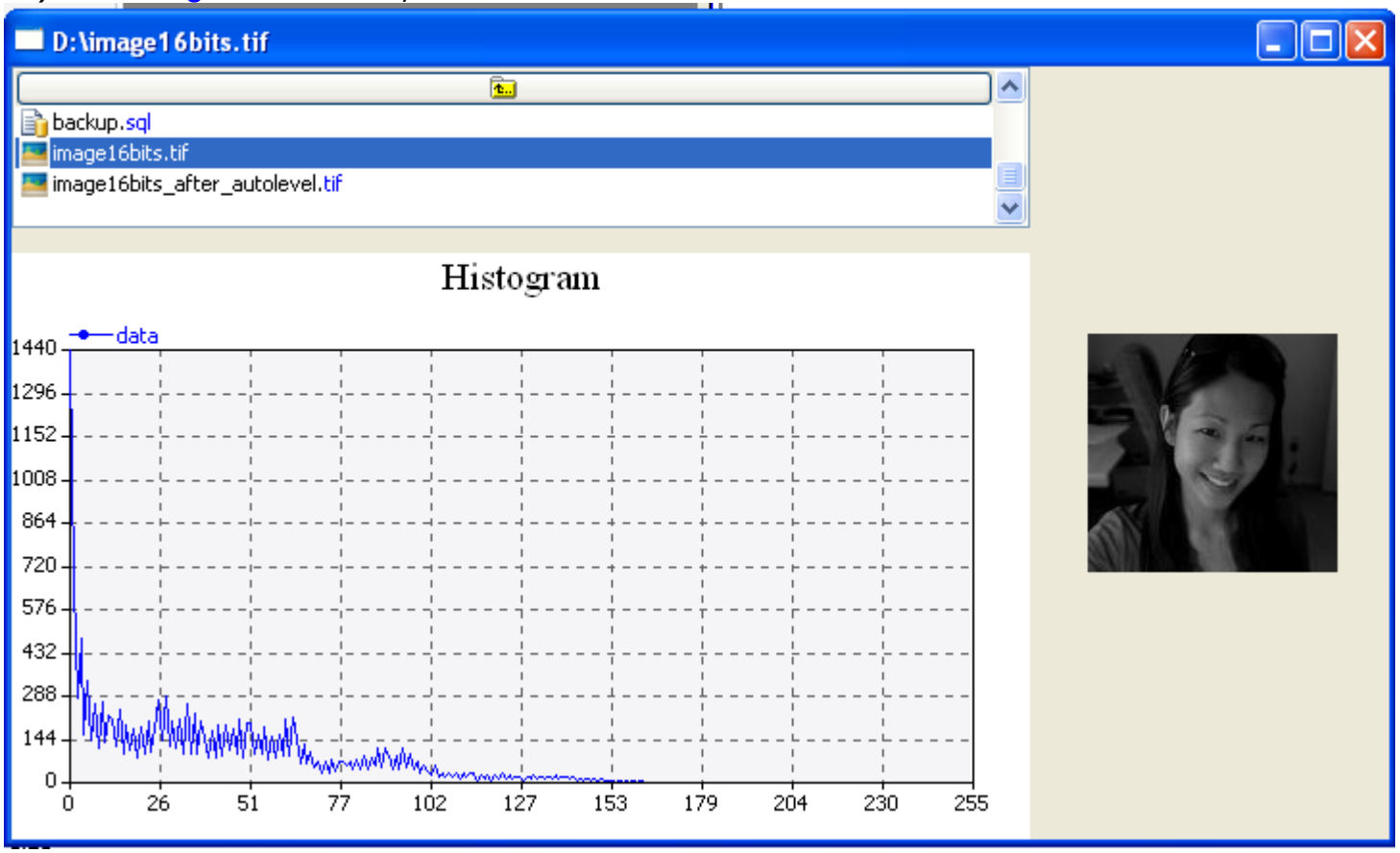
```
Vector<XY> hist_data;
for(int i=0;i<256;++i)
 hist_data << XY(i, 0);

const RGBA *s = ~img;
const RGBA *e = s + img.GetLength();
while(s < e) {
 v_curr_value = (s->r+s->g+s->b)/3;
 hist_data[v_curr_value].y++;
 if(hist_data[v_curr_value].y>v_max_y)
  v_max_y = hist_data[v_curr_value].y;
 s++;
}
```

