International Workshop On Combinatorial Algorithms
IWOCA

Element Uniqueness: a special case

Tetsuo Asano
JAIST, Japan
t-asano@jaist.ac.jp

17 April, 2012

Problem Given a read-only array containing n integers from the set $\{1, 2, \ldots, n\}$, determine whether it is a permutation of $(1, 2, \ldots, n)$, that is, whether there are any duplicate elements. Design an efficient algorithm which uses only $O(\log n)$ bits as its work space.

An $O(n \log n)$-time algorithm [1] is known. It uses $O(\log n)$ work space (more exactly, work space of $O(\log^2 n)$ bits). It is not known whether there is an algorithm which runs in $O(n \log n)$ time using only $O(\log n)$ bits.

References

[1] F. E. Fich and J. I. Munro and P. V. Poblete, "Permuting In Place," SIAM Journal on Computing, 24, pp.266-278, 1995.