Jarumas Chantapanich 2011: Solving the Traveling Salesman Problem with Gaussian Process Regression. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering , Department of Industrial Engineering. Thesis Advisor: Assistant Professor Juta Pichitlamken, Ph.D. 102 pages.

The traveling salesman problem (TSP) is a generalized form of the simple problem to find the smallest closed loop or distance from route that connects a number of points in a plane. We present a new heuristics method for solving TSP which is NP-hard. Given a small set of data, we first fit a Gaussian process regression function and then find a route that minimizes this regression function. The route is further transformed into a TSP tour. The numerical experiment shows that our approach can find a reasonably good solution. This method can predict an optimal solution which is higher than the optimal value by 1.4-13% when being experimented on test problems from TSPLIB (Bixby and Reinelt 1995). We expect our heuristics to improve if we use a more effective method for a tour construction.

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