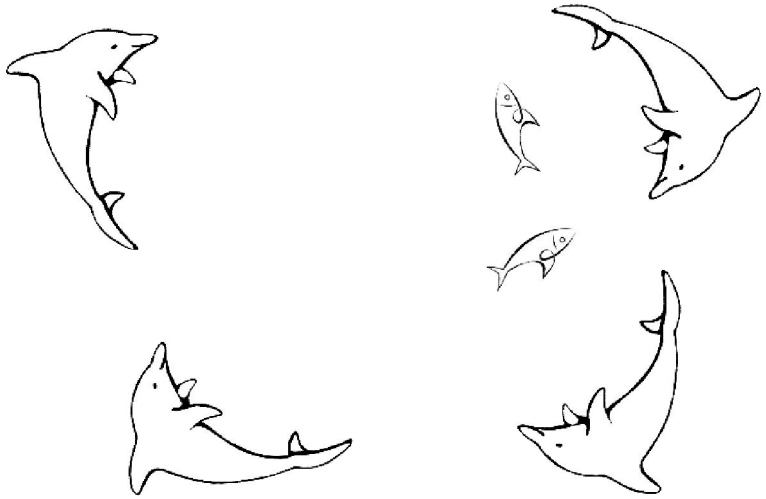
SwarmsLAB

Evolution with the world

SxLAB Family Member



SwarmDolphin

-- The Swarm Dolphin Algorithm (SDA)

Ver. 1001

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leo.chen.yi@live.co.uk
20-Mar-2014

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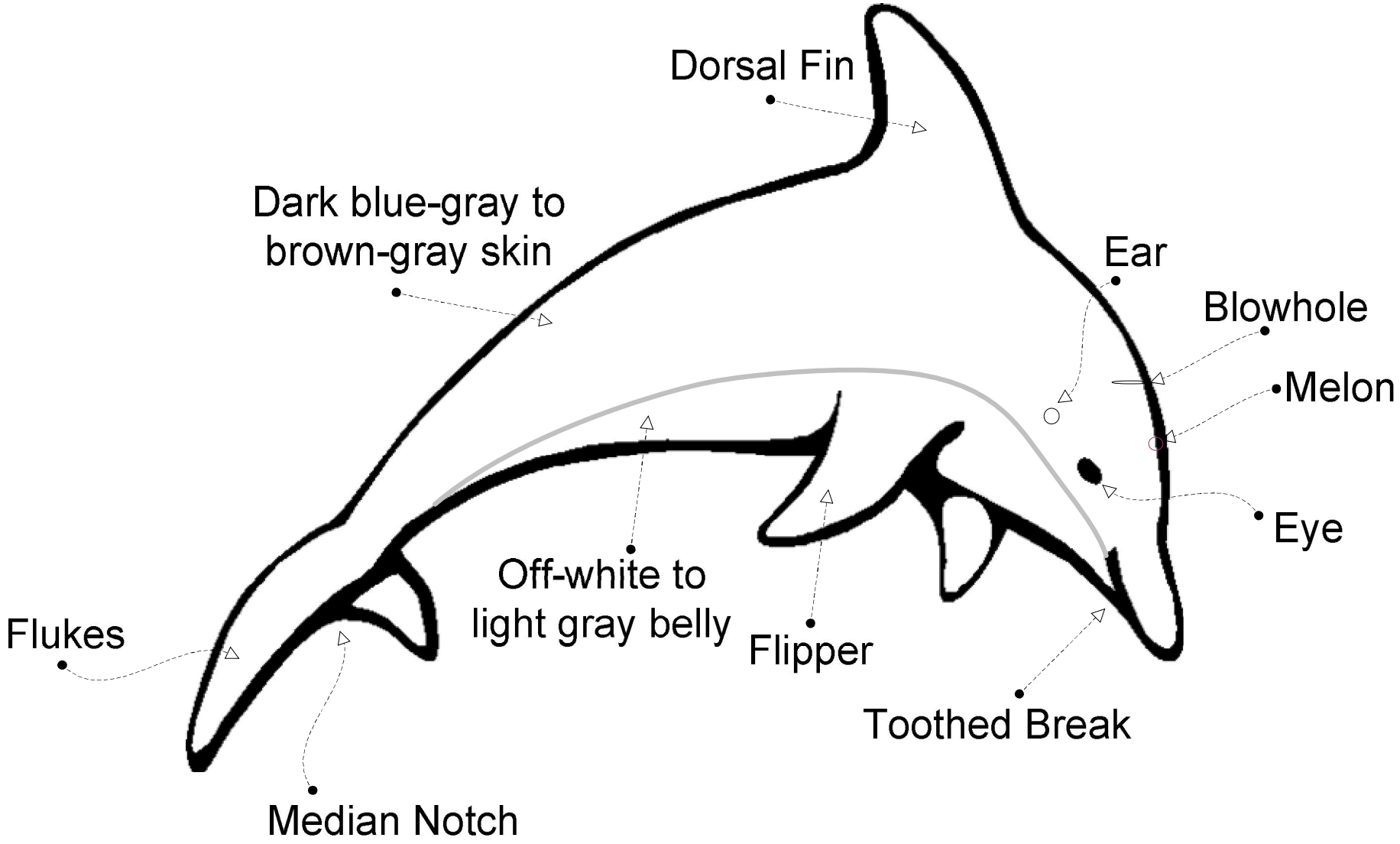
What is the Swarm Dolphin Algorithm (SDA)