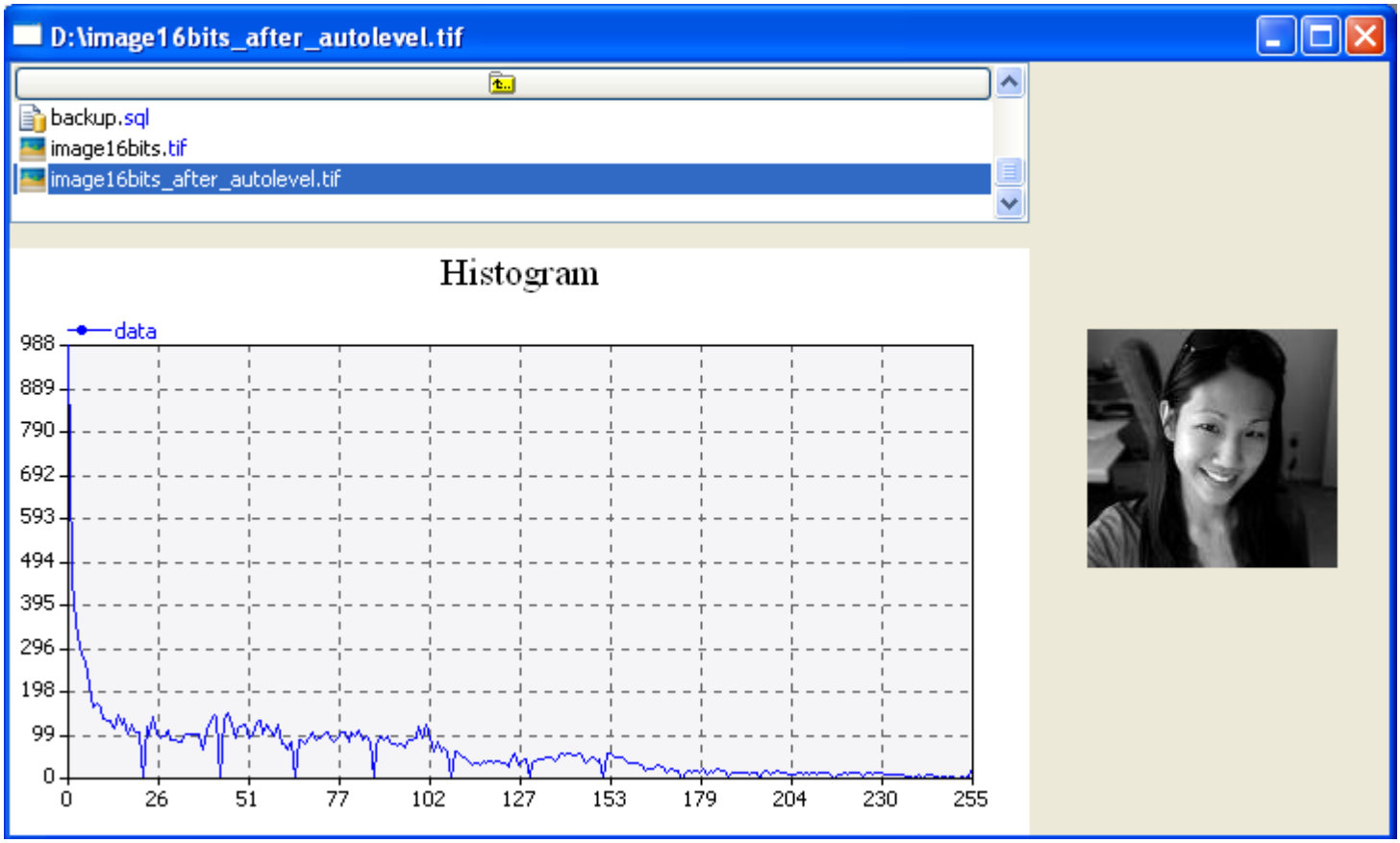
The easy way remain how to compute the autolevel algorithm in base of histogram!

