Erratum

A family of polycyclic groups over which the uniform conjugacy problem is NP-complete

[Int. J. Algebra Comput., Vol. 24, No. 4 (2014) 515–530,
 DOI: 10.1142/S0218196714500234]

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Published 17 May 2017

In [1] we attempted to construct a family of polycyclic groups, $\{G_n\}$, such that the uniform conjugacy problem over the $\{G_n\}$ NP-Complete. Unfortunately, it was brought to our attention by the Board that our construction detailed in **Section 6** of [1] is flawed in that the maps we use to extend G_i to obtain G_{i+1} are not automorphisms which in turn implies that the twisted subset problem (described in **Section 7** of the same paper) we obtain following conjugation is trivial. For instance, when we extend G_1 to G_2 we have the following problem which we describe in the notation given in **Section 6** of [1].

Consider the following words given by the generators of G_2 :

$$g_1 g_2 (g_1 g_3) g_2^{-1} g_4^{-1} = g_2 g_4 (g_1 g_3) g_4^{-1} g_2^{-1}$$

which are equivalent as elements of G_2 since g_2 and g_4 commute. Further applying the relations of G_2 we then have:

$$\begin{aligned} g_4 g_2 (g_1 g_3) g_2^{-1} g_4^{-1} &= \\ g_4 g_1^{-1} (g_2 g_3 g_2^{-1}) g_4^{-1} &= \\ g_4 g_1^{-1} (g_1^{-1} g_3) g_4^{-1} &= \\ g_1^2 g_3 & \end{aligned}$$

and

$$\begin{aligned} g_2 g_4 (g_1 g_3) g_4^{-1} g_2^{-1} &= \\ g_2 (g_1^{-1} g_3) g_2^{-1} &= \\ g_1 (g_2 g_3 g_2^{-1}) &= \\ g_1 (g_1^{-1} g_3) &= g_3 \end{aligned}$$

which in turn implies that $g_1^2 = 1$ since the original words were equivalent as elements of G_2 . Since $g_1^2 = 1$ the twisted subset sum problem we obtain above g_1 following conjugation (as seen in **Theorem 6.2** from [1]) is then trivial. Hence the paper's main result, **Theorem 8.4**, is incorrect.

To the best of our knowledge, the remaining content of the paper is valid including the results in **Section 8** that show that the twisted subset sum problem is NP-Complete.

The authors would like to thank the Editorial Board for bringing our attention to the fact that the construction in Section 6 of [1] is incorrect and does not imply the paper's main result.

Reference

- [1] B. Cavallo and D. Kahrobaei, A family of polycyclic groups over which the uniform conjugacy problem is NP-complete, *Int. J. Algebra Comput.* **24**(4) (2014) 515–530.