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??
ψ
ϕ
$x \in$
R^d
d
$c \in$
R^a
a
S
$\mathcal{U}$
$\mathcal{Y}$
$\mathcal{Y} =$
$\mathcal{U} \cup$
S
n_s
n_u
c^y
$y \in$
$\mathcal{U} \cup$
S
y
$\{(x^i, y^i)\}_{i=1}^{N_s}$
N_s
$X_s \in$
$R^{N_s \times d}$
Y_s
$C_s \in$
$R^{s \times a}$
X_u
C_u
$(X)_i$
i
X
x_i
i
x
$\langle ., . \rangle$
ψ
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??
$u \in$
$\mathcal{U}$

$$P(z_u|x) = \sum_{c \in \{0,1\}^a} P(u|c)p(c|x)$$

(1)

$P(c|x) =$
$\prod_{n=1}^{a} P(c_m|x)$
$P(z_u|a)$

$$P(u|c) = \frac{P(u)P(c|u)}{P(a^u)} = \frac{P(u)1(c = c^u)}{P(c^u)}$$

$$P(u|x) = \frac{P(u)}{P(c^u)} \prod_{n=1}^{a} P(a_n^u|x)$$

(2)

x
$P(c_i|x)$
$P(y_k|x)$

$$P(c_i|x) = \sum_{k=1}^{n_u} P(y_k|x) I(c_i = c_i^{y_k})$$

(3)

$$\hat{y} =_{u \in \mathcal{U}} P(u|x) =_{u \in \mathcal{U}} \prod_{i=1}^{a} \frac{P(c_i^u|x)}{P(c_i^u)}$$

(4)

?
?
?
W
$x^T W$
x
Wc
c

$$F(x, c) = \phi(x)^T W \theta(y)$$

(5)

?
?
?
$s, Y_s; W, \theta) =$
$\frac{1}{N_s} \sum_{n=1}^{N_s} \lambda_{r_\Delta(x_n, y_n)} \sum_{y \in \mathcal{Y}} \max(0, l(x_n, y_n, y))$
$l(x_n, y_n, y) =$
$1(y \neq$
$y_n) +$
$\phi(x_n)^T W \theta(y) -$
$\phi(x_n)^T W \theta(y_n)$