

Consider the following problem:

$$\begin{aligned} & \text{minimize} && \cos(x_1) \sin(x_2) - \frac{x_1}{x_2^2+1} \\ & \text{subject to} && -1 \leq x_1 \leq 2 \\ & && -1 \leq x_2 \leq 1. \end{aligned} \tag{1}$$

Implement both global and local paradigm to solve problem (1). The global and local paradigms are described in section 3.1 and 3.2 in the discussion paper named PSO.pdf. In the implementation, use the following parameters accordingly:

Population size of 20 particles

Learning factor ACC-CONST = 2

Maximum velocity Vmax = 3

Set the stopping criteria number of iterations = 2000, run both paradigms for the following two things:

- record the first 100 iterations, do you observe any differences between the implementations of the two paradigms?
- are the solutions found after 2000 iterations different?

Submit your implementations and your observations of the above mentioned two points by 8,15, 8th of February to yue.y.zhou-kangas@jyu.fi with a subject TIES451\_exercise2\_yoursurname.