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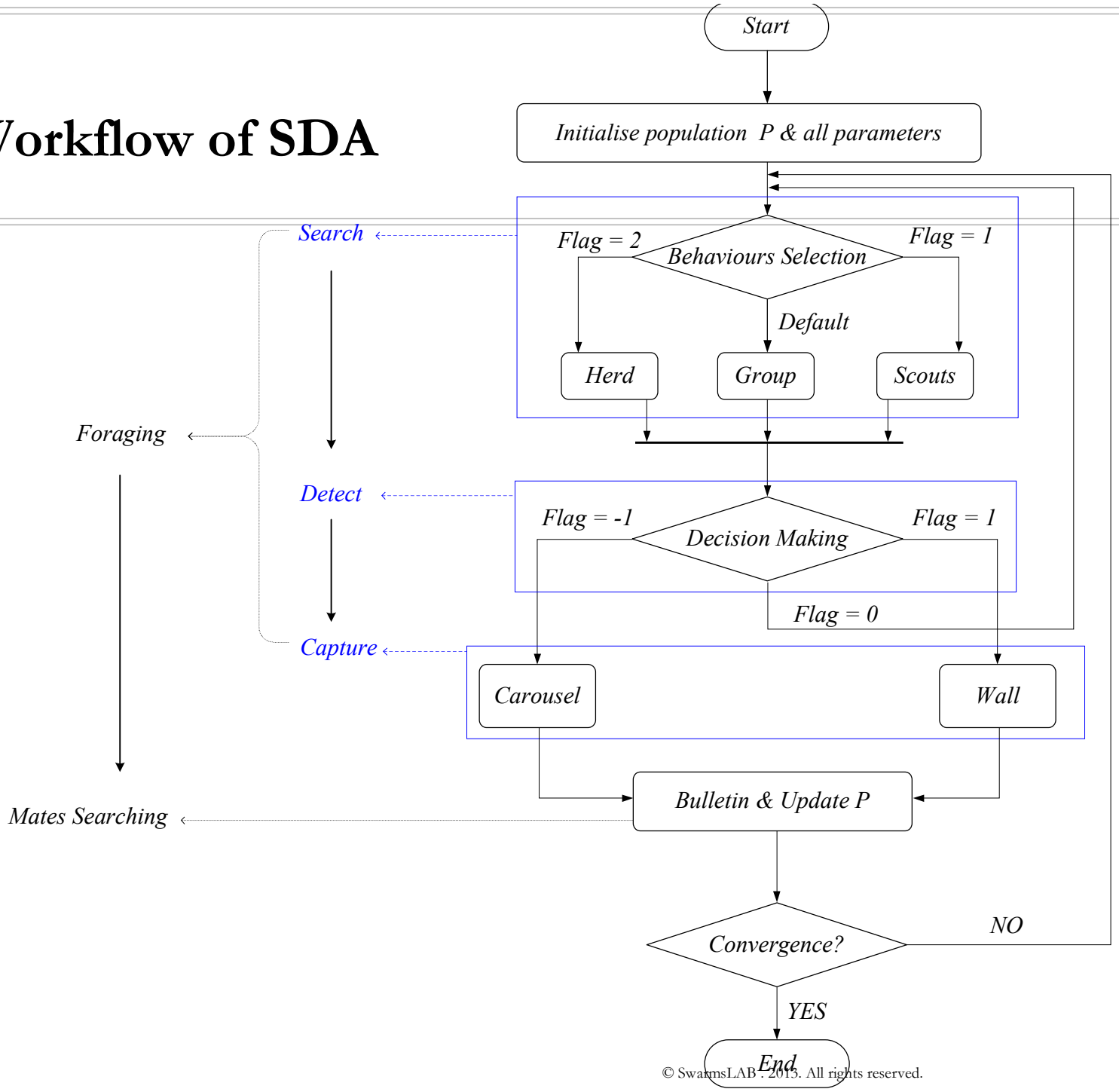
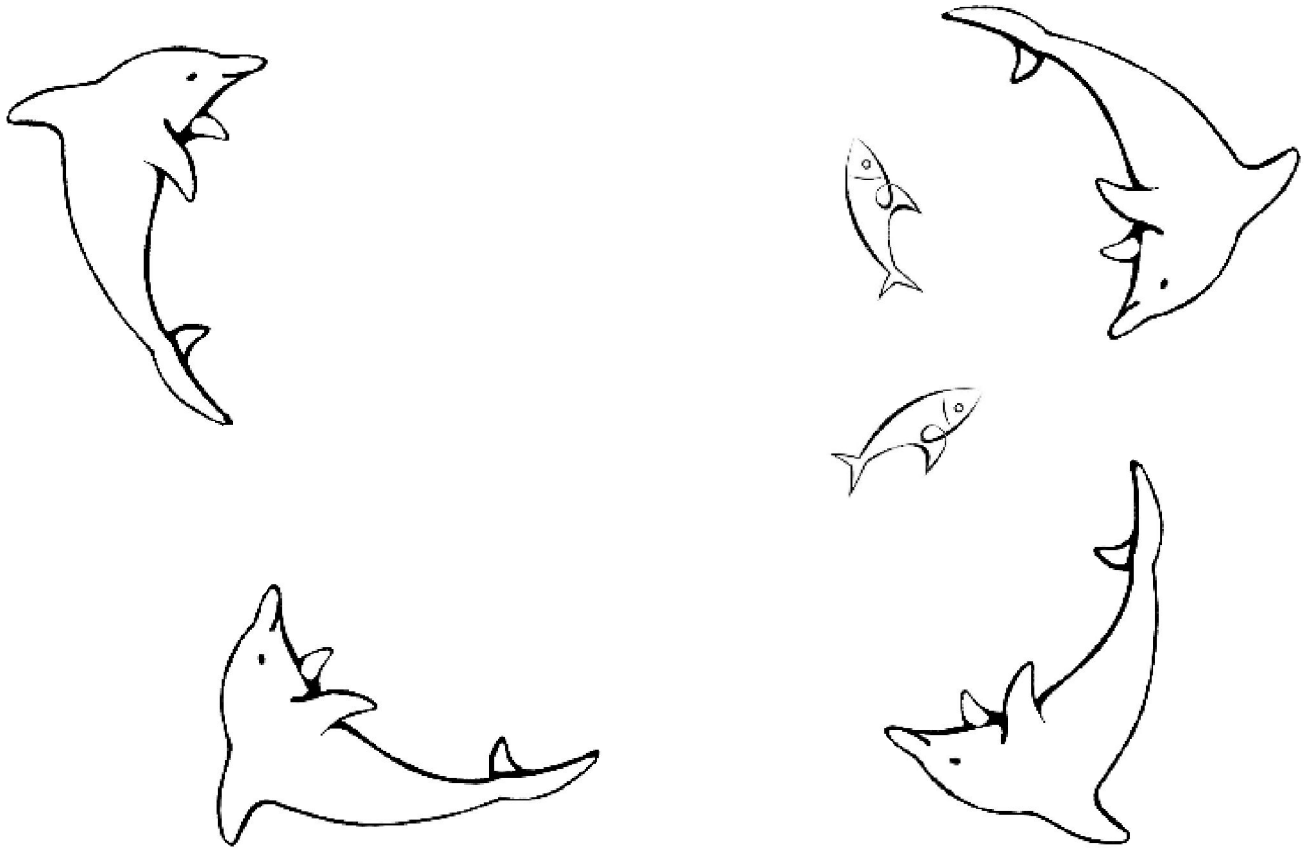
