Abstract

Dynamic connectivity is one of the most fundamental problems in dynamic graph algorithms. We present a new randomized dynamic connectivity structure with $O(\log n(\log\log n)^2)$ amortized expected update time and $O(\log n/\log\log\log n)$ query time, which comes within an $O((\log\log n)^2)$ factor of a lower bound due to Pătraşcu and Demaine. The new structure is based on a dynamic connectivity algorithm proposed by Thorup in an extended abstract at STOC 2000, which left out some important details.