The Traveling Salesman Problem with Road Distances

W. Cook[1]

Abstract: The traveling salesman problem is one of the most widely studied models in discrete optimization. Given n cities, the TSP asks for the shortest route to visit all of them and return to your starting point. Easy to state, but if $\mathcal{P} \neq \mathcal{NP}$ then no solution method can have good asymptotic performance as n increases to infinity. But this not mean it is impossible to solve large-scale examples. Indeed, following the work of Dantzig, Fulkerson, and Johnson (1954), we show that a certain tour of 49,603 sites in the United States is the shortest possible, measuring distance with point-to-point routes obtained from Google Maps. The talk is based on joint work with Daniel Espinoza, Marcos Goycoolea, and Keld Helsgaun.

[1] Combinatorics and Optimization Department
University of Waterloo
bico@uwaterloo.ca