(1) $\hat{R}_{SA}(N) = \underset{R}{\operatorname{argmin}}\, V_{SA}(R,N)$

$$V_{SA}(R,N) = \sum_{k=1}^{N} (R(k) - R)^2$$

$$\frac{\partial}{\partial R} V_{SA} = \phi \qquad 2 \sum_{k=1}^{N} (R(k) - R) = \phi$$

$$\boxed{\hat{R}_{SA} = \frac{1}{N} \sum_{k=1}^{N} \frac{v(k)}{i(k)}}$$

(2) $\hat{R}_{LS} = \underset{R}{\operatorname{argmin}}\, V_{LS}(R, v, i)$

$$V_{LS}(R, v, i) = \sum_{k=1}^{N} (v(k) - R\, i(k))^2$$

$$\frac{\partial}{\partial R} V_{LS} = \phi \qquad 2 \sum_{k=1}^{N} (v(k) - R\, i(k))\, i(k) = \phi$$

$$\boxed{\hat{R}_{LS} = \frac{\frac{1}{N} \sum_{k=1}^{N} v(k)\, i(k)}{\frac{1}{N} \sum_{k=1}^{N} i^2(k)}}$$

(3) $\hat{R}_{EV} = \underset{R}{\operatorname{argmin}} \left[\underbrace{\sum_{k=1}^{N} (v(k) - v_p)^2 + \sum_{k=1}^{N} (i(k) - i_p)^2}_{V_{EV}} + \lambda (v_p - R\, i_p) \right]$

(CONSTRAINT OPTIMIZATION)

CRITERION — LAGRANGE MULTIPLIER — CONSTRAINT

$$\frac{\partial}{\partial R} V_{EV} = -\lambda \cdot i_p = \phi \qquad \lambda = \phi$$

$$\frac{\partial}{\partial i_p} V_{EV} = 2 \sum_{k=1}^{N} (i(k) - i_p) = \phi \qquad i_p = \frac{1}{N} \sum_{k=1}^{N} i(k)$$

$$\frac{\partial}{\partial v_p} V_{EV} = 2 \sum_{k=1}^{N} (v(k) - v_p) = \phi \qquad v_p = \frac{1}{N} \sum_{k=1}^{N} v(k)$$

$$\frac{\partial}{\partial \lambda} V_{EV} = v_p - R\, i_p = \phi$$

$$\boxed{\hat{R}_{EV} = \frac{\frac{1}{N} \sum_{k=1}^{N} v(k)}{\frac{1}{N} \sum_{k=1}^{N} i(k)}}$$