

De Loof, Karel; De Meyer, Hans; De Baets, Bernard

Exploiting the lattice of ideals representation of a poset. (English) Zbl 1110.06001
Fundam. Inform. 71, No. 2-3, 309-321 (2006).

The authors demonstrate how some graph counting operations on the ideal lattice representation of a poset P can be used to count the number of linear extensions of P , the rank probabilities for every x of P , the mutual rank probabilities $\text{Prob}(x > y)$ for every (x, y) in P^2 , and to randomly generate a linear extension of P . They establish simple and fast algorithms for generating a random linear extension and deriving (mutual) rank probabilities of a poset. Since each of the mentioned problems is known to reside in the class $\#P$ -complete counting problems and since ideal lattice representation of a poset can be obtained in constant amortized time, the proposed approach favours the standard approach consisting in exhaustive enumeration of all linear extensions.

Reviewer: [Christoph Meinel \(Potsdam\)](#)

MSC:

[06A06](#) Partial orders, general
[06A07](#) Combinatorics of partially ordered sets
[06A05](#) Total orders
[68Q25](#) Analysis of algorithms and problem complexity
[68W05](#) Nonnumerical algorithms

Cited in **12** Documents

Keywords:

[random linear extension](#); [graph counting](#); [ideal lattice representation](#); [rank probabilities](#); [algorithms](#)