

1106-05-2371 **Elizabeth Y. Yang*** (eyang@princeton.edu), 44 Birch Drive, Plainsboro, NJ 08536. *A study of competition graphs induced by permutations*. Preliminary report.

We introduce a means to unite two active areas of research: the study of competition graphs and the study of permutation patterns. We extend the work of Cho, Kim on competition graphs of doubly partial orders on points in \mathbb{R}^2 . The competition graphs of permutations use the doubly partial order on the permutation's graphical representation. This has interesting enumerative implications as well; each edge in the competition graph corresponds to an instance of a 123 or a 132 pattern within the permutation.

We find ways to characterize which types of graphs can be competition graphs of certain collections of permutations. More interesting patterns arise when considering the competition graphs of permutations avoiding the pattern 132 (and similarly, 123). This motivates us to restrict our study to paths and stars. We will demonstrate some structural and enumerative results for these classes of competition graphs.

For example, we can produce bijections between permutations that produce paths and permutations that produce stars and a recurrence relation to compute these numbers quickly. Some analogous results were produced for sets of permutations avoiding the pattern 132 (and similarly, 123).

This was joint work with Brian Nakamura. (Received September 16, 2014)