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*Generalized parking function*

The "classical" parking functions of length $n$ is counted by the formula $(n+1)^{n-1}$. They corresponds bijectively to the standard Young tableaux (SYT) of skew-shape $\alpha + 1^n/\alpha$, where $\alpha$ is any partition under $\lambda = (n-1, \ldots, 2, 1)$. There is a natural symmetric group action on these parking functions, where the orbit is counted by the Catalan number $1/(n+1)\binom{2n}{n}$. The Frobenius character of this action over all SYT of shape $\alpha + 1^n/\alpha$ is given by the skew Schur function $s_{(\alpha+1^n/\alpha)}(\mathbf{x})$. In this talk we generalize this notion to any partition $\lambda$ and study the combinatorics of the generalized parking function by relating them to non-crossing lattice paths. This is a joint work with François Bergeron and Yan Lanciault.