

# A UNIFIED APPROACH TO LINEAR PROBING HASHING

**Alfredo Viola**

Universidad de la República, Uruguay  
viola@fing.edu.uy

We give a unified analysis of linear probing hashing with a general bucket size. We use both a combinatorial approach, giving exact formulas for generating functions, and a probabilistic approach, giving simple derivations of asymptotic results. Both approaches complement nicely, and give a good insight in the relation between linear probing and random walks. The Poisson Transform links in a natural way both approaches. A key methodological contribution, at the core of Analytic Combinatorics, is the use of the symbolic method (based on  $q$ -calculus) to directly derive the generating functions to analyze.

*Joint work with Svante Janson (Uppsala University, Sweden).*