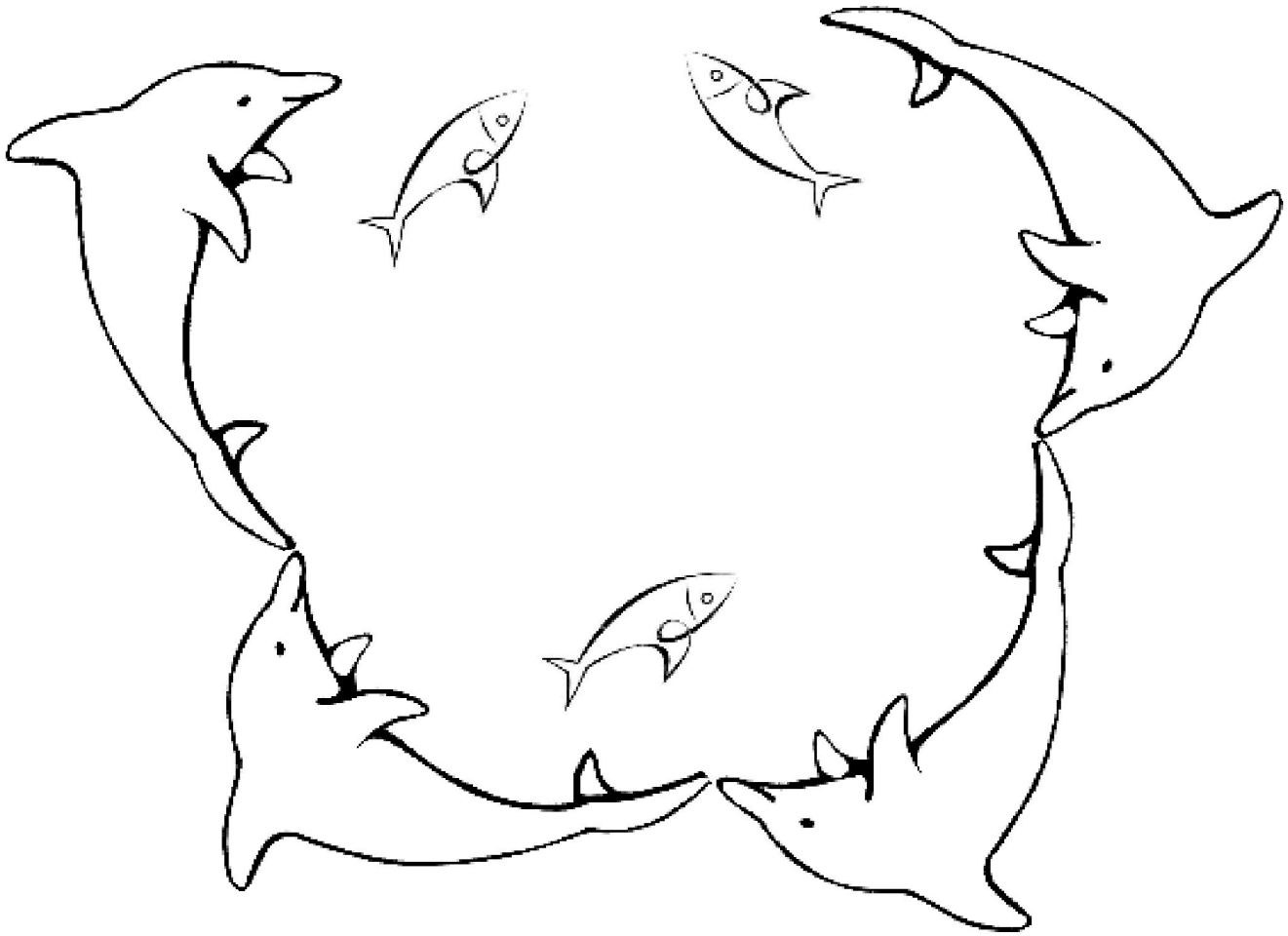
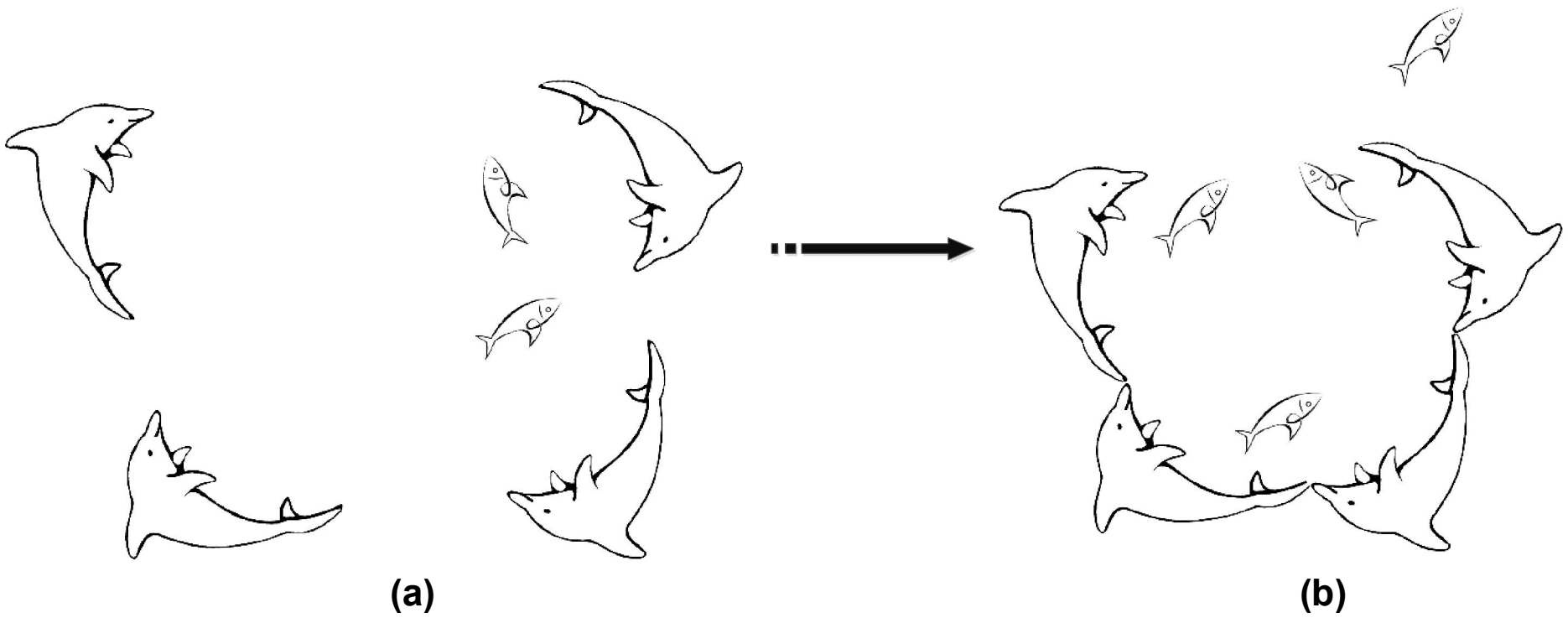
Workflow of SDA









