Project Presentation --- Optimization Workshop

(During the last week of the course)

(1-3applies to all except the ant and harmony algorithms.)

1. Test your algorithm on the following functions.

function	Dimension D	domain	Min value
$f_1(x) = \sum_{i=1}^{D} x_i^2$	30	$[-5,5]^D$	$f_1(0) = 0$
$f_2(x) = 100(x_1^2 - x_2)^2 + (1-x_1)^2$ (Rosenbrock function)	2	$[-2,2]\times[-2,2]$	$f_2(1,1) = 0$
$f_3(x) = \sum_{i=1}^{D} \left[x_i^2 - 10\cos(2\pi x_i) + 10 \right]$ (Rastrigin function)	20	$[-5,5]^D$	$f_3(0) = 0$ (Multimodal)
$f_4(x) = 1 + \sum_{i=1}^{D} \frac{x_i^2}{4000} - \prod_{i=1}^{D} \cos\left(\frac{x_i}{\sqrt{i}}\right)$ (Griewank function)	30	$[-600,600]^D$	$f_4(0) = 0$ (Multimodal)

Do 10 runs for each function, and report the average minimum value obtained, including standard deviation.

2. For all the above functions, show a contour plot (this is a plot for D=2!)
3. For the Rosenbrock function
   a) in the contour plot, show the location of each of the "search agents" after each iteration, for the first 20 iterations. Combine all these 20 images to a "slide show ." (so that we can see how the agents move.) Use 20 agents.
   b) For the Rosenbrock function, sketch a graph to show how quickly the algorithm converges: (x-axis: iteration k, y-axis: value of the objective function), from iteration 5..100.

4. Submit your computer code **one day before the presentation** by e-mail. (eckart@sut.ac.th)

5. Each group will give a 12-15 minutes presentation (PowerPoint or similar). In this presentation, you should
   - Explain the algorithm
   - Display and discuss the above results (see below)
   - Slides in English, presentation can be in English or Thai

   After the presentation, you will be answering questions.

The grade will be made up of

- presentation,
- showing understanding
- being able to answer questions
- being able to explain the computer code.