

On the Cover Time of Planar Graphs

Johan Jonasson, *Chalmers University of Technology*
Oded Schramm, *Microsoft Research*

Abstract

The cover time of a finite connected graph is the expected number of steps needed for a simple random walk on the graph to visit all the vertices. It is known that the cover time on any n -vertex, connected graph is at least $(1+o(1))n \log n$ and at most $(1+o(1))(4/27)n^3$. This paper proves that for bounded-degree planar graphs the cover time is at least $cn(\log n)^2$, and at most $6n^2$, where c is a positive constant depending only on the maximal degree of the graph. The lower bound is established via use of circle packings.

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