Cluster Weight Matrices

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```
In [21]: import Cluster as C
         import RTRL as network
         import NetworkIOStreams as nio
         import dimensions_kit as dk
         import matplotlib.pyplot as plt
         from mpl_toolkits.axes_grid1 import make_axes_locatable
         import scipy.cluster.hierarchy as sch
         numNets = 1000
         nNodes = 6
         net = network.RTRLNetwork;
```

```
In [18]: def plot_solutions(weight_solutions):

               dims = dk.dimensions(len(weight_solutions))
               print dims
               f, axes = plt.subplots(*dims,figsize=(10,10))
               for s in range(len(weight_solutions)):
                    sol = weight_solutions[s]
                    x, y= dk.transform(dims, s)
                    axis = axes[x][y]
                    pc = axis.pcolormesh(sol)

                    div = make_axes_locatable(axis)
                    cax = div.append_axes("right", size="5%", pad=0.01)
                    cbar = plt.colorbar(pc, cax=cax)

               i = len(weight_solutions)
               while i < dims[0]*dims[1]:
                    x,y = dk.transform(dims,i )
                    axes[x][y].axis('off')
                    i+=1
               f.tight_layout()
               return f
```

```
In [6]: def new_aggregator(p):

            """
            p is a 4-vector containing at its indices:
            0 - number of nodes for the aggregator
            2 - delay for the network input
            3 - eta learning rate
            4 - number of iterations to train the network for
            """
            NODES = 0
```

```
        DELAY = 1
        ETA = 2
        ITER = 3

        nnodes = p[NODES]
        delay = p[DELAY]
        eta = p[ETA]
        niterations = p[ITER]

        network = net(nNodes=nnodes, io = nio.XorIOStream(delay = delay), eta = eta)

        agg = C.DataAggregator(network, niterations)
        return agg
```

In [7]:

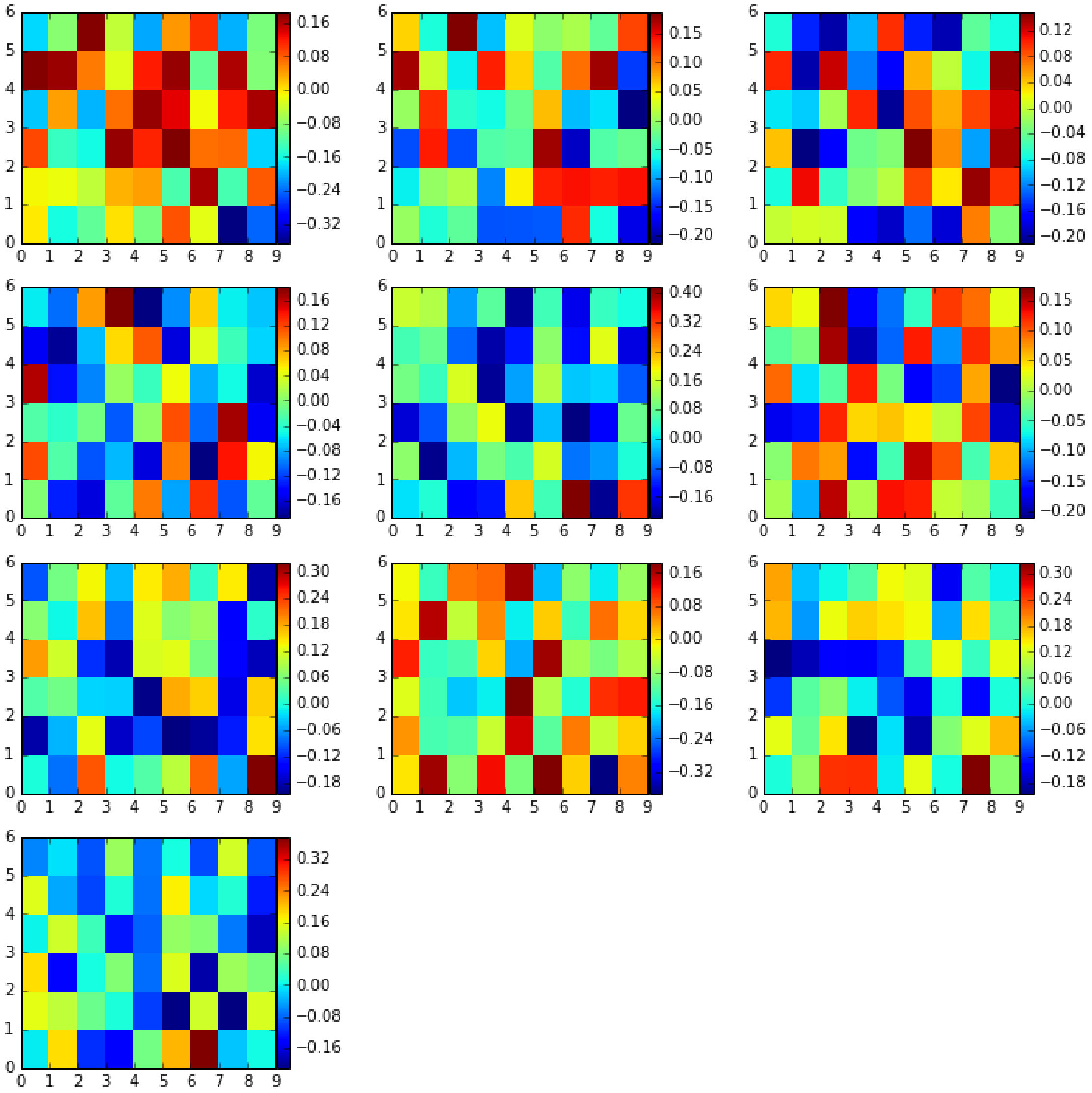
```
    params = [(6, 2, 0.5,100)]*numNets
    networks = map(new_aggregator, params)
    results = C.StochasticSolutionGenerator(networks)
```

Now lets get into plotting

In [19]:

