Fixed Points of Parking Functions

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Abstract

We define an action of words in $[m]^n$ on $\mathbb{R}^m$ to give a new characterization of rational parking functions—they are exactly those words whose action has a fixed point. We use this viewpoint to give a simple definition of Gorsky, Mazin, and Vazirani's zeta map on rational parking functions when m and n are coprime, and prove that this zeta map is invertible. A specialization recovers Loehr and Warrington's sweep map on rational Dyck paths. This is joint work with Jon McCammond and Hugh Thomas.