## File Attachments

1) histogram_1.PNG, downloaded 1287 times




2) histogram_2.PNG, downloaded 1241 times




Subject: Re: tif image 16 bit. autolevel
Posted by koldo on Mon, 02 May 2011 12:02:27 GMT
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Hello Ion

In your case to pass from one histogram to the other is as easy as multiplying any pixel by a factor.

In a more complex scenario you should have to set a window of your histogram and determine which function to apply, like:

New color = F(Old color)

Remember to use function int Grayscale(const Color& c). The conversion to gray is more adequate .

PD. The second histogram strange zeros seem to indicate that there is a problem in the conversion program.

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Mon, 02 May 2011 14:21:21 GMT
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I thing this is what I look for:
http://en.wikipedia.org/wiki/Histogram_equalisation
I did a variant of autolevel, but I intend to modify by wikipedia specification.

```
Image ImageAutolevel(const Image& img){
 uint64 histogram[256];
 for(int i=0;i<256;++i)
  histogram[i]=0;

 const RGBA *start = img;
 const RGBA *s = start;
 const RGBA *e = s + img.GetLength();
 while(s < e){
  histogram[(s->r+s->g+s->b)/3]++;
  s++;
 }
 int v_lower = -1;
 int v_upper = -1;

 for(int i=0;i<256&&(v_lower==-1||v_upper==-1);++i){
  if(v_lower==-1&&histogram[i]!=0)
   v_lower = i;
  if(v_upper==-1&&histogram[255-i]!=0)
   v_upper = 255-i;
 }

 // return if not sense to autolevel
 //if(v_lower==v_upper==-1)

 if(v_lower==-1)
  v_lower = 0;

 if(v_upper==-1)
  v_upper = 255;

 s = start;
 ImageBuffer w(img.GetSize());
 Unmultiply(w);
 RGBA *t = w;

 while(s < e) {
  t->r = s->r*255/v_upper;
  t->g = s->g*255/v_upper;
  t->b = s->b*255/v_upper;
  t->a = s->a;
```

```
  t++;
  s++;
 }
 Premultiply(w);
 w.SetHotSpots(img);
 return w;
}
```

---

Subject: Re: tif image 16 bit. autolevel
Posted by koldo on Mon, 02 May 2011 15:37:16 GMT
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Hello Ion

Your code is right, although consider this fragment:

It is better to convert your original image from RGB to HSV, apply the algorithm to the Luminance component and convert the result to RGB.

In U++ we have the functions RGBtoHSV() and HSVtoRGB().

## File Attachments

1) pan.PNG, downloaded 1273 times

### Histogram equalization of color images [edit]

The above describes histogram equalization on a grayscale image. However it can also be used on color images by applying the same method separately to the Red, Green and Blue components of the RGB color values of the image. However, applying the same method on the Red, Green, and Blue components of an RGB image may yield dramatic changes in the image's color balance since the relative distributions of the color channels change as a result of applying the algorithm. However, if the image is first converted to another color space, Lab color space, or HSL/HSV color space in particular, then the algorithm can be applied to the luminance or value channel without resulting in changes to the hue and saturation of the image.

---

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Thu, 05 May 2011 18:10:44 GMT
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koldo wrote on Mon, 02 May 2011 18:37Hello Ion

Your code is right, although consider this fragment:

It is better to convert your original image from RGB to HSV, apply the algorithm to the Luminance component and convert the result to RGB.

In U++ we have the functions RGBtoHSV() and HSVtoRGB().

Thank you Koldo! I will!

