

## PERMUTATION PATTERNS AND THE MÖBIUS FUNCTION

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Einar Steingrímsson

Reykjavik University

A permutation is separable if it can be generated from the permutation 1 by successive sums and skew sums or, equivalently, if it avoids the patterns 2413 and 3142. Using the decomposition into sums and skew sums, we give a formula for the Möbius function of an interval  $(q, p)$  in the poset of separable permutations ordered by pattern containment. This formula computes the Möbius function for such intervals in polynomial time.

A consequence of the formula is that the Möbius function of such an interval  $(q, p)$  is bounded by the number of occurrences of  $q$  as a pattern in  $p$ . The formula also implies that for any separable permutation  $p$  the Möbius function of  $(1, p)$  is either 0, 1 or  $-1$ , in addition to allowing straightforward computation of the Möbius function for many interesting special cases. The formula of Sagan and Vatter for the Möbius function of layered permutations is a special case of our formula.

We also present some results for the Möbius function of non-separable permutations.

*This is joint work with Alex Burstein, Vít Jelnek and Eva Jelínková.*