

# 1 axgrid.m

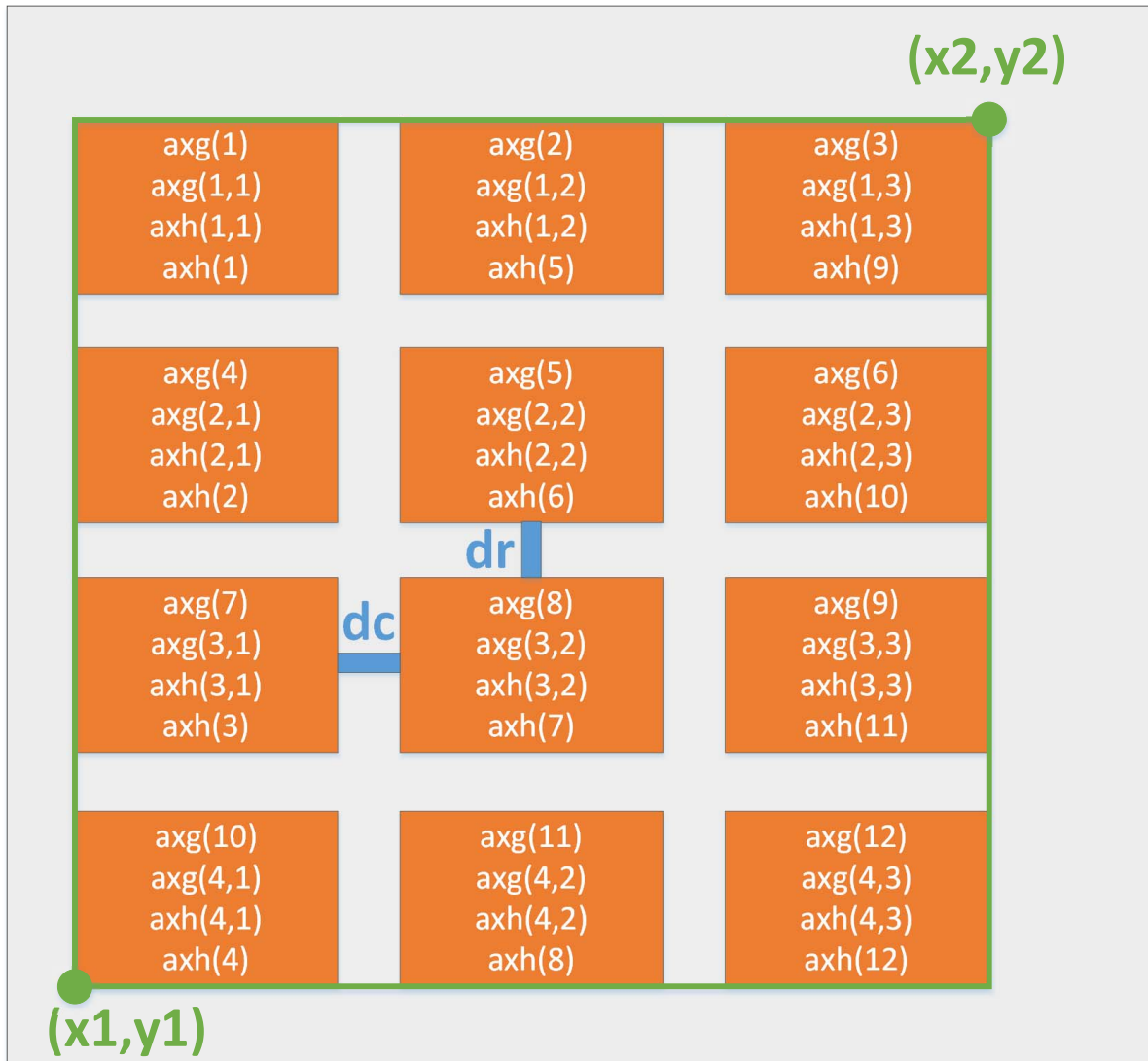
```
1 function [axg,axh] = axgrid(nr,nc,dr,dc,y1,y2,x1,x2)
2 % AXGRID generates more flexibility for generating subplot axes
3 % This function helps with making subplots by allowing the user to edit
4 % various parameters for the spacing and positioning of each axes. axg
5 % is a function handle which is used to generate a subplot, or return an
6 % axes handle to an existing subplot.
7 %
8 % Inputs:
9 %   - ny : Number of Rows
10 %   - nx : Number of Columns
11 %   - dy : Space Between Rows
12 %   - dx : Space Between Columns
13 %   - y1 : Row Starting Coordinate (Bottom)   Default = 0.05
14 %   - y2 : Row Ending Coordinate (Top)        Default = 0.05
15 %   - x1 : Column Starting Coordinate (Left)   Default = 0.05
16 %   - x2 : Column Ending Coordinate (Right)    Default = 0.05
17 %
18 % Outputs:
19 %   - axg : pass in (r,c) or (ind) and returns a handle to that axes
20 %   - axh : matrix of numerical axes handles (each axes auto-generated)
21 %
22 % *axg by default will delete axes it overlaps with, OR will just return
23 % the axes handle if the exact axes exists. If you want to overlay an
24 % axes on another axes, say for a different colormap, call axg with the
25 % optional dooverlay parameter: (r,c,dooverlay) or axg(ind,dooverlay)
```

## 1.1 Motivation/Concept

This function is used for more control on the spacing of subplots.

