$ReLU(x) = \max(0, x)$
$x_i w_i$

wEw

EE

$ll_2 f x_i i I w_i$

E

$a_i w_i w_i$
V_i

$\hat{x} i x |V_i| V_i$
$_a eAnAutoencoder(left)andaMulti-LayerPerceptron(right).Theintensityofthegreyineachneuronsymbolizesitsa$
NN
$N-1N-1$
$_s ystem.pdfCooperativeReconstructionSystem.Inthisexample, Views1and3aresendingtheircodedversionoftheindi$
$N-1$
NN^2
$V_i V_j ij V_{i|j} V_i V_i V_j$
$j V_{j|i} V_j i$
$ij V_{j|i} j V_{i|j} V_{i|j} V_{j|i} V_i V_j$
$j V_{i|j}$
$V_{j|i} V_{i|j}$
$V_{i|j} = \{\emptyset\} ijji$
$N-1N-1$
$iN-1 W_i = \{w_{i|j},\, j \in [1..N] \setminus i\} w_{i|j} V_i \widetilde{x}_i$

$\otimes$
$W_i E_i i$
$_i = \frac{1}{|V_i|} \sum_{x_i \in V_i} ||x_i - \widetilde{x}_i||^2$
$= \frac{1}{|V_i|} \sum_{x_i \in V_i} \sum_{k=1}^{\dim(V_i)} (x_i^k - \widetilde{x}_i^k)^2$
$= \frac{1}{|V_i|} \sum_{x_i \in V_i} \sum_{k=1}^{\dim(V_i)} (x_i^k - \sum_{j \in [1..N] \setminus i} w_{i|j}^k x_{i|j}^k)^2$
$x_i^k k x_i E w_{i|j}^k W_i$
$\partial E \frac{}{\partial w^k_{i|j} = \frac{2}{|V_i|} \sum_{x_i \in V_i} x^k_{i|j} \left(\sum_{j \in [1..N] \setminus i} w^k_{i|j} x^k_{i|j} - x^k_i \right) = \frac{2}{|V_i|} \sum_{x_i \in V_i} x^k_{i|j} \left(\widetilde{x}^k_i - x^k_i \right)}$
$w^k_{i|j}$

$\epsilon > 0$
E_i
$\partial E_i \frac{}{\partial w^k_{i|j} = 0 \Rightarrow \frac{2}{|V_i|} \sum_{x_i \in V_i} x^k_{i|j} \left(\widetilde{x}^k_i - x^k_i \right) = 0 \Rightarrow \sum_{x_i \in V_i} \left((x^k_{i|j})^2 w^k_{i|j} + x^k_{i|j} \left(\sum_{j' \in [1..N] \setminus \{i,j\}} w^k_{i|j'} x^k_{i|j'} - x^k_i \right) \right) = 0 \Rightarrow w^k_{i|j} \sum_{x_i \in V_i} (x^k_{i|j})^2 = \sum_{x_i}}$
$w^k_{i|j} \{w^k_{i|j'}, j' \in [1..N] \backslash \{i,j\}\} \{w^{k,t}_{i|j'}, j' \in [1..N] \backslash \{i,j\}\} t w^{k,t+1}_{i|j} t+1$
$\frac{1}{N-1}$
W_i
Wisconsin Diagnostic Breast Cancer (WDBC)
Multi-Features Digital Dataset (MFDD)$\times$
Madelon
Cube$0.1 (0,0,0) (1,0,0) (0,1,0) (0,0,1)$
$Kxy \{x_i\}_{i \in [1..K]} \{y_i\}_{i \in [1..K]}$

xy