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Erratum note

In 2002, the third author has presented the algorithm DisPGB to compute a comprehensive Gröbner system for a parametric ideal in Montes (2002), and has implemented it in Maple. The first release (1.4 of 2002) contains some errors that were fixed in the second release (2.4 of 2004). The two first authors have also implemented this algorithm in Maple, and after testing on several examples, they have also found some other errors in the two sub-algorithms NewCond and NewVertex used in DisPGB. The NewCond algorithm receives, as input, a polynomial \( f \) and two sets of null and non-null conditions, and it returns the whole set \( C \) of (irreducible) factors of the first non-null (w.r.t the given conditions) coefficient of \( f \). But, this makes an error in the output of DisPGB algorithm. To fix this minor error, it shall return the first element of \( C \). Now, if NewCond finds a new condition \( c \), then NewVertex is called to create two new branches by adding \( c = 0 \) and \( c \neq 0 \) to the sets of null and non-null conditions, respectively. In the latter case, NewVertex substitutes every polynomial \( g \) in the basis by the S-polynomial of \( f \) and \( g \). But, if the leading coefficient of \( f \) has a non-decidable factor (w.r.t the given conditions), the output of DisPGB may be false. Therefore, before performing this S-polynomial, using NewCond, we have to be sure the leading coefficient of \( f \) has no new condition.
The DisPGB algorithm for computing a disjoint reduced comprehensive Gröbner system has been reformulated and improved (without errors) the first time in Manubens and Montes (2006). It has been transformed and named BuildTree in Montes and Wibmer (2010), and is now the first step of the GrobCov algorithm for obtaining the canonical Gröbner cover for a parametric ideal, described in Montes and Wibmer (2010), and implemented in Singular in the library grobcov.lib (http://www-ma2.upc.edu/~montes/) (cgsdr routine).

References