INF3490 exercises - week 6 2014

Problem 1

The particle swarm velocity update formula is

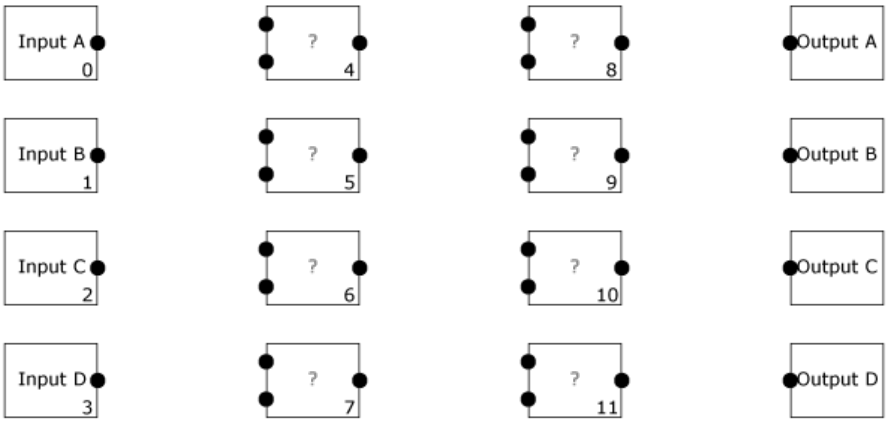
$$v_i^{(t+1)} \leftarrow \alpha v_i^{(t)} + U(0,\beta)\left(p_i - x_i^{(t)}\right) + U(0,\beta)\left(p_g - x_i^{(t)}\right)$$

If we replaced the random terms related to personal and global best with a term proportional to the local objective function gradient, like this:

$$v_i^{(t+1)} \leftarrow \alpha v_i^{(t)} + \gamma \nabla f\left(x_i^{(t)}\right)$$

How would the particles behave? How does this compare to gradient ascent?

Problem 2



Construct circuits from the Cartesian genetic programming genotypes below, using the setup above.

- 231 110 323 121 165 046 154 176 11 5 8 9
- 003 332 123 010 167 075 345 365 9 10 11 4

If the problem seems bit vague and you don't understand what you are supposed to do - take a look at this week's lecture (slides 7-9).
http://www.uio.no/studier/emner/matnat/ifi/INF3490/h14/lectures/inf3490-2014-pso-ehw-ho-1.pdf