

# Unbalanced Wilf-equivalence

*Alexander Burstein*, Howard University, Washington, DC – 20059

## Abstract

A *pattern* is an equivalence class of permutations over a totally ordered alphabet under an order isomorphism. A permutation  $S$  avoids a pattern  $P$  if it has no subsequence order-isomorphic to  $P$ . Two sets of patterns,  $T_1$  and  $T_2$ , are Wilf-equivalent if, for each  $n$ , they are avoided by same number of permutations of length  $n$ . A *Wilf-equivalence* of sets of patterns  $T_1$  and  $T_2$  is balanced if, for each  $k$ ,  $T_1$  and  $T_2$  contain the same number of patterns of size  $k$ . We will consider some of the smallest cases of unbalanced Wilf-equivalence, and their generalizations to infinite families of unbalanced Wilf-equivalences, as well as some conjectured Wilf-equivalences that are still open problems.

**Keywords:** permutation, pattern, Wilf-equivalence.