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How to download SwarmBat

1. www.mathworks.com >> File Exchange

Search 'SwarmDolphin'

http://www.mathworks.co.uk/matlabcentral/fileexchange/45965-swarmdolphin-the-swarm-dolphin-algorithm-sda

2. Skydrive

http://1drv.ms/1nGzn1x

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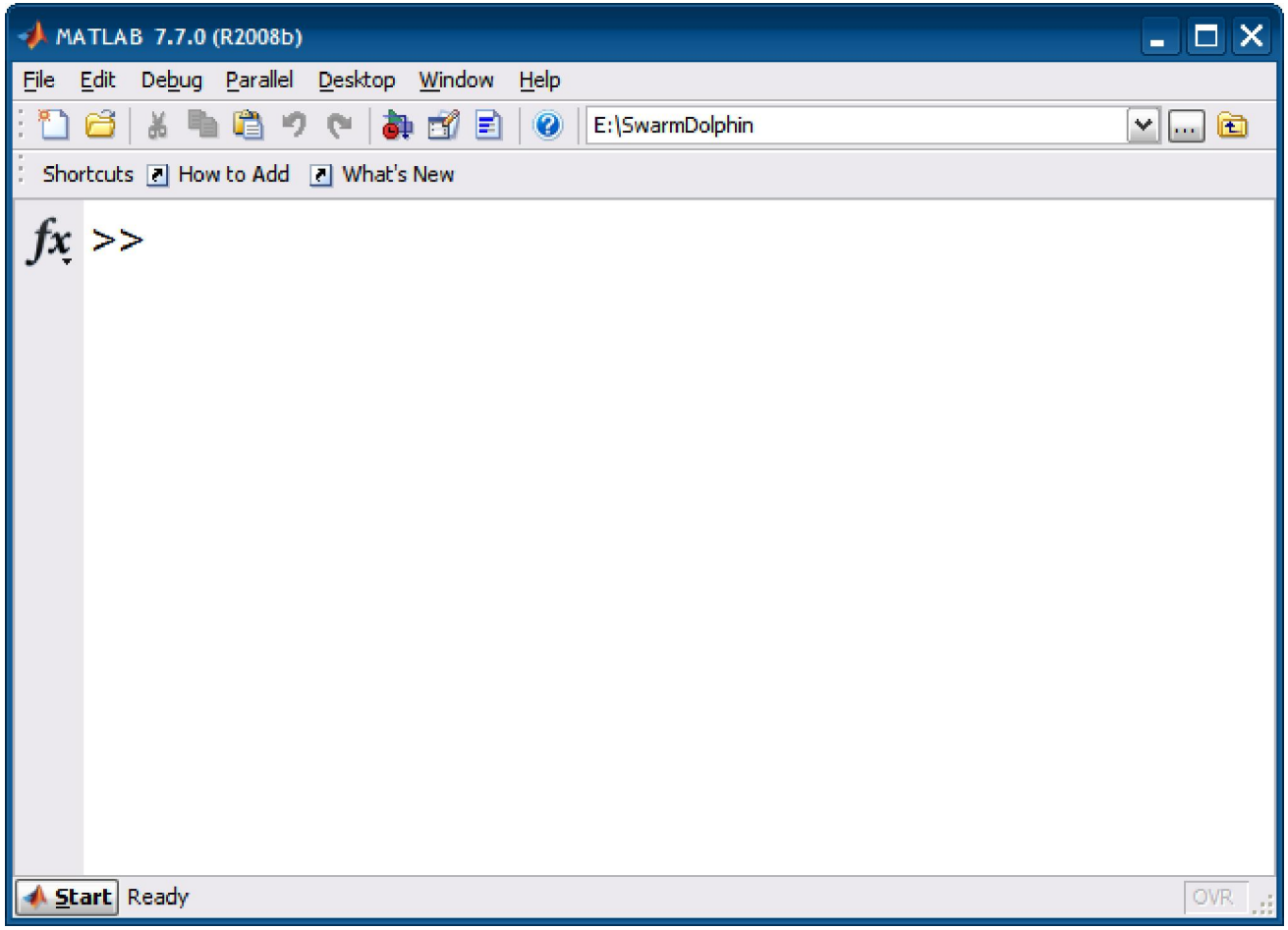
How to set work path for SwarmDolphin



