

Towards Rota's conjecture for gain-graphic matroids

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Rota's famous conjecture for representable matroids says that when F is a finite field, there are only finitely many minimal obstructions for the class of matroids that are linearly-representable using vectors with F as the field of scalars. A proof has been announced by Geelen, Gerards, and Whittle.

Gain-graphic matroids are analogues to matroids represented by vectors: instead of representing the matroid using numbers from a field, we use elements from a group. In order to represent a matroid using group elements, we require an intermediate object known as a gain-graph. Multiple theorems show us that finite-field-representable matroids and finite-gain-graphic matroids play symmetric roles in structural matroid theory: if we want to understand the structure of minor-closed families of matroids, we must understand both representable and gain-graphic classes. So it is natural to seek an analogue of Rota's conjecture for gain-graphic matroids: when H is a finite group, there are only finitely many minimal obstructions for the class of H -gain-graphic matroids.

In this talk I will outline our intended path towards Rota's conjecture for gain-graphic matroids. This is joint work with Daryl Funk.

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