

OBERSEMINAR ZUR ALGEBRA UND ALGEBRAISCHEN KOMBINATORIK

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Groups with context-free co-word problem

A group G , finitely generated over a set X , has soluble word problem if there exists a terminating algorithm to recognise whether or not any given word represents the identity, that is, if the set $W(G, X)$ of words over X representing the identity element can be recognised by a halting Turing machine.

The word problem is not soluble for all groups; but when it is it may often be solved on a restricted type of Turing machine.

It is well known and elementary to prove that elements from the set $W(G, X)$ can be recognised by a finite state automaton (a computer with bounded memory) precisely when G is finite.

Muller and Schupp's classic 1983 result that $W(G, X)$ can be recognised by a pushdown automaton (a finite state automaton with added stack) precisely when G is virtually free, and that in that case the pushdown automaton may be assumed to act deterministically, is highly non-trivial.

In either of the above situations, an automaton can be found which halts on all input, that is, which recognises both $W(G, X)$ and its complement (known as the co-word problem). In fact there are many groups for which the co-word problem is recognised by a pushdown automaton (i.e. is context-free), but the word problem itself is not. I shall describe recent work with Holt, Röver and Thomas to explore this family of co-context-free groups.

Alle Interessierten sind herzlich eingeladen.