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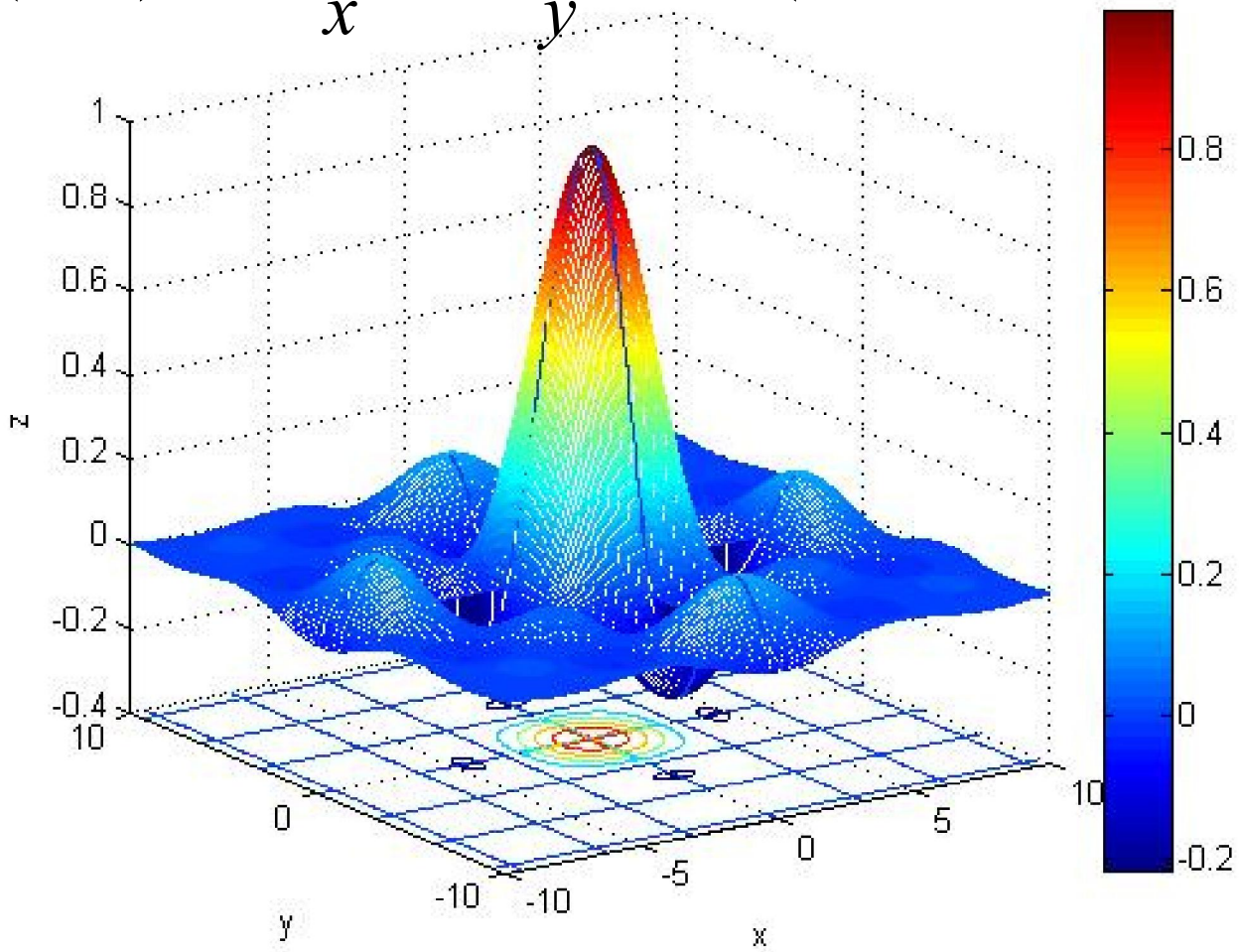
- Case Study 1: Single Objective Problem
- Case Study 2: Multi-objective Problem

Case Study 1 – Single Objective Without Constraints

$$Max: f(x,y) = \frac{\sin(x)}{x}\frac{\sin(y)}{y} \qquad (-10 \le x \le 10, -10 \le y \le 10)$$



Case Study 1 – Single Objective Without Constraints

$$Max: f(x,y) = \frac{\sin(x)}{x}\frac{\sin(y)}{y} \qquad (-10 \le x \le 10, -10 \le y \le 10)$$