---

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Thu, 05 May 2011 18:15:56 GMT
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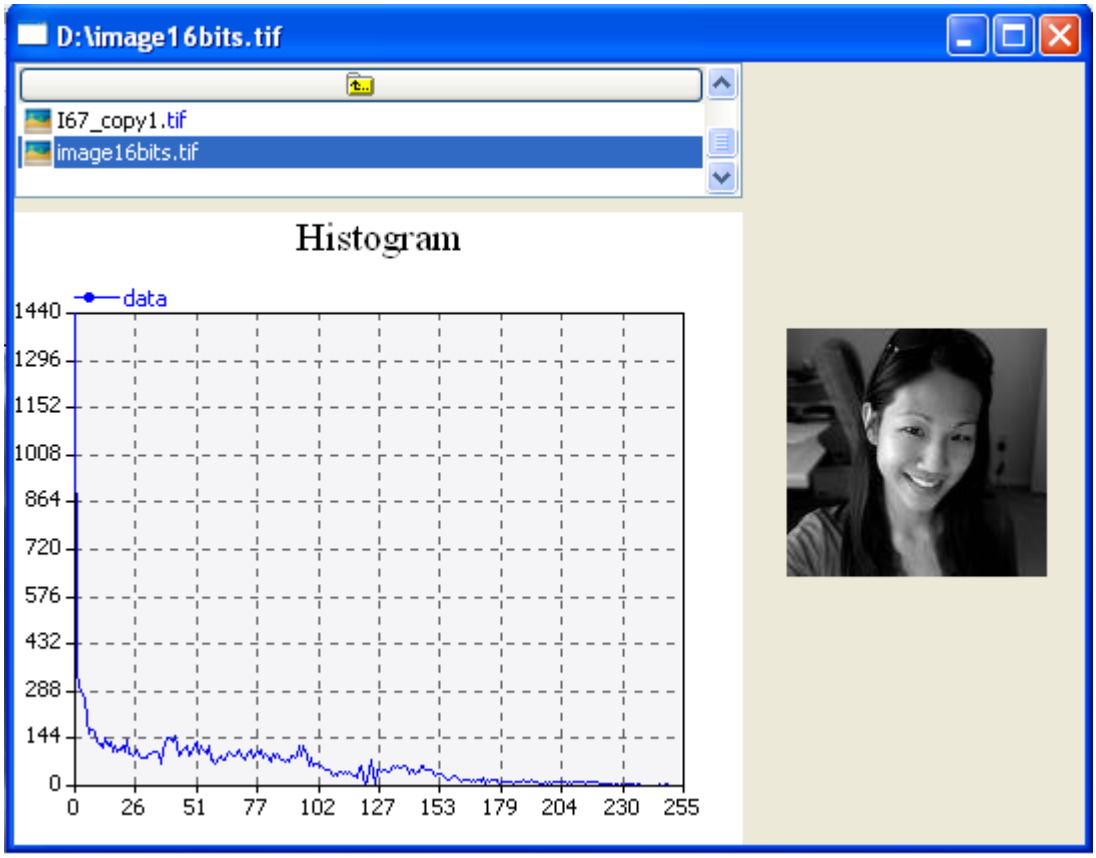
I finally get the wanted result! Was able to read true 16bit tiff image, set autolevel and after that converted in 8bit Image.

The result is like in Photoshop.

It seems that equalization and autolevel a 2 different algorithms.

If somebody want, I can share the code!

File Attachments
1) final_autolevel.PNG, downloaded 1232 times




Subject: Re: tif image 16 bit. autolevel
Posted by koldo on Thu, 05 May 2011 19:28:59 GMT
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Quote:If somebody want, I can share the code!Hello Ion

If there is no other place yet it would be great to put it in Functions4U .

Subject: Re: tif image 16 bit. autolevel
Posted by tojocky on Fri, 06 May 2011 11:25:24 GMT
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koldo wrote on Thu, 05 May 2011 22:28Quote:If somebody want, I can share the code!Hello Ion

If there is no other place yet it would be great to put it in Functions4U .

Koldo,

I have attached the package where I made testes.

This is not the final version. I did not made autolevel for color images.

I can prepare and attach the final version.

If you want to test this, do not forget to set tif version which I uploaded to:
http://www.ultimatepp.org/forum/index.php?t=msg&th=6004& amp;start=0&

## File Attachments

1) ImageView_Autolevel.zip, downloaded 430 times