NICHE HYPERGRAPHS OF PRODUCTS OF DIGRAPHS

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Abstract

If $D = (V, A)$ is a digraph, its niche hypergraph $NH(D) = (V, E)$ has the edge set $E = \{e \subseteq V \mid |e| \geq 2 \land \exists v \in V : e = N^-_D(v) \lor e = N^+_D(v)\}$. Niche hypergraphs generalize the well-known niche graphs and are closely related to competition hypergraphs as well as common enemy hypergraphs. For several products $D_1 \circ D_2$ of digraphs $D_1$ and $D_2$, we investigate the relations between the niche hypergraphs of the factors $D_1$, $D_2$ and the niche hypergraph of their product $D_1 \circ D_2$.

Keywords: niche hypergraph, product of digraphs, competition hypergraph.

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