

Minimize $\sum_{j \in S} \sum_{i \in I_j} (\alpha_i^j M_i^j + \beta_i^j V_i^j)$

Nonnegative weights

Subject to :

Measure of undercoverage

Set of coverage intervals obtained for sensor j

$$\sum_{k \in A} (a_{ik}^j X_k) + M_i^j \geq l \quad \forall i \in I_j, \forall j \in S$$

Desired level of coverage

$$\sum_{k \in A} (a_{ik}^j X_k) - V_i^j \leq l \quad \forall i \in I_j, \forall j \in S$$

Set of sensors

Measure of overcoverage

$$X_k \in \{0, 1\}, \forall k \in A$$

Subset of alive sensors

$$M_i^j, V_i^j \in \mathbb{R}^+$$

Number of active sensors in the coverage interval i for sensor j

Indicator function of whether sensor k is involved in coverage interval i of sensor j

Determine the activation of sensor k in the sensing phase