



Thesis Defense

Computer Science Master's Program

“Empirical Comparison of Traveling Salesperson Approximation Algorithms”

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Abstract:

The traveling salesperson problem deals with optimizing the route a traveling salesperson might take to visit a set of places exactly once and return back to their starting point. The problem is NP-hard, and it is hard to approximate in general, but special cases have many approximation algorithms, which come with tradeoffs. In this thesis we compare the runtime, approximation ratio, and overall implementation complexity of two approximation algorithms for the Euclidean version of the problem, a classical 2-approximation algorithm and the multifragment heuristic. We run both algorithms on randomly generated point sets and real world data from TSPLib. We find that despite a worse theoretical approximation ratio of $O(\log n)$, the multifragment heuristic empirically outperforms the 2-approximation both in terms of runtime and in terms of route length.

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Time: 12:00 PM – 2:00 PM

Location: 14-257a

Committee: Dr. Daniel Frishberg, Dr. Ka Yaw Teo, Dr. Jonathan Ventura