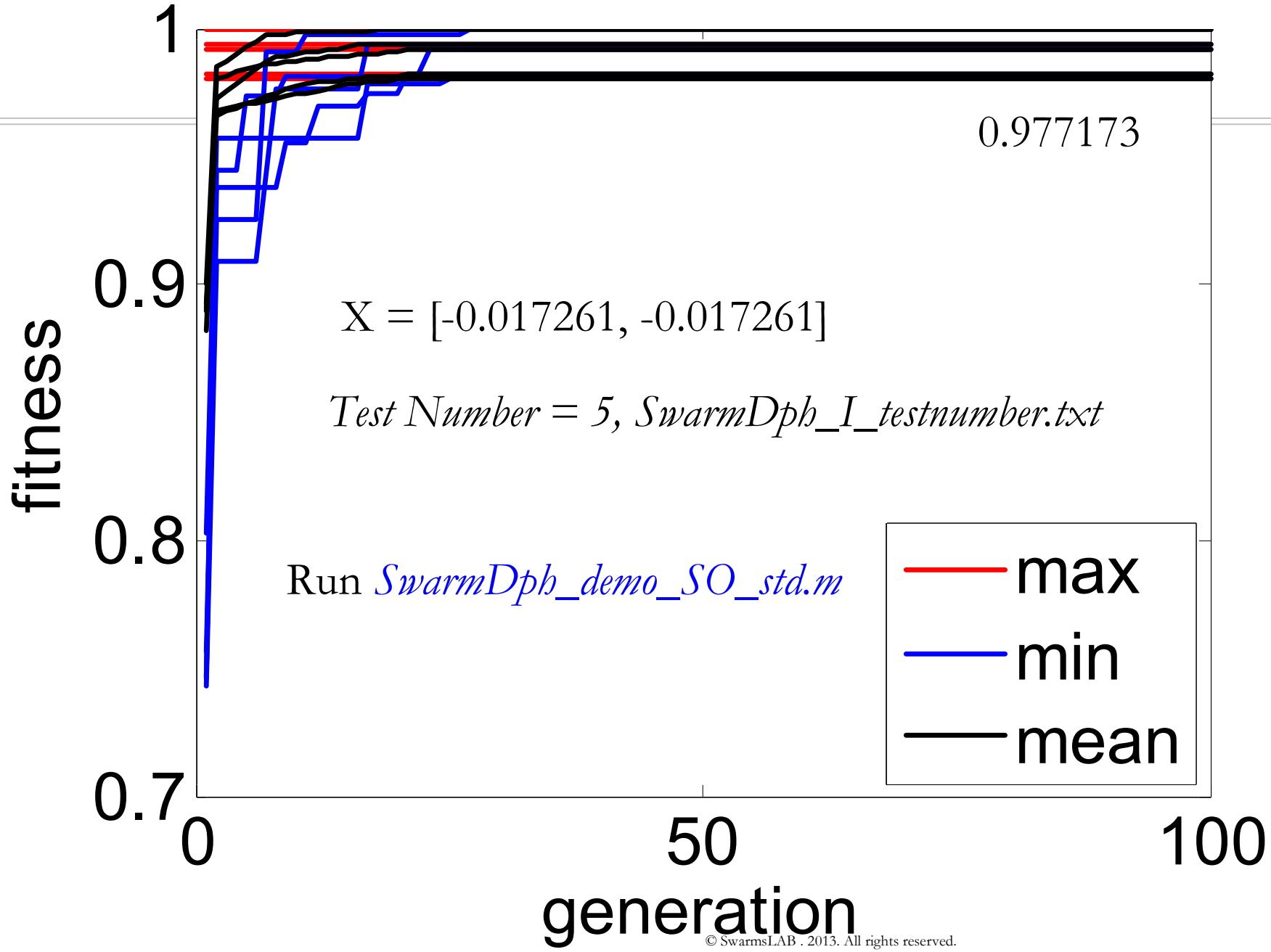
SGA_FITNESS_function.m

```
function [ fitness ] = SGA_FITNESS_function( x, y )

%SGA_FITNESS_function begin
%User can design their own fitness function here
%as a standard matlab function

  fitness = (sin(x)./(x+eps)).*(sin(y)./(y+eps));

%SGA_FITNESS_function end
```

Set parameters – **I**nput files (*SwarmDph_**I**_*)

Parameters	**Value**	**file**
Max Generation	*100*	*SwarmDph_I_max_generation.txt*
Crowd Factor	*0.618*	*SwarmDph_I_crowd.txt*
Population	*30*	*SwarmDph_I_population.txt*
Step	*0.01*	*SwarmDph_I_randomstep.txt*
Hz range	*20000* *500000*	*SwarmDph_I_fHz.txt*
Max Confines	*10* *10*	*SwarmDph_I_max_confines.txt*
Min Confines	*-10* *-10*	*SwarmDph_I_min_confines.txt*
Test Number	*10*	*SwarmDph_I_testnumber.txt*
Searching Try Number	*5*	*SwarmDph_I_try_number.txt*

fitness - generation



Solve and results – **O**utput files (*SwarmDph_**O**_**)

Results in 'Swarm*Dph*_O_***.txt**' ⟶ For Single Objective

Results	**Value**	**File**
$F(x_0)\|_{max}$	0.9909	Swarm*Dph*_O_maxfitness.txt
$F(x_0)\|_{min}$	0.060569	Swarm*Dph*_O_minfitness.txt
$F(x_0)\|_{mean}$	0.934436	Swarm*Dph*_O_meanfitness.txt
x_0	0.003696, 0.004362	Swarm*Dph*_O_best_result_space.txt
Cost time (sec.)	1.2350	In command window

Multi-objective Problem check '*SwarmDph_O*_MO*.mat'

