Involutive Bases and Solving Polynomial Systems

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In this talk we give a brief overview of basic ideas, concepts and constructive methods behind the algorithmic approach to construction of involutive polynomial Janet bases which are (generally redundant) Groebner bases of the special form.

Then we present software which, given a polynomial system: (i) computes its degree-reverse-lexicographical Janet basis; (ii) extracts from the last the reduced Groebner basis; (iii) converts this basis into the pure lexicographical one used for finding the roots. We illustrate efficiency of our software by a number of examples that are well-known as benchmarks for Groebner bases software.