output nodes

link

x$_1$ x$_2$ x$_3$ ... x$_n$

inputs

input data

X$_0$

X$_1$

cluster

cluster

Case1

Case2

cluster1

cluster2

reference
node

θ_2

θ_1

input

distance

●active ○extinct

input

cluster

cluster   node

time

(a) Transferred clusters to time
    table of cluster

input   output

a node at
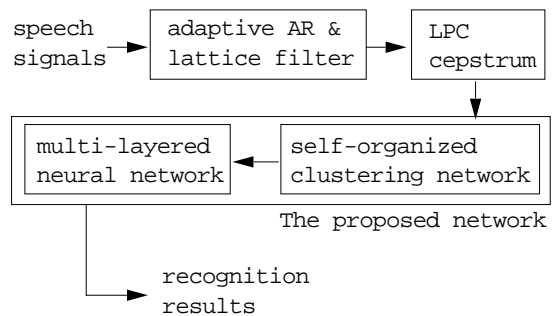input-
layer

cluster

a weighted
connection
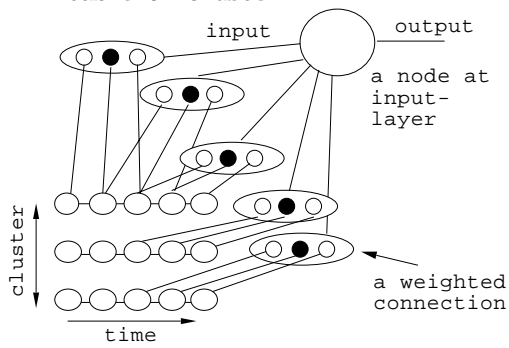
time

(b) The connection of multi-layered
    neural network inputs

output

multi-layered
neural network
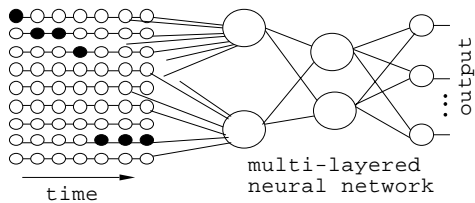
time

(c) The recognition of time-varying
    characteristics by multi-layered
    neural network

$\sum$ —

speech
signals → adaptive AR &
lattice filter → LPC
cepstrum

multi-layered
neural network ← self-organized
clustering network

The proposed network

recognition
results