Vertical Split Encoding: Enabling Larger N-Tuples for Stronger 2048 Play

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Abstract

N-tuple networks are a simple yet efficient approach to developing computer players for the game 2048, but the tuple size has been limited to six or seven due to the memory constraints. In this study, we break through this limitation by proposing a novel encoding method called Vertical Split Encoding (VSE). VSE enables us to design N-tuple networks with 8-tuples or even 9-tuples. We confirm through experiments that the performance degradation resulting from applying VSE is reasonably small, and that the newly developed 8-tuple networks significantly outperform the 6-tuple baseline, which was used in the state-of-the-art computer player, under the same experimental setting.

Keywords: 2048; N-tuple networks; Encoding