

INT301 Bio-Computation Week 8 Lab

Radial Basis Function Neural Networks

The following exercise can be used to model an RBF network

```
%Radial Basis Function Network
clear;close all;

%Generate training data (input and target)
p = [0:0.25:4];
t = sin(p*pi);

%Define and train RBF Network
net = newrb(p,t);
plot(p,t,'*r');hold;

%Generate test data
p1 = [0:0.1:4];

%Test network
y = sim(net,p1);

plot(p1,y,'ob');
legend('Training','Test');
xlabel('input, p');
ylabel('target, t');
```

Part 1

Revise demo.m in Week 5 lab with RBF network, to demonstrate the capability of RBF network to model the XOR logic gate.

Part 2

First, demonstrate the capability of an RBF to approximate the function

$$f(t) = \sin(t) * \exp(-t/20); 0 < t < 50$$

Then please try to implement the K-means clustering algorithm in this week's lecture notes for determining the centers. (Hint: you need to write the Matlab code for this part using formulae of RBF network from lecture notes, instead of directly using newrb and sim functions. This is an exercise, thus you don't have to finish this within lab session.)