差分　化算法研究

告人：　良旭

Classic DE算法

$$x_{i,g} = \{x_{i,g}^1, x_{i,g}^2, \dots x_{i,g}^D\},\ i = 1,2,\dots,NP, g = 1,2,\dots,g_{max}$$

$$v_{i,g} = x_{r1,g} + F * (x_{r2,g} - x_{r3,g}), r1 \neq r2 \neq r3 \neq i$$

$$u_{i,g}^j = \begin{cases} v_{i,g}^j, & \text{如果}(rand(0,1) \leq CR \ \text{或者}\ j = j_{rand}) \\ x_{i,g}^j, & \text{否则} \end{cases}$$

$$u_{i,g}^j = L^j + rand(0,1) * (U^j - L^j)$$

$$x_{i,g+1} = \begin{cases} u_{i,g}, & \text{如果} f(u_{i,g}) < f(x_{i,g}) \\ x_{i,g}, & \text{否则} \end{cases}$$

JADE算法

$[0,1]$ $\mu_F = (1-c)\cdot\mu_F + c\cdot L_2(S_f)$ $\mu_F \in$

$\mu_{CR} = (1-c)\cdot\mu_{CR} + c\cdot L_1(S_{cr})$ $\mu_{CR} \in [0,1]$

$$L_p(Z_1, Z_2, \ldots, Z_n) = \frac{\sum_{k=1}^{n} z_k^p}{\sum_{k=1}^{n} z_k^{p-1}}, \quad p =$$

