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Asymptotics of conditional probabilities of succesful allocation of random number of particles into cells

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Abstract

© 2017 Walter de Gruyter GmbH, Berlin/Boston 2017. The article is devoted to the memory of Valentin Fedorovich Kolchin. Let ζ, ζ i (i N) be independent identically distributed nonnegative integer-valued random variables, (η i1 ,.., η iN) be the fillings of cells in the generalized scheme of allocation of ζ i particles into N cells, 1 ≤ i ≤ n, for fixed Z n = (ζ 1 , .., ζ n) these allocation schemes are independent. We consider the conditional probabilities P(A n,N | Z n) of the event A n,N = {each cell in each of n allocation schemes contains no more than r particles}, where r is some fixed number. The sufficient conditions for the convergence of the sequence P(A n,N | Z n) to a nonrandom limit with probability 1 are given. It is shown that the random variable ln P(A n,N | Z n) is asymptotically normal. Applications of the obtained results to the noise-proof encoding are discussed.

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Keywords

Cauchy integral, generalized allocation scheme, Hamming code

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