```
print len(results.solutions[0:10])
plot_solutions(results.solutions[0:10])
plt.show()
```

```
10
(4, 3)
```

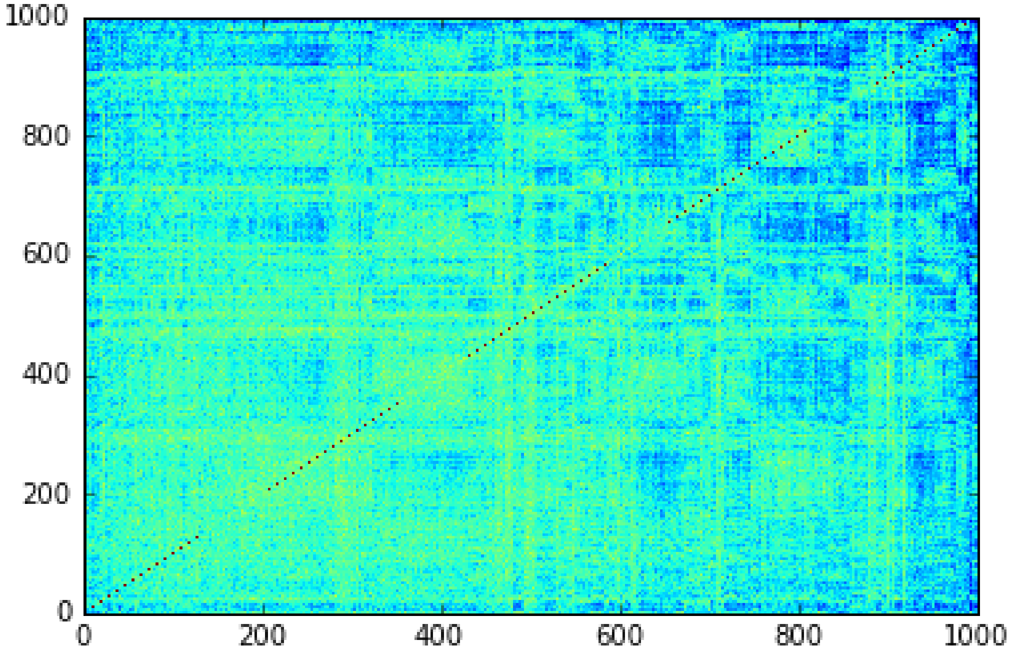


```
In [22]: correlations = results.genCorrelationMatrix()

         Z = sch.linkage(correlations, method='centroid')
         indexs = sch.leaves_list(Z)

         clustered_correl = correlations[indexs][:,indexs]
         ax = plt.figure().add_subplot(111)
         ax.pcolormesh(clustered_correl)

Out[22]: <matplotlib.collections.QuadMesh at 0x113c19cd0>
```



```
In [ ]:
```