I tried 2 configurations on Rastrigin function & 1 config on parabola  
(最後繳交的是 population size=10, generation count=50 的 cfg)

sigma decreases

after converge

0416235 劉昱劭

如果格式跑掉，麻煩助教由此打開pdf檔：<https://bit.ly/EChw5_0416235>

|  |  |
| --- | --- |
| population size=10  generation count=50 | C:\Users\user\Downloads\Telegram Desktop\Telegram Archive\_Ｗ_敹怎 2019-04-22 銝_8.56.59.png  converge |
| population size=20  generation count=50 | C:\Users\user\Downloads\Telegram Desktop\Telegram Archive\_Ｗ_敹怎 2019-04-22 銝_8.56.09.png  converge |
| population size=20  generation count=50 | C:\Users\user\Downloads\Telegram Desktop\Telegram Archive\_Ｗ_敹怎 2019-04-22 銝_8.59.09.png  converge |

We could find that sigma decrease after best fitness value about to converge, and eventually sigma would converge to about zero.

4. compare avg/std of fitness value with hw4 (rastrigin)

Both with same configurations: **population size=10, generation count=50**

|  |  |
| --- | --- |
| hw4(EV1) | /Users/ailurus/Desktop/螢幕快照 2019-04-06 下午9.08.20.png |
| hw5(EV2) | C:\Users\user\Downloads\Telegram Desktop\Telegram Archive\_Ｗ_敹怎 2019-04-22 銝_8.56.59.png |

EV2 produces more children to replace the worst individual, which cause more “good individuals” appears in the population, so that EV2 could increase the speed of convergence.

Thus, EV2‘s average & stdev of fitness value converge faster than EV1. 4. compare avg/std of fitness value with hw4 (parabola)

Both with same configurations: **population size=20, generation count=50**

|  |  |
| --- | --- |
| hw4(EV1) | C:\Users\user\AppData\Local\Microsoft\Windows\INetCache\Content.Word\111.jpg |
| hw5(EV2) | C:\Users\user\Downloads\Telegram Desktop\Telegram Archive\_Ｗ_敹怎 2019-04-22 銝_8.59.09.png |

It seems like parabola is too simple so that both EV1 & EV2 converge fast.

5. "adaptive mutation strength vs. generation count"

sigma decreases

after converge

|  |  |
| --- | --- |
| population size=10  generation count=50 | C:\Users\user\Downloads\Telegram Desktop\Telegram Archive\_Ｗ_敹怎 2019-04-22 銝_8.56.59.png  converge |
| population size=20  generation count=50 | C:\Users\user\Downloads\Telegram Desktop\Telegram Archive\_Ｗ_敹怎 2019-04-22 銝_8.56.09.png  converge |
| population size=20  generation count=50 | C:\Users\user\Downloads\Telegram Desktop\Telegram Archive\_Ｗ_敹怎 2019-04-22 銝_8.59.09.png  converge |

We could find that sigma decrease after best fitness value about to converge, and eventually sigma would converge to about zero.