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T G¨ P 2010

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The Gödel Prize 2010 is awarded to

S A J S.B. M

for their concurrent discovery of a polynomial-time approximation scheme (PTAS) for the Euclidean Travelling Salesman Problem (ETSP) :

- S. Arora. (1998). *Polynomial-time approximation schemes for Euclidean TSP and other geometric problems*, Journal ACM 45(5), 753-782.

- J.S.B. Mitchell (1999). *Guillotine subdivisions approximate polygonal subdivisions: A simple polynomial-time approximation scheme for geometric TSP, k-MST, and related problems*, SIAM J. Computing 28(4), 1298-1309.

The Euclidean Travelling Salesman Problem in dimension 2 is one of those old, seemingly innocent problems known to be NP hard, but still not known to be in NP. At the time of the publication, the impact of the Euclidean assumption was hardly understood: the best polynomial-time approximation scheme could only guarantee 50

Arora and Mitchell showed that solutions which are arbitrarily close to optimal in a relative sense can be found in polynomial time. These techniques, further simplified, improved and then generalized, occupy a chapter of their own in the theory of approximation algorithms.

The discovery of a PTAS for ETSP, with its long trail of consequences, counts as a crowning achievement of geometric optimization.

The Award Committee

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