

Embeddable Group Actions on Surfaces

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Finite group actions on closed orientable surfaces via homomorphisms is a widely studied topic in group theory and low dimensional topology. It is closely related to symmetries of surfaces and branch coverings. The celebrated Riemann-Hurwitz formula is the main tool for their description. Some of the surfaces symmetries arise as rigid rotations of ambient space, which may be visualized explicitly. They correspond to finite subgroups of the special linear group $SO(3)$, which are cyclic, dihedral, alternating and symmetric. We provide an explicit description of signatures for the latter. More precisely, we describe possible signatures of actions and determine which of them correspond to embeddable actions. All this leads to the complete classification of all embeddable actions on surfaces.