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The Orthogonal Colouring Game

The Orthogonal Colouring Game is a combinatorial game in which two players alternately colour vertices of a pair of isomorphic graphs while respecting the properness and the orthogonality of the colouring. Each player aims to maximise her score, which is the number of coloured vertices in the copy of the graph she owns.

An involution σ of a graph G is strictly matched if its fixed point set induces a clique and any non-fixed point $v \in V(G)$ is connected with its image $\sigma(v)$ by an edge.

In this talk, we introduce the game and our main result that the second player has a strategy to force a draw in this game for graphs that admit a strictly matched involution.

This is joint work with Stephan Dominique Andres, Fionn Mc Inerney, and Richard J. Nowakowski.