The University of Chicago

Departments of Computer Science,
Mathematics, and Statistics

Scientific and Statistical Computing Seminar

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Pfaffian Circuits

FRIDAY, January 6, 2012, at 3:30 PM

133 Eckhart Hall, 5734 S. University Avenue.

ABSTRACT

Pfaffian circuits are a new, geometrically motivated, and simplified construction of Valiant's holographic algorithms. Enabling efficient computation of certain partition functions, these algorithms exploit dual Spinor varieties to simulate some quantum computations classically, and provide a means to probe the classical-quantum boundary. Combinatorial problems addressed include planar NAE-SAT, lattice path problems and evaluation of certain Tutte polynomials. Basis change is one route to superposition-like effects, and some of the geometric considerations in analyzing Pfaffian circuits under arbitrary basis change will be discussed. Connections are made to the sum-product algorithm, SLOCC equivalent entangled states, and monoidal categories.

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