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

Subject to:

measure of undercoverage.

Number of active sensors in the coverage interval i 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.

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

measure of overcoverage.

determine the activation of sensor k in the sensing phase.

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

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

S represents the set of sensor nodes.
$A \subseteq S$ is the subset of alive sensors.
I_j designates the set of coverage intervals (CI) obtained for sensor j.
a_{ik}^j is indicator function of whether sensor k is involved in coverage interval i of sensor j.
α_i^j and β_i^j are nonnegative weights.