How Permutations Displace Points and Stretch Intervals

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July 20, 2007

For a permutation $\pi \in S_n$, we define $d(\pi) = \sum_{i=1}^{n} \frac{|i-\pi(i)|}{n}$ which we call the *displacement* of π. We consider the questions: for which π is $d(\pi)$ maximized and what is the maximum value $d(\pi)$ can take for $\pi \in S_n$? We also consider the *normalized displacement* $d(\pi)/n$ and compute the expected value of $d(\pi)/n$ as n approaches infinity. Time permitting, we will generalize the question of displacement to the stretching of intervals over the numbers $\{1, \ldots, n\}$ for the specific intervals $\{i, i+1\}$. This is joint work with Petr Vojtěchovský.