## 1.2 Math

The input parameters determine the number and spacing of the subplots, as shown below:



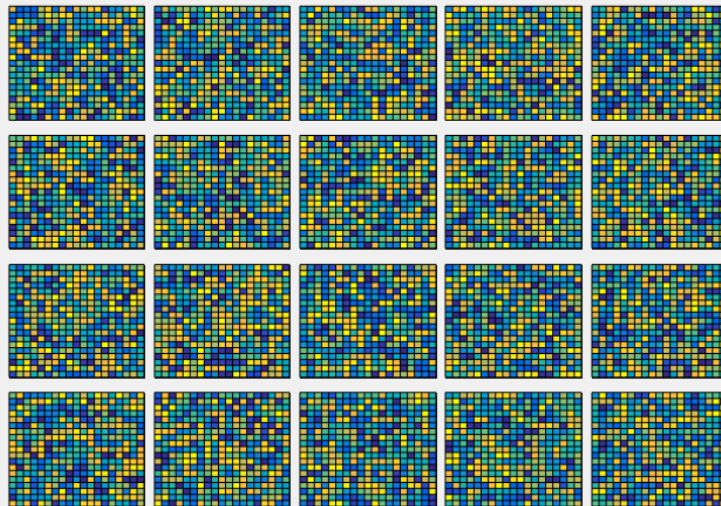
`nc = 3`

`nr = 4`

## Example Usage (*exampleAxgrid.m*)

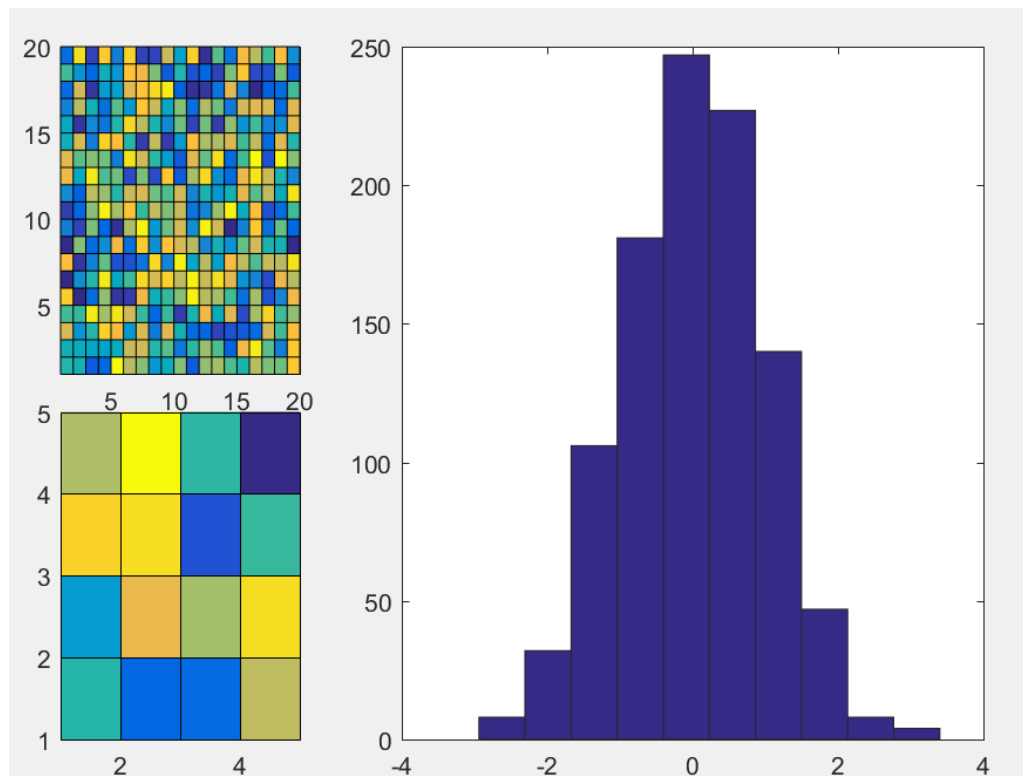
### Basic Preallocated Grid

```
1 %% example axgrid with basic 3x2 grid
2 f1 = figure(1);
3 clf
4 NROWS = 4;dROW = 0.02;
5 NCOLS = 5;dCOL = 0.01;
6 [axg,axh] = axgrid(NROWS,NCOLS,dROW,dCOL,0.05,0.7,0.1,0.8);
7 for r=1:NROWS
8     for c=1:NCOLS
9         axg(r,c);pcolor(rand(20));
10        set(gca,'xtick','');set(gca,'ytick','');
11    end
12 end
```



