“Evolutionary Computation”

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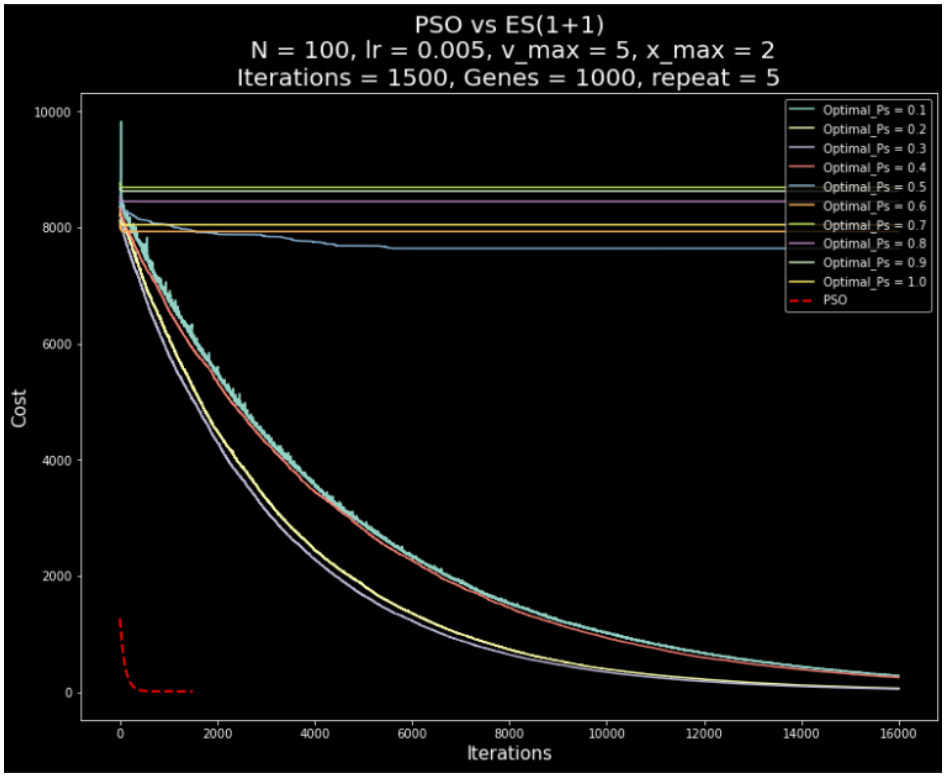
Homework 3

PSO comparison with ES(1+1):

Considering the following plots, PSO algorithms converge to the global minimum in considerably less number of iterations compared to ES(1+1) with even the optimal Ps value of 0.2. That is, PSO's cost suddenly drops with only few numbers of iterations (i.e. 700 iterations) from about 8000 and reaches less than 12. In contrast, the optimal ES(1+1) doesn't reach the cost less than 70 even after 13000 iterations. But it should be noted that PSO's numbers of iterations are not equal to its numbers of evaluations as against ES(1+1); therefore, by considering costs versus evaluations plot (second plot below) the situation will be reversed and we may say ES(1+1) outperforms PSO algorithm which is consistent with comparison of both algorithms runtime; in other words, ES(1+1) has much lower runtime when it comes to considering evaluations, the fact which is not explicit considering number of iterations!

“costs vs Iterations”



“Costs vs Evaluations”