

On parking functions with no peaks or valleys, and no ties oh my!

Matt McClinton

University of Wisconsin - Milwaukee

Based on joint work with Ari Cruz, Pamela E. Harris, Kimberly J. Harry, Jan Kretschmann, Alex Moon, John O. Museum, and Eric Redmon

Recall that $\alpha = (a_1, a_2, \dots, a_n) \in [n]^n$ is a parking function if its nondecreasing rearrangement $\beta = (b_1, b_2, \dots, b_n)$ satisfies $b_i \leq i$ for all $1 \leq i \leq n$. In this joint work, we study some discrete statistics on parking functions. As in permutations, we say the parking function α has a peak at index i if $a_{i-1} < a_i > a_{i+1}$, a valley at index i if $a_{i-1} > a_i < a_{i+1}$, and a tie at index i if $a_i = a_{i+1}$. In this talk we will show that the set of all parking functions with no peaks and no ties are enumerated by the Catalan numbers, while the set of parking functions with no ties and no valleys are enumerated by the Fine numbers. We provide open problems for future work.

References

- [1] Pamela E. Harris et al. On some discrete parking functions. Preprint, [arXiv:2312.16786 \[math.CO\]](https://arxiv.org/abs/2312.16786).