To plot the Pareto Front see **FAQ 8 in SGALAB_FAQ_QuickStart_1.pdf**

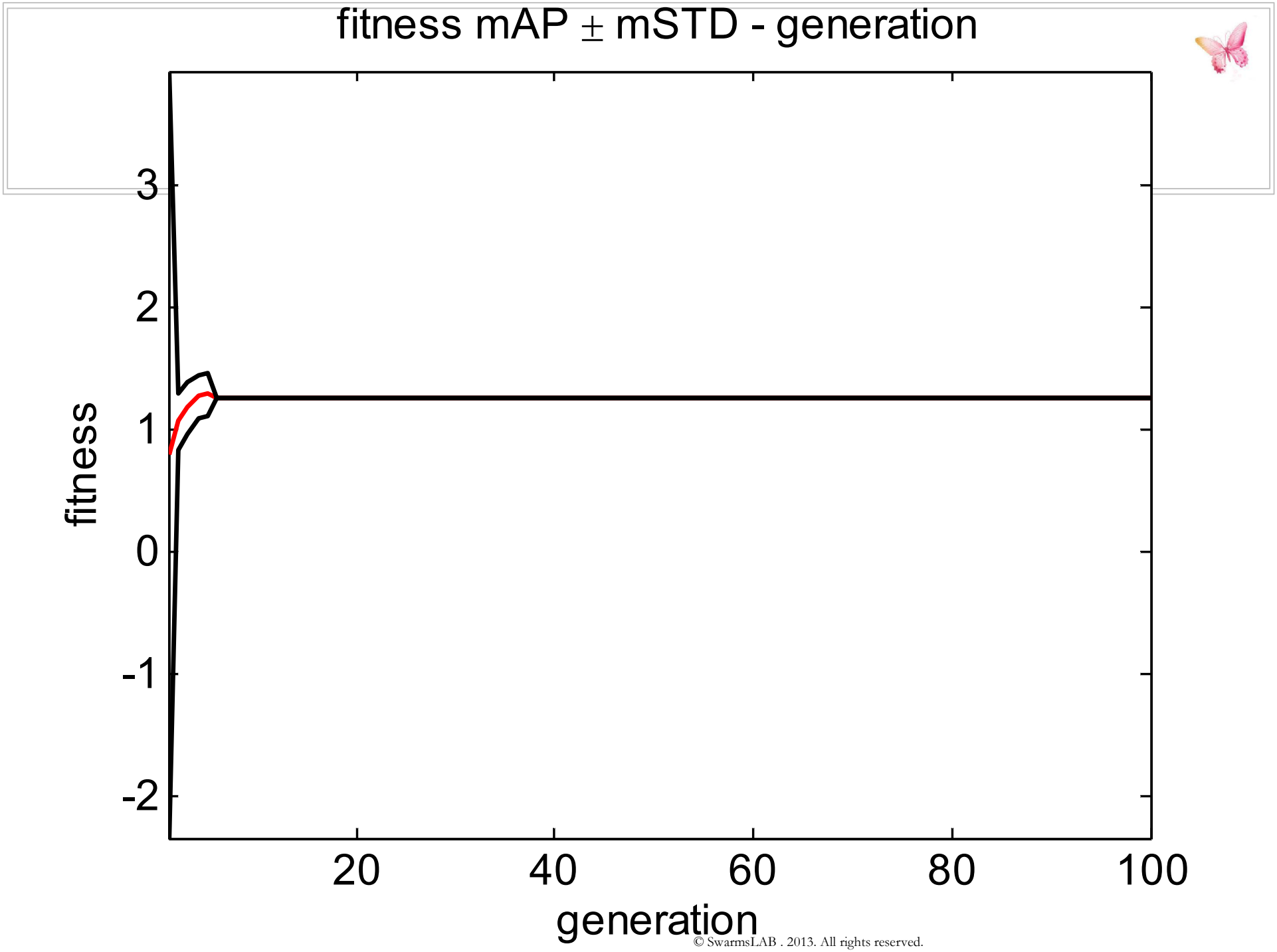
Case Study 2 – Multi-objective Problem

% 3 objectives SGA_FITNESS_function.m

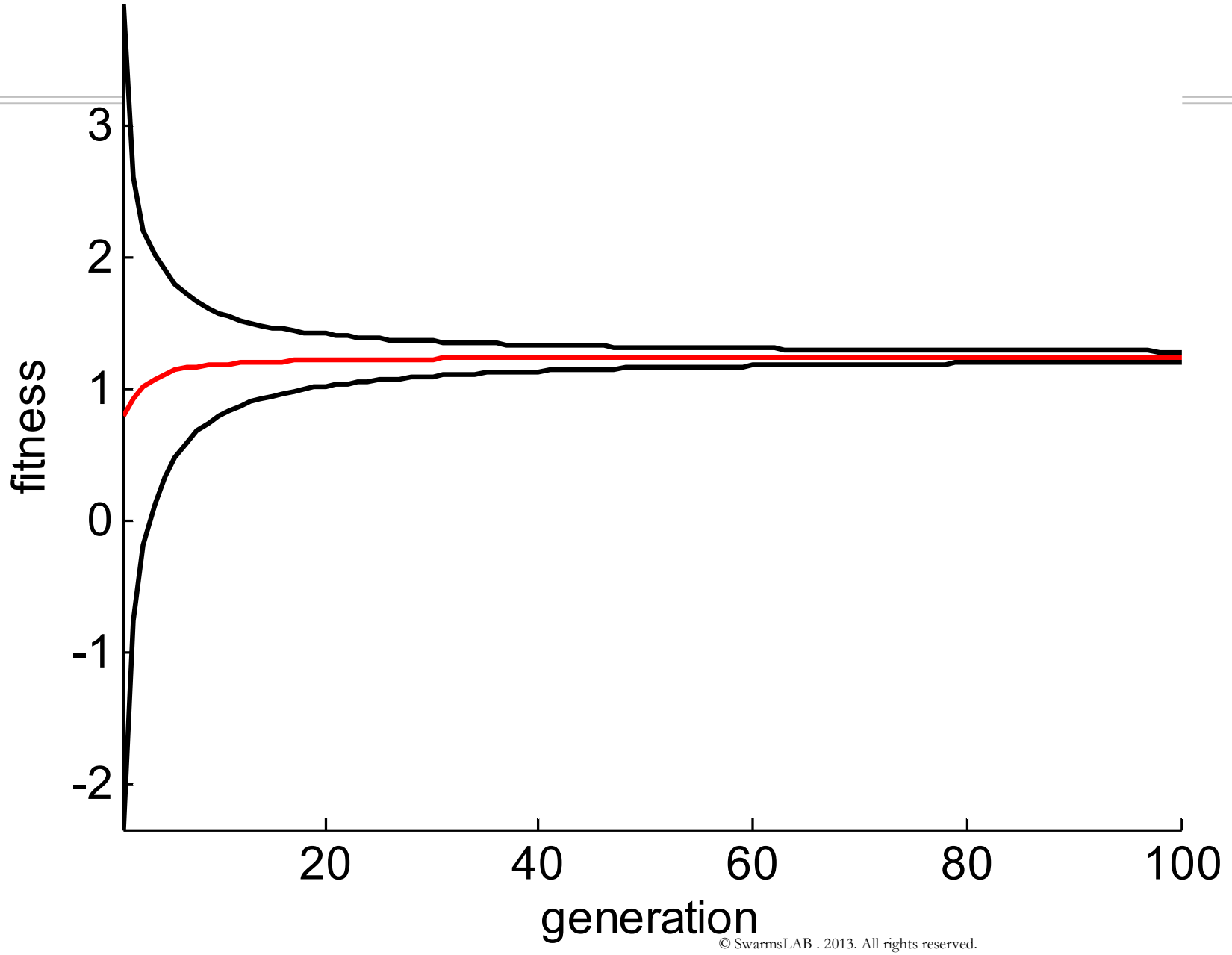
```
[ fitness ] = SGA_FITNESS_function(n, wc, H, va)
%n, wc, H, va
x = zeros(1,4);  x(1) = n; x(2) = wc; x(3) = va; x(4) = H;

%  minimize a multicomponent objective function.
objs = Rtotal_multi(x);

fitness(1) = 1./(objs(1) + eps);

fitness(2) = objs(2)*10;

fitness(3) = 1./(objs(3) + eps);
```

