

Computer algebra and rewriting

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Rewriting is the study of computation based on applying rewrite rules, being syntactic descriptions of how to replace a term by another term. Many kinds of computations, both by human and by computers are instances of rewriting. For instance, rewriting can be seen as the major vehicle for computation in tools like Mathematica. Theory of rewriting is used in typical computer algebra issues, for instance regarding finitely presented groups or Groebner bases. On the other hand techniques for automatically proving properties of rewriting systems can be seen as instances of computer algebra. In this presentation first an overview of relations between computer algebra and rewriting will be given. Then a number of examples will be given how algebraic techniques are applied for automatically proving termination of rewriting systems.