Conjugacy problem for subgroups with applications to Artin groups and braid type group.

(English summary)


Let $H$ be a subgroup of a group $G$ and let $\varphi: G \to K$ be a homomorphism from $G$ to another group $K$, such that $H = \varphi^{-1}(K')$ for a finite subgroup $K'$ of $K$. Moreover, assume that the following conditions are satisfied:

1. Given $x, y \in G$, it is possible to decide whether $x$ and $y$ are conjugate in $G$ and, if they are, to compute an element $c \in G$ satisfying $x^c = y$; this is referred to as the explicit conjugacy problem.
2. For every $x \in G$, the centraliser $C_G(x)$ of $x$ in $G$ is finitely generated and can be computed.
3. Given elements $d_1, \ldots, d_k \in K$ and $b \in K$, it is possible to decide whether $b$ is contained in the subgroup of $K$ generated by $d_1, \ldots, d_k$ and, if it is, to express $b$ as a word in $d_1, \ldots, d_k$.

The author shows that under the above conditions, there is an algorithm which for given $x, y \in H$ decides whether $x$ and $y$ are conjugate in $H$ and, if they are, computes an element $c \in H$ satisfying $x^c = y$. The algorithm, in the worst case, involves one test for membership in $\varphi(C_G(x))$ for every element of $K'$.

The above result is used to obtain solutions to the explicit conjugacy problem in some groups, in particular in the affine Artin groups of types $\tilde{A}_n$ and $\tilde{C}_n$. 

Reviewed by Volker Gebhardt

References


Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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