Subject: Plot scatter points with transparency
Posted by chengyuxi34 on Fri, 14 Jul 2017 22:00:27 GMT
View Forum Message <> Reply to Message

Is there a way to do transparent scatter plots? (Usually I use cgScatter2D.pro to do scatter plots)

I need to overlay a large number of scatter points in one plot, which consist of several groups. I want to assign different groups with different colors. The problems is they just tend to block each other due to the large number. Is a way to plot them with transparency or any other good solution?

Thanks,
Chengyu

Subject: Re: Plot scatter points with transparency
Posted by Nikola on Sat, 15 Jul 2017 16:24:08 GMT
View Forum Message <> Reply to Message

On Friday, July 14, 2017 at 11:00:31 PM UTC+1, ChengYu Xi wrote:
> Is there a way to do transparent scatter plots? (Usually I use cgScatter2D.pro to do scatter plots)
>
> I need to overlay a large number of scatter points in one plot, which consist of several groups. I want to assign different groups with different colors. The problems is they just tend to block each other due to the large number. Is a way to plot them with transparency or any other good solution?
>
> Thanks,
> Chengyu

A nice solution is to replace the central dense (all-black) cloud of points with a contour. An example is Fig.7 of
http://iopscience.iop.org/article/10.1086/590237/pdf

To make it, plot the contours of the 2D distribution/histogram, extract the data of the plotted contours using keywords path_xy = path_xy and /path_data_coords and then over-plot only those points that are out of the outermost contour line. I have a routine to do it, but I should prepare it a bit for sharing.

Subject: Re: Plot scatter points with transparency
Posted by Med Bennett on Mon, 17 Jul 2017 05:14:38 GMT
View Forum Message <> Reply to Message

On Friday, July 14, 2017 at 4:00:31 PM UTC-6, ChengYu Xi wrote:
> Is there a way to do transparent scatter plots? (Usually I use cgScatter2D.pro to do scatter plots)

>
> I need to overlay a large number of scatter points in one plot, which consist of several groups. I want to assign different groups with different colors. The problems is they just tend to block each other due to the large number. Is a way to plot them with transparency or any other good solution?
>
> Thanks,
> Chengyu

Another solution might be to subset your data - i.e., if you have thousands of points per group, you might just plot every tenth one or whatever works for your data set.

Subject: Re: Plot scatter points with transparency
Posted by Markus Schmassmann on Mon, 17 Jul 2017 10:56:49 GMT
View Forum Message <> Reply to Message

On 07/15/2017 12:00 AM, chengyuxi34@gmail.com wrote:
> Is there a way to do transparent scatter plots?
> (Usually I use cgScatter2D.pro to do scatter plots)
>
> I need to overlay a large number of scatter points in one plot,
> which consist of several groups. I want to assign different groups
> with different colors. The problems is they just tend to block
> each other due to the large number. Is a way to plot them with
> transparency or any other good solution?
One approach is to edit the ps/epd/pdf or whatever file produced to make the points transparent (don't ask me how...)

Another, randomize the order in which you make the plots, instead of plotting one group after the other.

With the SCATTERPLOT function you can do it with

```
n=n_elements(x)
s=sort(randomu(seed,n))
 s1=scatterplot(x[s],y[s],symbol='.',magnitude=whichGroup[s], rgb_table=myColors)
```

with cgScatter2D my guess is

```
cgScatter2D, x[s], y[s], color=group_colors[whichGroup[s]]
```

should work too.

Another approach is making a 2d histogram for each group, and then using the result as index into a color table (maybe with a log in between).
Then you can use some kind of color mixing to calculate the final color.

```
w1=where(whichGroup eq 1)
 h1=hist_2d(x[w1],y[w1],min1=0.,min2=0.,max1=1.,max2=1.,bin1= .1,bin2=.1)
...
```

That is more complicated than the other approaches, but the result is likely to be clearer. You might want to increase the resolution of the 2d histogram to match the number of pixels in your output.

I hope one of the approaches described is helpful to you, good luck.

Markus

Subject: Re: Plot scatter points with transparency
Posted by dg86 on Tue, 18 Jul 2017 01:56:31 GMT
View Forum Message <> Reply to Message

On Friday, July 14, 2017 at 6:00:31 PM UTC-4, ChengYu Xi wrote:
> Is there a way to do transparent scatter plots? (Usually I use cgScatter2D.pro to do scatter plots)
>
> I need to overlay a large number of scatter points in one plot, which consist of several groups. I want to assign different groups with different colors. The problems is they just tend to block each other due to the large number. Is a way to plot them with transparency or any other good solution?
>
> Thanks,
> Chengyu

The plot() function does exactly what you want. Here's a sketch of what you might want to do:

```
colors = bytarr(n_elements(x))
p = plot(x, y, linestyle='', symbol='o', $
        /sym_filled, transparency=50, rgb_table=34, vert_colors=colors)
```

Your data points are stored in x and y. The linestyle and symbol options plot the data as circles that are not connected by lines. The flag /sym_filled fills the circles. You'll want to choose (or create) a color table. rgb_table=34 is a rainbow table. The vert_colors is an array of indexes into the color table, one for each point in the plot. You'll have to figure out what the indexes should be for your data. Finally, transparency=50 sets each plot symbol to 50% transparency. You'll want to adjust this number to get the effect you want.

There are lots of other options, and I recommend reading the documentation for the plot() function.

For what it's worth, the built-in function graphics routines are quite good for making publication-quality plots.

All the best,

David