

Evolutionary Algorithms: Real-Parameter Evolutionary Algorithms

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<http://cw.felk.cvut.cz/doku.php/courses/a4m33bia/start>

Extended Mutation Operator

Mutation operator m modifies all components of the object parameter x^t according to

$$x'^t = x^t + \mathbf{N}_0(\sigma^t)$$

while the σ^t variances are dynamically adjusted (all at the same time) according to

$$\sigma^{t+n} = \begin{cases} c_d \cdot \sigma^t & , \text{ if } p_s^t < 1/5 \\ c_i \cdot \sigma^t & , \text{ if } p_s^t > 1/5 \\ \sigma^t & , \text{ if } p_s^t = 1/5 \end{cases}$$

where p_s^t is the frequency of successful mutations, measured over $10n$ trials.

Recommended setup:

- increase step size: $c_i = 1/0.82$,
- decrease step size: $c_d = 0.82$,
- adjustment takes place every n mutations.

