

## Instructions for DartNet

### **Step 1- Download from class web page:**

[www.indiana.edu/~busey/Q301/unit3.html](http://www.indiana.edu/~busey/Q301/unit3.html)

you must be at a mac for this to work.

### **Step 2- Find program**

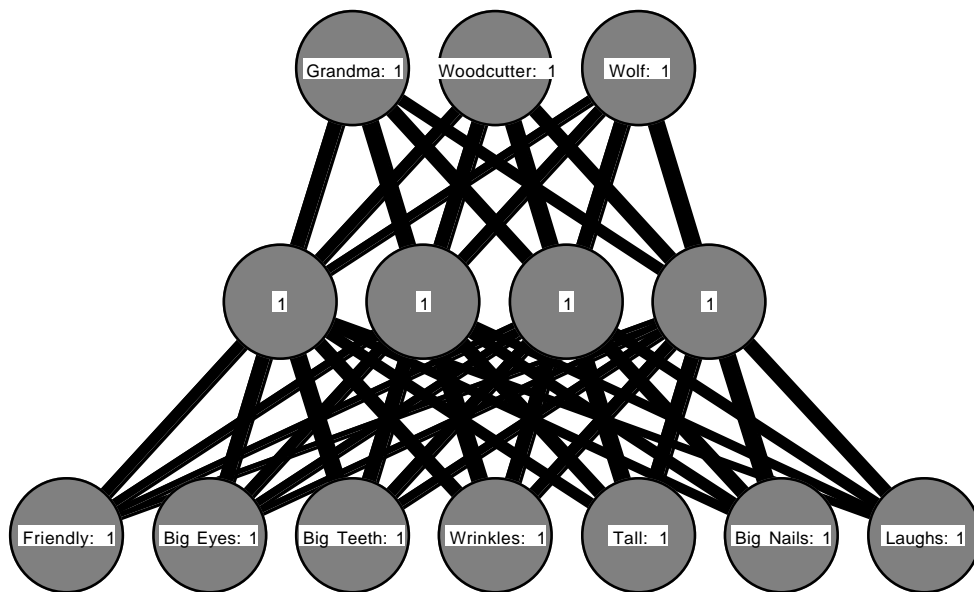
locate the program on your local hard disk and run the DartNet program

### **Step3- Open a network**

choose "Open Network" from the file menu

select "Little Red Riding Hood.net" and open it. The network should look like:

-  +



Untrained Network

### **Step4- Open pattern set**

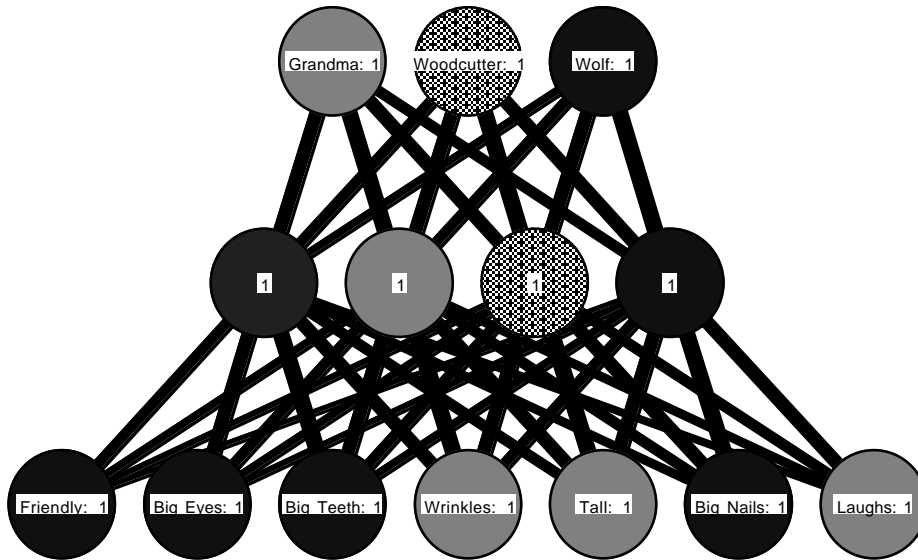
choose "Open Pattern Set" from the file menu

select " Little Red Riding.pats" file.

