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Algorithm A: Genetic Algorithm

Algorithm B: Particle Swarm Optimisation (PS)

Description of enhancement of Algorithm A:

*Describe the* ***enhancements*** *you have made to your algorithms in the two boxes. You can vary the sizes of these boxes but do not change the font (Calabri), font size (11), the paragraph properties (single space) or the header and footer, and everything should fit onto one side of A4. Do not embed images. You should type into this Word document and save it as a pdf. You may include a commentary on the relative success of your enhancements if you wish and* ***your submitted codes should be well commented****. However,* ***full explanations of enhancements should be provided here*** *with code comments used to show where and how the enhancements are made.*

***Save the final document as a pdf.*** *(You can delete all these instructions.)*

Individual initialisation (Tried NN but didn’t help with diversity) – Random generation is better

2-opt (Found that running 2opt fully meant diversity was harmed) Random chance of 2opt

Random chance of mutation

Switched from roulette selection to tournament selection and found it to be better for performance (speed) and for quality of parent selection

Tried implementing different crossover techniques including SCX and OX, OX was by far the best (probably due to its simplicity), SCX led to very quick convergence but didn’t lead to optimal solutions.

Implemented multiple mutation operators including RSM, PSM, THROAS, THRORS, swap and full-shuffle to help with genetic diversity. Added an annealing factor where if the longer the system went without a new solution, the higher the probability that the mutation is a full shuffle and potentially leads to a better tour

Implemented extinction

Implemented classical algorithmic restarts

Description of enhancement of Algorithm B:

Change of velocity function

2-opt

Varying inertia

Dazing

Nearest neighbour initialisation

Extinction events

Tried different topologies

Normalising velocity

Bounded proximity epsilon

***DESCRIPTION OF ALGORITHM ONLY IF THE ALGORITHM IS NOT COVERED IN LECTURES***

Description of *non-standard* Algorithm A:

*Describe any non-standard algorithms you have implemented that* ***have not been covered in lectures*** *(otherwise these boxes should be blank) You need to convince me that your implementation is indeed that of the named algorithm and you need to* ***provide a full reference to the source for your algorithm****. You should* ***include a pseudocode description****. You can vary the sizes of these boxes but do not change the font (Calabri), font size (11), the paragraph properties (single space) or the header and footer and everything should fit onto one side of A4. (You can delete these instructions.)*

***Remember: You need my express permission to implement a non-standard algorithm!***

Description of *non-standard* Algorithm B:

*Type here, as above.*