Gregarious hypergraph designs

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A subhypergraph $\mathcal{H}$ of a given hypergraph is said to be gregarious with respect to a fixed vertex partition if the vertices of $\mathcal{H}$ belong to mutually distinct vertex classes. For graphs, this notion was introduced in the context of edge decomposition more than two decades ago, but its hypergraph generalization was first considered as late as in 2023, and only to the extent of just one theorem on 3-uniform hypergraphs. We begin the systematic study of gregarious decompositions of hypergraphs, with focus on complete n-partite r-uniform hypergraphs. Beyond their gregarious decompositions, a new approach is also offered and a related parameter introduced, expressing the gregarious decomposability of the blowups of a hypergraph.

References

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[3] Zs. Tuza, *Gregarious decompositions of complete equipartite graphs and related structures*, Symmetry **15**:12 (2023), paper 2097, 14 pp.