

abstract

COMPUTER SCIENCE/DISCRETE MATH I

Topic:

Speaker:

Affiliation:

Date:

Time/Room:

I will discuss a lower bound of $\Omega(n^{k/4})$ on the size of constant-depth AC_0 circuits solving the k -clique problem on n -vertex graphs. This bound follows from a stronger result that AC_0 circuits of size $O(n^{k/4})$ almost surely fail to distinguish between an Erdos-Renyi random graph G at the k -clique threshold and $G' = G \cup (\text{random } k\text{-clique})$. This lower bound is nearly matched by a recent construction of Amano of AC_0 circuits of size $O(n^{(k/4)+\text{const.}})$ which almost surely distinguish G from G' . I will also discuss a corollary in logic: strictness of the "variable hierarchy" for first-order logic on ordered graphs.