Our proposal (GSK-IF)
Fabricio Loor - UNSL - Arg

- Based on AGSK

Evaluating the Performance of Adaptive Gaining-Sharing Knowledge Based Algorithm on CEC 2020 Benchmark Problems

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- Nature-based of Gaining and Sharing Knowledge (AGSK).

PSEUDO-CODE

1. $g \leftarrow 1$;
2. Generate N points randomly (pop);
3. Evaluate points
4. **while** (termination criteria are not met) **do**
5.   Compute the number of Gained and Shared Points
6.   **Calculate influence factor**
7.   **Junior gaining-sharing knowledge phase**
8.   **Senior gaining-sharing knowledge phase**
9.   Check constraints
10.   Evaluate points
11.   Selection with an elitist criterion
12.   **Calculate the improvement of each settings**
13. $g \leftarrow g + 1$;
14. **end while**

Calculate influence factor i_f

$$a = (gen_{max} - gen)/gen_{max}$$

$$i_f = \exp(1 - \frac{1}{a^{pow}})$$
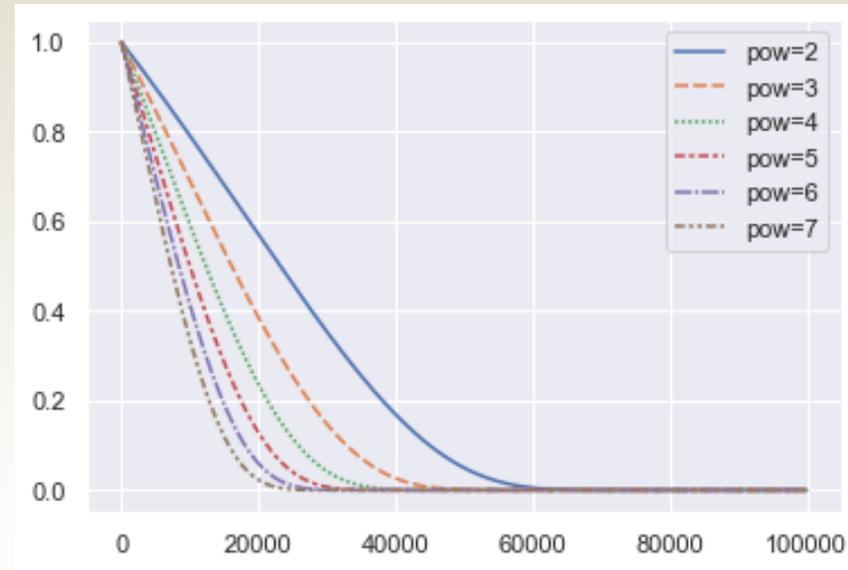
Junior and Senior gaining-sharing knowledge phase (like mutation phase)

Junior phase	Senior phase

Foreach point i
 For j = 1:D
 if(rand <= k_r) (Knowledge ratio)
 if($f(x_i) < f(x_r)$)
 $x_{i,j}{}^{new} = x_i + k_f * [(x_{i-1} - x_{i+1}) + \boldsymbol{i_f} * (x_r - x_i)]$
 else
 $x_{i,j}{}^{new} = x_i + k_f * [(x_{i-1} - x_{i+1}) + \boldsymbol{i_f} * (x_i - x_r)]$
 Endif
 Else $x_{i,j}{}^{new} = x_{i,j}{}^{old}$
 Endfor
 Endforeach
	Foreach point i
	 For j = 1:D
	 if(rand <= k_r) (Knowledge ratio)
	 if($f(x_i) < f(x_m)$)
	 $x_{i,j}{}^{new} = x_i + k_f * [(x_{p-best} - x_{p-worst}) + \boldsymbol{i_f} * (x_m - x_i)]$
	 else
	 $x_{i,j}{}^{new} = x_i + k_f * [(x_{p-best} - x_{p-worst}) + \boldsymbol{i_f} * (x_i - x_m)]$
	 Endif
	 Else $x_{i,j}{}^{new} = x_{i,j}{}^{old}$
	 Endfor
	 Endforeach

$Sorted\ Points: [x_{best}, x_{best+1}, x_{best+2}, …, x_{i-1}, x_i, x_{i+1}, …, x_{worst-2}, x_{worst-1}, x_{worst}]$