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Chaim Even-Zohar* (chaim@ucdavis.edu). *Patterns in Random Permutations.*

Every k entries in a permutation can have one of $k!$ different relative orders, called *patterns*. How many times does each pattern occur in a large random permutation of size n ? The distribution of this $k!$ -dimensional vector of pattern densities was studied by Janson, Nakamura, and Zeilberger (2015). Their analysis showed that some component of this vector is asymptotically multinormal of order $1/\sqrt{n}$, while the orthogonal component is smaller. Using representations of the symmetric group, and the theory of U-statistics, we refine the analysis of this distribution. We show that it decomposes into k asymptotically uncorrelated components of different orders in n , that correspond to representations of S_k . Some combinations of pattern densities that arise in this decomposition have interpretations as practical nonparametric statistical tests. (Received January 24, 2019)