

RDG3+DEEPSO
Recursive Differential Grouping 3 and
Differential Evolutionary Particle Swarm
Optimization

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Recursive Differential Grouping 3

- Divide-and-conquer approach to tackle large-scale optimization problem
- RDG3 groups decision variables that interacts each others closely.
- Decision variables are divided into two groups, dependent group and independent group, by RDG3

ex)

$$\mathbf{x} = (x_1, x_2, x_3, x_4, x_5)$$

$$\text{Minimize } f(\mathbf{x}) = x_1x_2 + x_3 + x_4x_5$$

RDG3



Independent group : (x_3)

Dependent group : (x_1, x_2, x_4, x_5)

RDG3 + DEEPSO

RDG3

Find two groups, dependent group G_d and independent group G_i :
 $G_d, G_i = \text{RDG3}(\mathbf{x})$



DEEPSO

Repeat until maximum function evaluation :

- 1, optimize G_i of \mathbf{x} while fixing G_d of \mathbf{x} :
 $\mathbf{x} \leftarrow \text{DEEPSO}(\mathbf{x})$
- 2, optimize G_d of \mathbf{x} while fixing G_i of \mathbf{x} :
 $\mathbf{x} \leftarrow \text{DEEPSO}(\mathbf{x})$