??
??
$\mathcal{A}\Phi\lambda_s\sigma\sigma S_iP$
$\mathbf{W}$
$U_jS_iS_iP\mathbf{W}\alpha$
h
$kn\mathbf{q} =$
$\{q_1, q_2, \ldots, q_j, \ldots, q_k\}$
$q_j \in$
$\{1, -1\}U_j\mathbf{x} =$
$\{x_1, x_2, \ldots, x_j, \ldots, x_k\} =$
$\{p_1q_1, p_2q_2, \ldots, p_jq_j, \ldots, p_kq_k\}$
$\mathbf{p} =$
$\{p_1, p_2, \ldots, p_j, \ldots, p_k\}j{p_j}^2$
$\mathbf{W} = \{w_{ij}\}_{n\times k}$
$w_{ij}ji\mathbf{s}$

$$\mathbf{s} = \mathbf{W}\mathbf{x} \tag{1}$$

$\mathbf{x}\mathbf{W}\mathbf{W}n\times$
$1\mathbf{W} =$
$\{\mathbf{w}_1, \mathbf{w}_2, \cdots, \mathbf{w}_k\}^{\mathrm{T}}$
$\mathbf{G} =$
$\{g_{ij}\}_{k\times n}$
$g_{ij} \in$
$Rg_{ij} =$
$h_{ij}R_{ij}^{-\alpha}$
$h_{ij}R_{ij}S_iU_j\mathbf{y}$

$$\mathbf{y} = \mathbf{G}\mathbf{s}+\mathbf{z} \tag{2}$$

$\mathbf{G}\tilde{z} \in$
$R\tilde{N}_0$
$\mathbf{W}$

$$\mathbf{W} = \mathbf{G}^{\mathrm{T}}(\mathbf{G}\mathbf{G}^{\mathrm{T}})^{-1} \tag{3}$$

T
??????xz

$$\mathbf{y} = \mathbf{x}+\mathbf{z} \tag{4}$$

$j\gamma_j$**??**

$$\gamma_j = \frac{{x_j}^2}{N_0} = \frac{{p_j}^2}{N_0} \tag{5}$$

U_j

$$R_j = \log_2(1+\gamma_j) \tag{6}$$

??

$$\max\ \min\{\gamma_1, \gamma_2, \cdots, \gamma_k\} s.t. \{\, 0 \le (\mathbf{w}_i\mathbf{x})^2 \le P, j = 1, 2, 3, \cdots, k, p_j \ge 0, j = 1, 2, 3, \cdots, k. \tag{7}$$

P

$$\max\ R = \sum_{j=1}^{n} \gamma_j s.t. \{\, 0 \le (\mathbf{w}_i\mathbf{x})^2 \le P, j = 1, 2, 3, \cdots, k, p_j \ge 0, j = 1, 2, 3, \cdots, k. \tag{8}$$

??
$_c luster.pdf$
??
$\mathcal{DS}(x, y) =$
$\{S_1(x_1, y_1), S_2(x_2, y_2), \ldots, S_i(x_i, y_i), \ldots, S_n(x_n, y_n)\}$
$xyi, j \in$
$\{1, 2, \ldots, n\}S_iS_jR_{ij}$
$\mathcal{S}R_{ij}i, j \in$
$\{1, 2, \ldots, n\}\mathcal{G}$
$\mathcal{GV} =$
$\{v_1, v_2, \ldots, v_i, \ldots v_n\}\mathcal{S}i \in$
$\{1, 2, \ldots, n\}$
$S_i \rightarrow$
$v_i\mathcal{GE}\tau i, j \in$
$\{1, 2, \ldots, n\}R_{ij} <$
τ
$e_{ij} \in$
$\mathcal{E}$
$\mathcal{G}e_{ij}v_iv_j\mathcal{GE}\mathbf{A} =$
$\{a_{ij}\}_{n\times n}$

$$a_{ij} = \{\, 1 , e_{ij} \in \mathcal{E}, 0, e_{ij} \notin \mathcal{E}. \tag{9}$$