

## Permutation Groups in Varieties of Semigroups

Andrzej Kisielewicz, Institute of Mathematics, University of Wrocław, Poland.

### ABSTRACT

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One of the reasons for studying varieties (equational classes) of semigroups are their applications in computer science.

In [2], in spite of skepticism of many authors dealing with the topic before, I have succeeded to give the full description of varieties of commutative semigroups. This result was subsequently applied for solving various problems, in particular, those arising in computer science (see [1,3]).

In [4], an attempt was made to extend the results of [2] onto noncommutative semigroups. In the lattice of varieties of commutative semigroups the description is based on a kind of a “skeleton” which is provided by Schwabauer classes. In case of noncommutative semigroups a similar role may be played by “permutability classes”. i.e. those defined by permutation identities  $x_1x_2 \dots x_n = x_{\sigma(1)}x_{\sigma(2)} \dots x_{\sigma(n)}$ . With every such a class, an infinite sequence  $(G_2, G_3, G_4, \dots)$  of permutation groups is connected that determines the class uniquely ( $G_n$  is just the invariance group of the operation  $x_1x_2 \dots x_n$  in the class). In [4], I got a description of such sequences, which not only generalizes a number of old results on permutability conditions in semigroups, but also opens an interesting area of research in permutation groups on its own.

### References

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- [3] Unification in commutative semigroups, *J. Algebra*, 200 (1998), 246-257.
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**Contact Address:** `kisiel@math.uni.wroc.pl`