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CoCoA

CoCoA is a system for doing **Co**mputations in **Co**mmutative **A**lgebra, whose members are: Lorenzo Robbiano (team leader), Gianfranco Niesi and Antonio Capani (authors), John Abbott, Anna Bigatti, Massimo Caboara, Martin Kreuzer, David Perkinson and occasionally other researchers and students. It is *public domain* software, and can be obtained by anonymous ftp from

http://cocoa.dima.unige.it

as well as from the two mirrors
http://www.physik.uni-regensburg.de/~krm03530/cocoa/distribute. html
http://www.reed.edu/cocoa/distribute.html

The architecture of CoCoA 3 is designed to offer flexibility through *efficiency*, *portability* and *programmability*. It runs on the following platforms: Unix (SunOS, Solaris, Digital Unix) Macintosh (MacOS), and PC (DOS, Windows95, Linux). Most of the code is platform independent; the kernel is written in the C language and a library is written in CoCoAL, the high–level language of the system. With our system we basically do operations over commutative rings of polynomials. For example we may compute *Gröbner bases, syzygies and minimal free resolutions, intersections and divisions, inclusion and equality tests, elimination of indeterminates, homogenization of ideals, Poincaré series and Hilbert functions, factorization of polynomials and toric ideals.* In addition, the capabilities of the system and the flexibility of its use are greatly enhanced by the *high-level original programming language* CoCoAL which allows the user to code his own algorithms in a straightforward way. Most of the algorithms implemented in CoCoA are new and have proved to be very efficient.

Among the various items of documentation of the system a complete *on-line manual* is included in the new release 3.4 (March 1998).

Currently CoCoA is used by researchers in *several countries.* Most of them are Commutative Algebraists and Algebraic Geometers, but also people working in different areas like Analysis and Statistics have already benefitted from our system.

CoCoA is also used as the main system for *teaching* advanced courses in several Universities. Besides Italy, the most intensive use is by Tomas Recio at the University of Santander (Spain), Anthony Geramita at the Queen's University (Canada) and Martin Kreuzer at the University of Regensburg (Germany).

It is mentioned in some of the most used *text books* on Computational Algebra.