DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
UNIVERSITY OF SOUTHERN DENMARK, ODENSE

COMPUTER SCIENCE COLLOQUIUM

Parameterizing the Permanent: Hardness for Fixed Excluded Minors

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IMADA's Seminar Room

Abstract:

In the 1960s, statistical physicists discovered a fascinating algorithm for counting perfect matchings in planar graphs. Valiant later showed that the same problem is #-hard for general graphs. Since then, the algorithm for planar graphs was extended to bounded-genus graphs, to graphs excluding $K_{3,3}$ or K_5 as a minor, and more generally, to any graph class excluding a fixed minor H that can be drawn in the plane with a single crossing. This stirred up hopes that counting perfect matchings might be polynomial-time solvable for graph classes excluding any fixed minor H. Alas, in this paper, we show #P-hardness for K_8-minor-free graphs by a simple and self-contained argument.

Joint work with Mingji Xia, Chinese Academy of Sciences, China

Host: Rolf Fagerberg