

**Flajolet, Philippe; Odlyzko, Andrew M.**

**Random mapping statistics.** (English) [Zbl 0747.05006](#)

Advances in cryptology - EUROCRYPT '89, Proc. Workshop, Houthalen/Belg. 1989, Lect. Notes Comput. Sci. 434, 329-354 (1990).

Summary: [For the entire collection see [Zbl 0719.00028](#).]

Random mappings from a finite set into itself are either a heuristic or an exact model for a variety of applications in random number generation, computational number theory, cryptography, and the analysis of algorithms at large. This paper introduces a general framework in which the analysis of about twenty characteristic parameters of random mappings is carried out: These parameters are studied systematically through the use of generating functions and singularity analysis. In particular, an open problem of Knuth is solved, namely that of finding the expected diameter of a random mapping. The same approach is applicable to a larger class of discrete combinatorial models and possibilities of automated analysis using symbolic manipulation systems ("computer algebra") are also briefly discussed.

**MSC:**

- [05A15](#) Exact enumeration problems, generating functions
- [60C05](#) Combinatorial probability
- [05C35](#) Extremal problems in graph theory

Cited in **1** Review  
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**Keywords:**

[Random mappings](#); [generating functions](#); [diameter of a random mapping](#)