AS YMMETRIC TRAVELLING SALESMAN PROBLEM

PROJECT TITLE: Solution to ATSP using Ant colony system.

PROJECT GROUP:
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PROJECT PROPOSAL:

We propose to implement the paper based on the ‘Ant colony system’ titled “Ant colony system: A cooperative learning approach to the traveling salesman problem”.

About ACS:

This is a distributed heuristic algorithm that is applied to symmetric and asymmetric TSP. The main idea is that of having a set of agents called ants, searching in parallel for good solutions to the TSP.

Enhancements:

ACS can be augmented with local search techniques to obtain results that are comparable to some of the best performing algorithms using simulated annealing, evolutionary programming and genetic algorithms. We propose to implement ACS with local search (2-opt and 3-opt).

Experimental methodology:

Our basic idea would be to implement Ant colony system and compare them to the benchmarks provided by TSPLIB. Further we would augment our implementation with local search techniques such as 2-opt and 3-opt.

The cost (shortest tour) obtained by our implementations would be compared with results obtained from implementations using simulated annealing, evolutionary programming and genetic algorithms and other exact algorithms. Since we are not implementing the other algorithms we would not be in a position to make any time comparisons amongst them.

Time comparisons can be made between implementations of ACS, ACS with 2-opt and ACS with 3-opt. This will enable us to study the trade-off of time versus the solution quality when local search is augmented to the ACS algorithm.