jDE算法

$$F' = \begin{cases} 0.1 + rand1 * 0.9 & 如果rand0 < pi1 \\ F & 否则 \end{cases}$$

$$CR' = \begin{cases} rand3 & 如果rand2 < pi2 \\ CR & 否则 \end{cases}$$

b6e6rl算法

- 0.5 0.8 0 0.5 1.0 6
- DE/rand/1/bin DE/rand/1/exp 12
-

$$q_i = \sum_{j=1}^{i} p_i$$

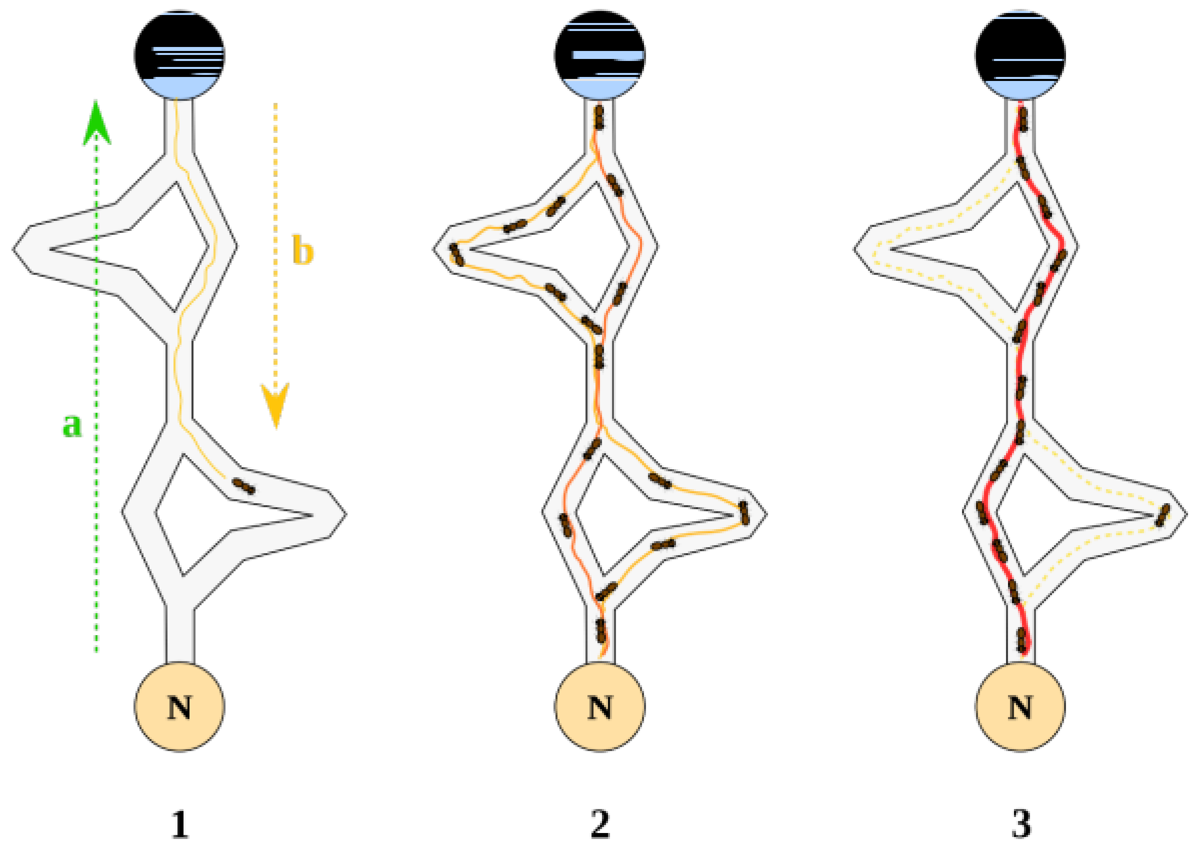
-
- , 1/12

差分 化算法差分策略

名称	差分策略	差分表
DS_1	DE/rand/1/bin	$X_{r1}+F*(X_{r2}-X_{r3})$
DS_2	DE/rand/2/bin	$X_{r1}+F*(X_{r2}-X_{r3}+X_{r4}-X_{r5})$
DS_3	DE/best/1/bin	$X_{best}+F*(X_{r1}-X_{r2})$
DS_4	DE/best/2/bin	$X_{best}+F*(X_{r1}-X_{r2}+X_{r3}-X_{r4})$
DS_5	DE/rand-to-best/bin	$X_{r1}+F*(X_{best}-X_{r1}+X_{r2}-X_{r3})$
DS_6	DE/current-to-best/bin	$X_i+F*(X_{best}-X_i+X_{r1}-X_{r2})$
DS_7	DE/current-to-rand/bin	$X_i+F*(X_{r1}-X_i+X_{r2}-X_{r3})$

群　化算法

群　化算法原理



策略池

■ 5

1. Classic DE DE/rand/1/bin
2. Classic DE DE/rand/1/exp
3. Improved JADE IQE
4. Improved jDE IQE
5. IQE IQE

■ JADE jDE NP F CR F_i CR_i NP F_i CR_i F_i CR_i i IQE JADE jDE

群 裁剪策略

■

■

$$d_{12} = \sqrt{\sum_{k=1}^{n}(x_{1k} - x_{2k})^2}$$

■ dmin

$$d_{min} = d_{bw} * \omega$$

差分　化中的个体　量　价思想

■

DE　DE

■

■

群个体　　　机制

-

  1

  2

  3

IQE控制参数 置

$$F_i' = N(\mu, \sigma^2),\ i = 1, \cdots NP, F_i' \in [0.1, 0.9]$$

$$CR_i' = N(\mu, \sigma^2),\ i = 1, \cdots NP, CR_i' \in [0.1, 0.9]$$

IQE 异策略

- DE/current-to-rand/1/bin
  DE/current-to-best/1/bin

$$v_i = \begin{cases} X_i + F_i * (X_{r1} - X_i) + F_i * (X_{r2} - X_{r3}), & X_i \in \text{优势个体} \\ X_i + F_i * (X_{rs} - X_i) + F_i * (X_{r1} - X_{r2}), & X_i \in \text{劣势个体} \end{cases}$$

- DE/rand-to-rand/1/bin
  DE/rand-to-best/1/bin

$$v_i = \begin{cases} X_{r1} + F_i * (X_{r2} - X_{r1}) + F_i * (X_{r3} - X_{r4}), & X_i \in \text{优势个体} \\ X_{r1} + F_i * (X_{rs} - X_{r1}) + F_i * (X_{r2} - X_{r3}), & X_i \in \text{劣势个体} \end{cases}$$

群个体 束放松 理

ε−Constraint EC

$$\varepsilon(0) = cv(X_\theta)$$

$$\varepsilon(g) = \begin{cases} \varepsilon(0)\left(1 - \frac{g}{G_c}\right)^{cp}, & 0 < g < G_c \\ 0, & g \geq G_c \end{cases}$$

群个体 度EDA 理

$$X'_{r,d} = N(X_{r,d}, dp\ )\ , d = 1, \cdots D, X'_{r,d} \in [X_d^l, X_d^u]$$

典型科研　目

-
- Supercontral
-
-
-

文成果

- A mixed integer programming model for gas distribution problem with complex gas applied characteristics,
-
-

科研

-
-
-
-
- Python .NET