

## AEM 685: Homework # 5

Due on 10/28/2015

Important: Please work independently.

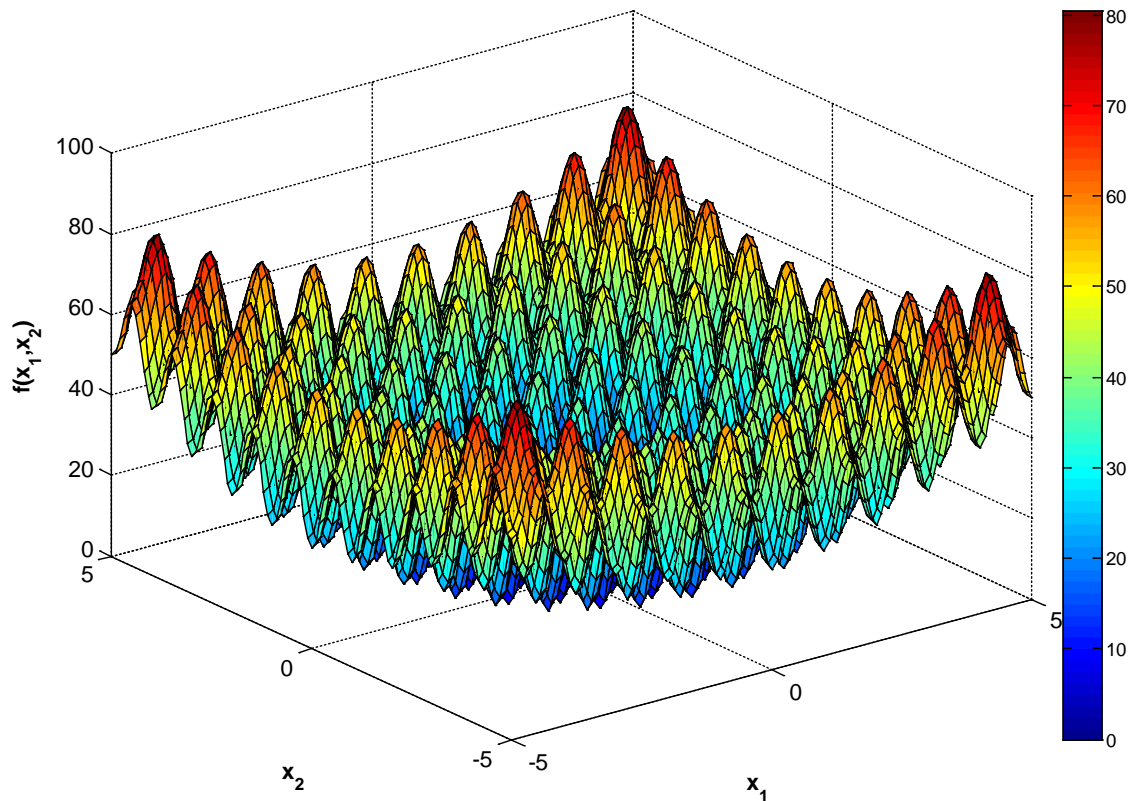
**Problem 1:** Minimize the optimization problem using ‘Genetic Algorithm’ (60 Points) and ‘Particle Swarm Optimization’ (40 Points). You have to write Matlab program. The function is called as ‘Rastrigin Function’.

$$\text{Minimize } f(x_1, x_2): 10 * 2 + (x_1^2 - 10 * \cos(2 * \pi * x_1)) + (x_2^2 - 10 * \cos(2 * \pi * x_2))$$

$$-5 \leq x_1 \leq 5$$

$$-5 \leq x_2 \leq 5$$

For your information, the function is plotted in Fig.1. The global minima is at (0, 0) which is 0.0. You have to define your own convergence criteria like number of iterations, change in design variables and change in objective function.



**Fig. 1: Rastrigin function in two dimensions**