

FPT Algorithms for Line Cover and Minimum Bends TSP

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Abstract:

Problems like the Traveling Salesman problem (finding a tour of minimum cost on a set of n sites) have many applications; however, finding the best solution is computationally hard. It is one of those problems known to be NP-Complete. However, with the techniques of parameterized complexity, we have the potential of finding efficient and exact algorithms for NP-Complete problems. This talk shows progress we have made in geometric problems motivated by variants of the traveling salesman problem. In particular, we show new reduction rules for the problem of covering points with lines. This is useful when trying to find a tour with minimum bends. We will introduce our proof that the minimum bends TSP accepts a fixed-parameter tractable algorithm and also discuss the corresponding rectilinear variant.