

$$(\mu, \kappa, \lambda, \rho)ES := (P^{(0)}, \mu, \kappa, \lambda, \text{rec}, p_r, \rho, \gamma, \omega, \text{mut}, p_m, \tau, \tau_0, \delta, \beta, \text{sel}, \zeta, t, \varepsilon)$$

with

$P^{(0)} := (\mathbf{a}_1, \dots, \mathbf{a}_\mu)^{(0)} \in I^\mu$	$I := \mathbb{N}_0 \times \mathbb{R}^n \times \mathbb{R}_+^{n_c} \times [-\pi, \pi]^{n_o}$	start population
$\mu \in \mathbb{N}$	$\mu \geq 1$	number of parents
$\kappa \in \mathbb{N}$	$\kappa \geq 1$	upper limit for life span
$\lambda \in \mathbb{N}$	$\lambda > \mu$ if $\kappa = 1$	number of offspring
$\text{rec} : I^\mu \rightarrow I$		recombination operator
$p_r \in \mathbb{R}_+^3$	$0 \leq p_r \leq 1$	recombination probability
$\rho \in \mathbb{N}^3$	$1 \leq \rho \leq \mu$	number of ancestors for each descendant
$\gamma \in \mathbb{N}^3$	$1 \leq \gamma \leq n_x - 1$	number of crossover sites in a string of n_x elements
$\omega \in \{0, 1, 2, 3, \dots\}^3$	$\gamma \geq \rho - 1$	type of recombination
$\text{mut} : I \rightarrow I$		mutation operator
$p_m \in \mathbb{R}_+^3$	$0 < p_m \leq 1$	mutation probability
$\tau, \tau_0, \delta \in \mathbb{R}_+$	$0 \leq \delta \leq 1$	step length variabilities
$\beta \in \mathbb{R}_+$	$0 \leq \beta \leq \frac{\pi}{4}$	correlation variability
$\text{sel} : I^{\mu+\lambda} \rightarrow I^\mu$		selection operator
$\zeta \in \mathbb{N}$	$2 \leq \zeta \leq \mu + \lambda$	tournament participators
$t : I^{2\mu} \rightarrow \{0, 1\}$		termination criterion
$\varepsilon \in \mathbb{R}_+^4$		accuracies required.