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MTH540/440 - EAS621/622 - DSC550 Discussion Session

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Topic: Separating Noise from Signals Numerical Experiment.

See the discussion video in mycourses.

```
In[908]:= ClearAll["Global`*"]
(*f[x_]:=Exp[-x^2]*Sin[5*Pi*x]-x*Cos[0.5*Pi*x]*)
f[x_]:=Exp[-x^2]*Sin[15*Pi*x]-x*Cos[0.5*Pi*x]+x*Sin[2*Pi*x]
x=Table[x,{x,-1,2,0.005}];
input=Table[f[x]+RandomReal[{-0.8,0.8}],Length[x]},{i,1,100}];
output=Table[f[x]},{i,1,100}];
asso=Thread[input->output];
net=NetChain[{10,10,10,10,10,10,Length[x]},
  "Input"->Length[x],"Output"->Length[x]]
trained=NetTrain[net,asso]
```

Out[914]= NetChain []

Out[915]= NetChain []

```
In[916]:= g1:=Plot[f[x],{x,-1.5,2.5},PlotRange->{-3,3}];
nf=f[x]+RandomReal[{-0.4,0.4},Length[x]];
r=trained[nf];
g2:=ListPlot[Thread[{x,nf}],ImageSize->Large,PlotStyle->Gray,Joined->True];
g3:=ListPlot[Thread[{x,r}],ImageSize->Large,PlotStyle->Red];
Show[g1,g2,g3]
Show[g1,g3]
```

