

عنوان مقاله:

Enumerating word maps in finite groups

محل انتشار:

فصلنامه تئوری گروهی، دوره 13، شماره 3 (سال: 1403)

تعداد صفحات اصل مقاله: 12

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خلاصه مقاله:

We consider word maps over finite groups. An n -variable word w is an element of the free group on n -symbols. For any group G , a word w induces a map from $G^n \mapsto G$ where $(g_1, \dots, g_n) \mapsto w(g_1, \dots, g_n)$. We observe that many groups have word maps that decompose into components. Such a decomposition facilitates a recursive approach to studying word maps. Building on this observation, and combining it with relevant properties of the word maps, allows us to develop an algorithm to calculate representatives of all the word maps over a finite group. Given these representatives, we can calculate word maps with specific properties over a given group, or show that such maps do not exist. In particular, we have computed an explicit A_Δ such that only generating tuples are nontrivial in its image. We also discuss how our algorithm could be used to computationally address many open questions about word maps. Promising directions of potential applications include Amit's conjecture, questions of chirality and rationality, and the search for multilinear maps over a group. We conclude with open questions regarding these problems.

کلمات کلیدی:

Word maps, relatively free groups, Algorithms on groups, Amit--Ashurst conjecture

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