Lehmer code transforms and Mahonian statistics on permutations

Vincent Vajnovszki (Université de Bourgogne)

In 2000 Babson and Steingrímsson introduced the notion of vincular patterns in permutations. They shown that essentially all well-known Mahonian permutation statistics can be written as combinations of such patterns. Also, they proved and conjectured that other combinations of vincular patterns are still Mahonian. These conjectures were proved later: by Foata and Zeilberger in 2001, and by Foata and Randrianarivony in 2006.

In this paper we give an alternative proof of some of these results. Our approach is based on permutation codes which, like Lehmer's code, map bijectively permutations onto subexcedant sequences. More precisely, we give several code transforms (i.e., bijections between subexcedant sequences) which when applied to Lehmer's code yield new permutation codes which count occurrences of some vincular patterns.