Neural network algorithms and related models

package 'netalg'

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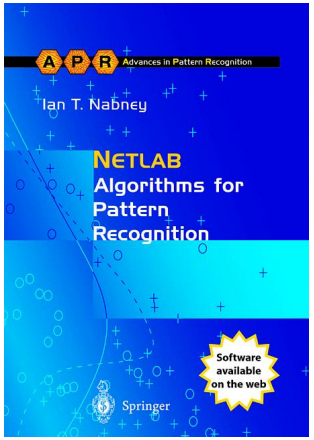
Contents

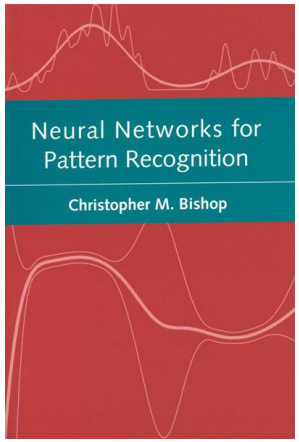
- Regression, Classification
- Density Modelling, Clustering
- Bayesian Methods, Sampling
- Optimization algorithms
- Demo programs

Starting point

Netlab toolbox for Matlab™

http://www.ncrg.aston.ac.uk/netlab/





Contents (2)

- Models & Methods
  - MLP, RBF, MDN
  - GMM, PPCA, GTM, GTM, Neuroscale
  - GLM, PCA, SOM, k-means, KNN
  - Evidence procedure, ARD, GP
  - MCMC, HMC
- Optimization algorithms
  - General purpose: scg, quasinew, ...
  - Model-specific: gmmem, glmtrain, ...
- Demo programs

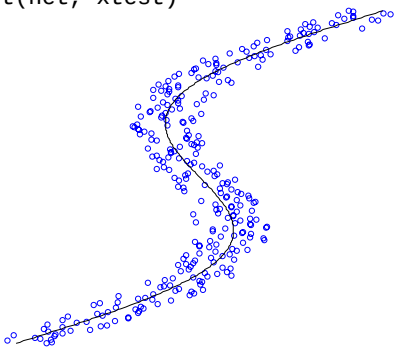
Design

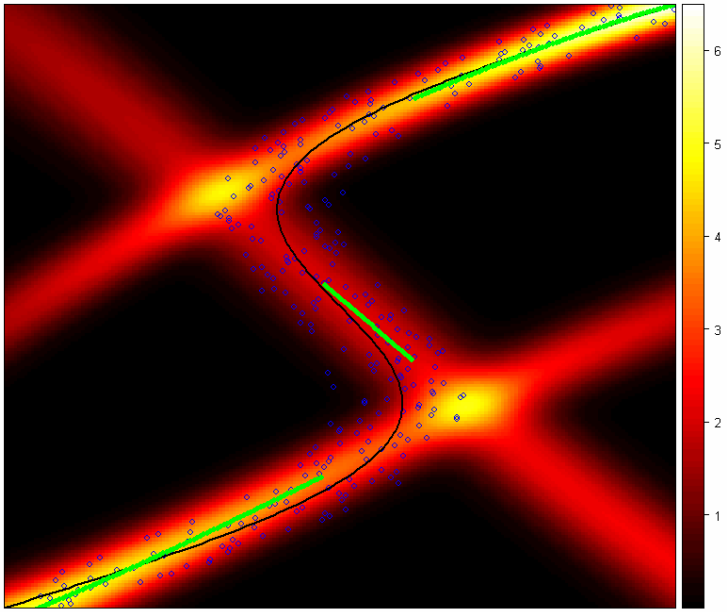
- Complete portation
- Matlab structure → R list
- S3 classes
- Optional output arguments
- Demos: traditional graphics

Example: MDN

$$p(t \mid x) = \sum_{j=1}^{M} \alpha_j(x)\, \phi_j(t \mid x)$$

```
net ← mdn(nin, nhidden, ncentres, dimTarget, 'gaussian')
net ← mdninit(net, alpha, t, initOptions)
net ← netopt (net, options, x, t, 'scg')$net
out ← predict(net, xtest)
```





ToDo

- GUI demos
- Wrapper functions
- Formula interface
- Usage of sparce matrices

use netalg*!*