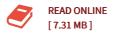




## The Volume of the Union of Many Spheres and Point Inclusion Problems (Classic Reprint) (Paperback)

By Paul G Spirakis

Forgotten Books, 2018. Paperback. Condition: New. Language: English . Brand New Book \*\*\*\*\*\*
Print on Demand \*\*\*\*\*\*. Excerpt from The Volume of the Union of Many Spheres and Point Inclusion
Problems The problem of estimating the area of the union of many circles in the plane was first
posed by [shamos, It is straightforward to solve this problem by an 0(n2) time deterministic
algorithm. We show here how to use Monte Carlo techniques (developed by [karp, Luby, 83] for
estimation of the failure probability of an n-component system) to get an 0(n) probabilistic
algorithm. This algorithm can trivially be extended to compute the volume of the union of n spheres
(or boxes, or any collection of n fixed description objects) in k dimensions, in time o(nk). The
accuracy of the algorithm is controlled by the algorithm implementer. Its running time is optimal in
the sense that 0(n) time is needed to compute the sum of n real-numbers, under quite general
models of computation. An application of this algorithm is a probabilistic 0(n) time method to test if
n given spheres have a nonzero measure intersection. This can also be extended to test for
intersections in k dimensions. No efficient algorithms for...



## Reviews

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-- Tobin Lesch

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