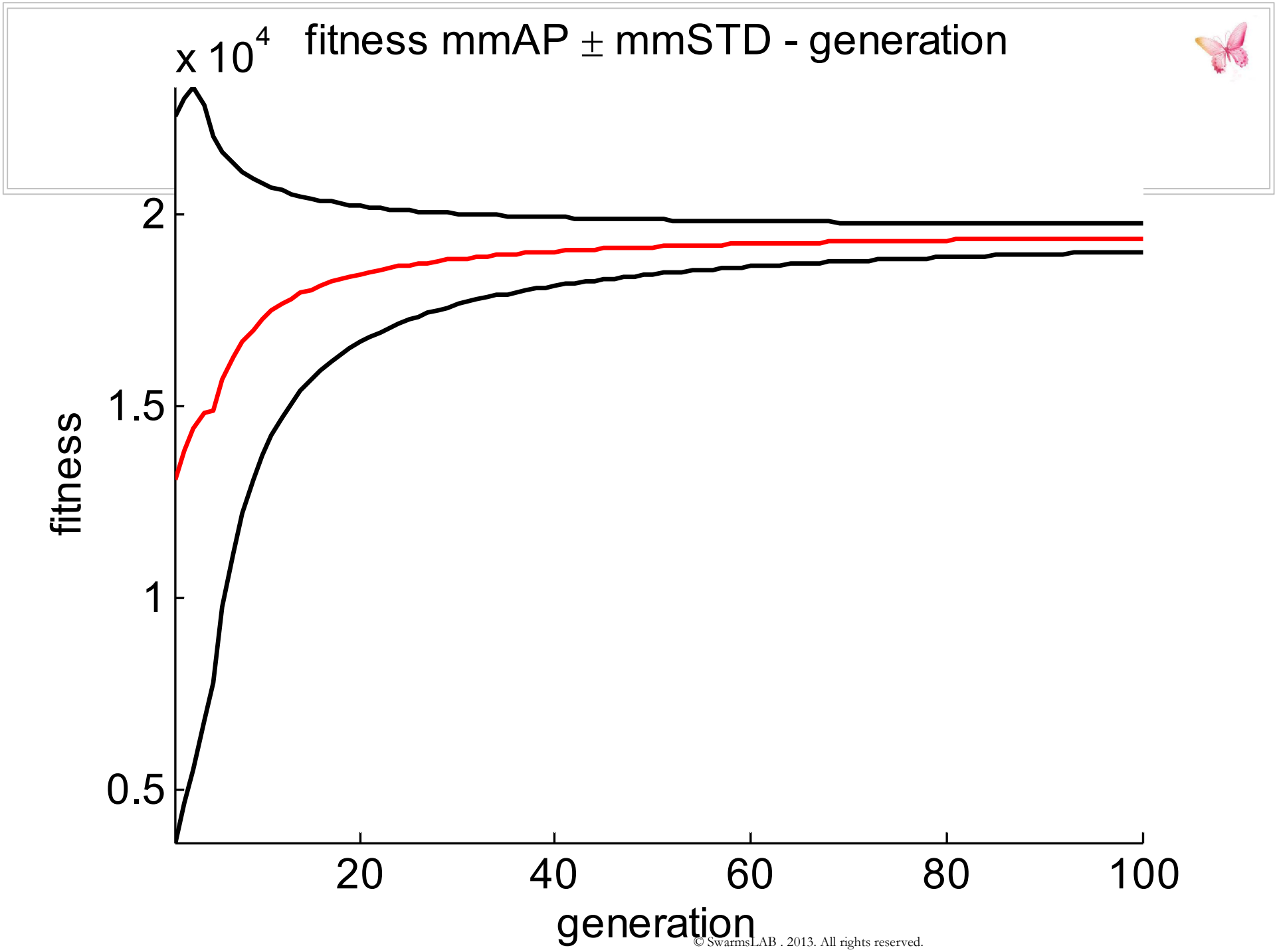
Case Study 2 – Multi-objective Problem

1. Check SGA_FITNESS_function.m
2. Set parameters – Input files (SwarmDph_I_*)
3. Run ‘SwarmDph_demo_MO_NSGAII.m’



fitness mmAP ± mmSTD - generation





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FAQ

1. Can handle single objective problems?

   YES

2. Can handle Multobjective problems ?

   YES

3. Where can I find .p files?

   via the skydrive link

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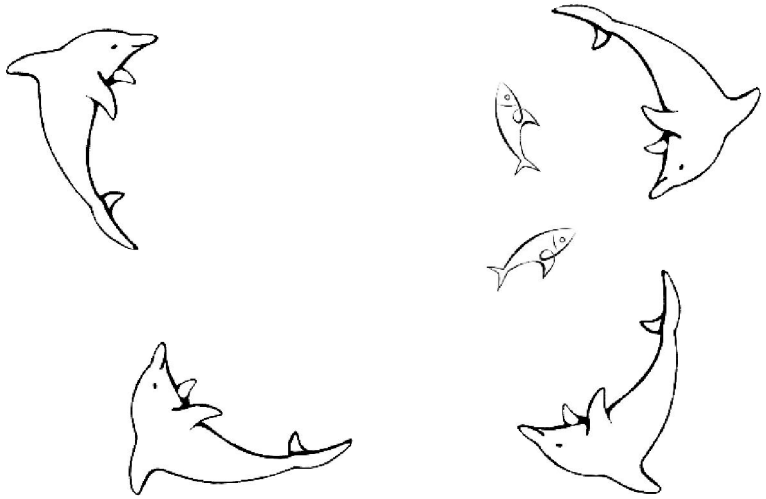
SxLAB Family Member



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END

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[卷珠帘.Scottish早春]

单衣薄袖拂垂柳。
飞花桥头，
初寒早春后。
杏花微雨黄藤酒，
尘缘往事牵谁手？

泪湿冷枕烛影瘦。
雪影初叠，
梦中红颜秀。
长烟归棹轻孤舟。
琵琶丝语泪痕旧。

2014-Feb-26, 词牌名“卷珠帘”是“蝶恋花”的别名，霍尊的歌曲《卷珠帘》，并不是按词牌来写词的。内容参考: [蝶恋花..金陵往事.Met You There] 和 [南乡子. Scottish Spring. Highland Mountains. Mount Hua]
LEO