

Permutation groups and transformation semigroups

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Abstract

In collaboration with João Araújo and others, I have been thinking about relations between permutation groups and transformation semigroups. In particular, what properties of a permutation group G on a set Ω guarantee that, if f is any non-permutation on Ω (or perhaps any non-permutation of rank k), then the transformation semigroup $\langle G, f \rangle$ has specified properties.

There is far too much to summarise in a short talk, but I will try to say a little about two topics:

Synchronization: for example, what are the *non-synchronizing ranks* of a permutation group, the ranks k for which $\langle G, f \rangle$ is non-synchronizing for some element f of rank k ?

Regularity: for example, which permutation groups G have the property that, for any element f of rank k , f has a quasi-inverse in $\langle G, f \rangle$?