### Step 5- Train the network

Open the graph window from the display menu then select 'learn' from the session menu. 20000 iterations is fine. Train the network. After training your network should look like:

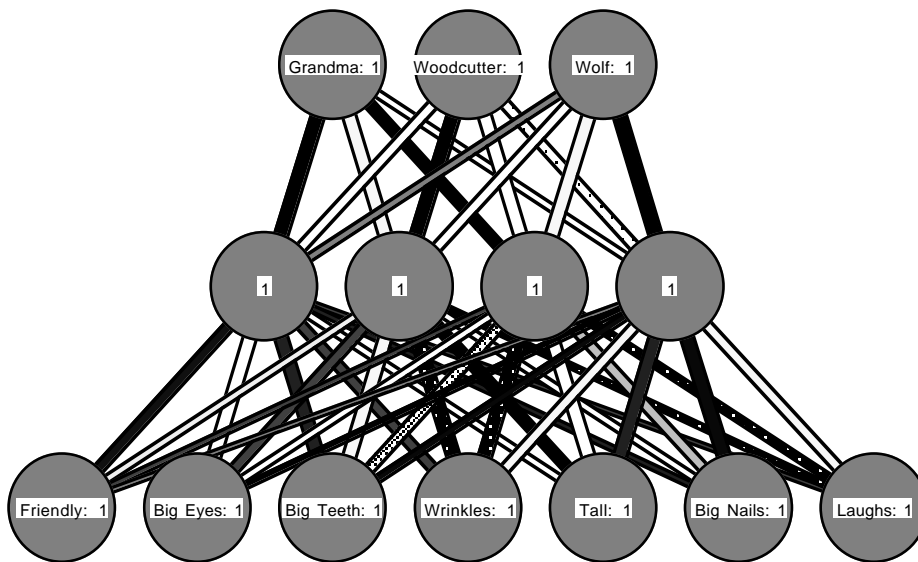
-  +



2102 Epochs, MSE = 0.000000

If you select weight shading then it will look something like this (every case is different):

-  +



Layer: 2

### Step 6- Test the network

After training, you should test the network. Select 'Test' from the session menu and type in these values (which are for grandma):

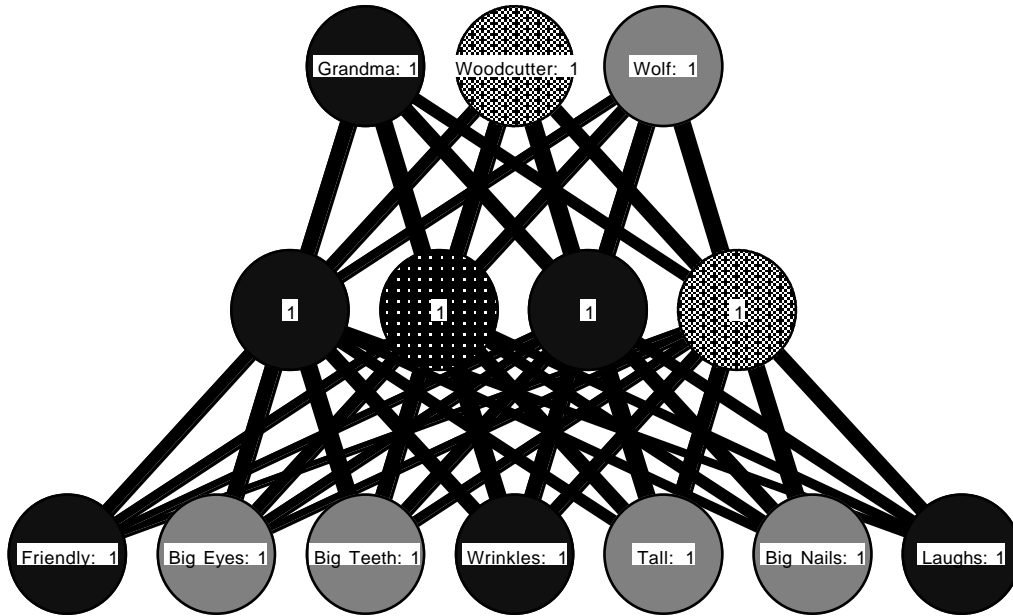
1 0 0 1 0 0 1

It should return something like this:

0.923 .12 .04

and the picture should look like this:

-  +



Layer: 2

with the grandma unit most highlighted (darkest).

This means that the program has identified the creature with the input pattern given above as a grandma.

Now put in this pattern:

1 0 0 1 0 0 0

which is a grandma that doesn't laugh. What happens now?

### Step 7- Investigate catastrophic forgetting

Clear the network by saying 'Reset Session' from the session menu

Open the " Little Red Riding.patsnowood" pattern set using the Open Pattern command from the file menu.

Train the network.

Test it using the grandma pattern set and verify that it understand grandma using Step 6 commands.

Now test it using this set

1 1 0 1 1 0 1

which is the woodcutter. Does it know about woodcutters?

Now teach it about woodcutters by opening this pattern set:

"Little Red Riding.patswood"

**Important:** Don't reset the network. Let it try to preserve what it knows about grandmothers and wolves.

Train the network with this new pattern set that knows *only* about woodcutters.

Test it using the test set for woodcutter:

1 1 0 1 1 0 1

Now test it using the grandmother pattern:

1 0 0 1 0 0 1

Does it know about woodcutters now?

Does it know about grandmothers now?