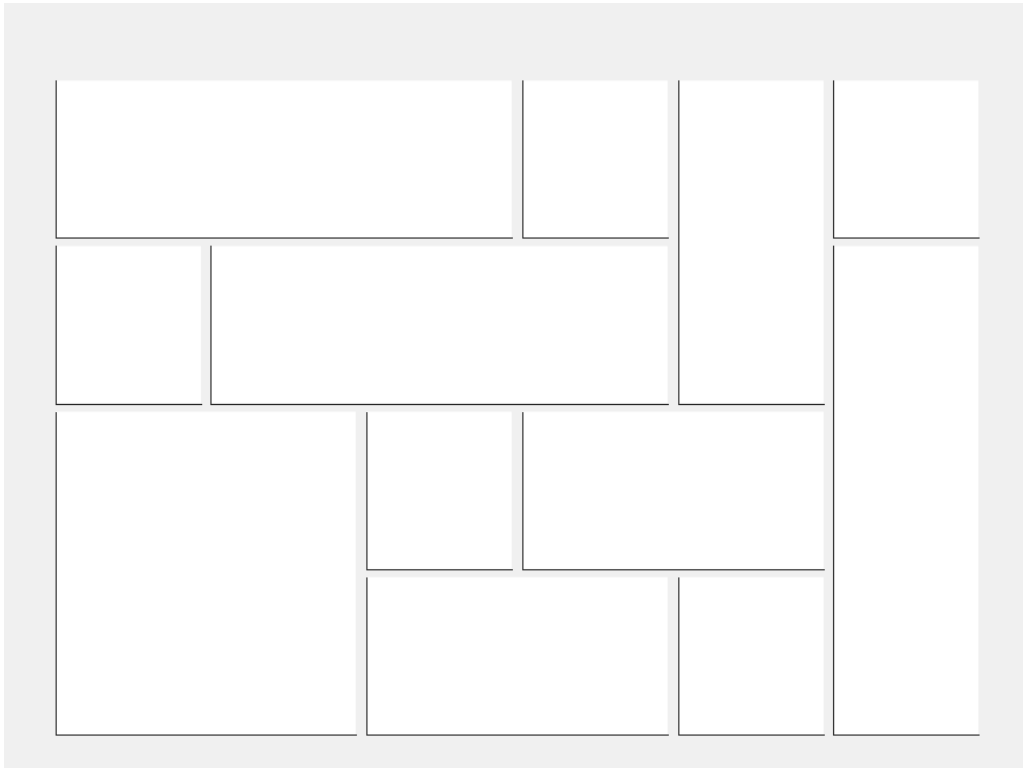
Subplots use more than one grid cell

```
15
16 %% example axgrid basic case
17 f2 = figure(2);clf
18 axg = axgrid(2,3,0.05,0.1);
19 axg(1);pcolor(rand(20));
20 axg(2,1);pcolor(rand(5));
```



## Lots of subplots

```
24
25 %% get crazy with it
26 f3 = figure(3);
27 axg = axgrid(4,6,0.01,0.01,0.05,0.9,0.05,0.95);
28 h(1) = axg([1 1],[1 3]);
29 h(2) = axg([2 2],[2 4]);
30 h(3) = axg([1 2],[5 5]);
31 h(4) = axg([2 4],[6 6]);
32 h(5) = axg(4);
33 h(6) = axg(6);
34 h(7) = axg(7);
35 h(8) = axg([3 4],[1 2]);
36 h(9) = axg(3,3);
37 h(10) = axg([4 4],[3 4]);
38 h(11) = axg(4,5);
39 h(12) = axg([3 3],[4 5]);
```



## Overlapping Subplots

You can get creative and overlap multiple subplots, making the top ones axes background invisible, and give each axes a different colormap.

```
43
44 %% Overlay Two axes so you can do two colormaps
45 f4 = figure(4);clf
46 axg = axgrid(3,3,0.05,0.2,0.2,0.9,0.1,0.9);
47
48 h1 = axg([1 3],[1 2]);
49 pcolor(peaks(100));shading flat
50 c2a = colorbar('location','manual','position',...
51     [h1.Position(1)+h1.Position(3)+0.05 h1.Position(2) 0.1 h1.Position(4)]);
52 colormap('gray');
53
54 h2a = axg(1,3);
55 h2b = axg(2,3);
56 h2c = axg(3,3);
57
58 h1b = axg([1 3],[1 2],true);
59 scatter(rand(100,1)*100,rand(100,1)*100,50,randn(100,1),'filled');
60 c2b = colorbar('location','south','position',...
61     [h1.Position(1) h1.Position(2)-0.15 h1.Position(3) 0.1]);
62 set(h1b,'visible','off')
63 colormap(h1b,'jet')
64 linkaxes([h1 h1b],'xy')
65 xlim([1 100]);ylim([1 100])
```

