

# CoCoALib

	2017-9				2017-10				2017-11				2017-12				2018-1				2018-2							
	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7	8			
CoCoA																												
CoCoALib																												
MinPolyQuot not documented																												
New function IsInSymbols																												
CoCoALib releases on redmine																												
CoCoALib - CoCoALib-0.99850																												
Release CoCoALib 0.99850																												
CoCoALib - CoCoALib-0.99880																												
Matrix equation solving; linear (...)																												
Improve threadsafety																												
Matrix equation solving: LinKer																												
Printing polynomials - spaces between (...)																												
Play with GIT																												
Error: ERR::NotNonZero instead (...)																												
Elim(vector<long>) as PPOrderingCtor																												
Syzygy for modules: non-homogeneous (...)																												
Error codes: use same code for (...)																												
LongRange: in which file should (...)																												
Impl small non-prime finite fields (...)																												
DistrMPolyClean does not use MemPool (...)																												
MatrixOrderingMod32749Impl: test (...)																												
Update normaliz interface?																												
Better errors: give supplementary (...)																												
SLUG: elimination																												
Test whether a symbol is in a ring																												
DivMask: extend interface?																												
Implement "elim" in CoCoALib																												
Cleanup MinPoly code																												

**CoCoA**

<p>implicit, ImplicitHypersurface: (...)</p> <p>Redesign ideals</p> <p>LinSolve for matrices over FFp</p> <p>strict enum types: C++11 extension</p> <p>New function: cardinality of finite (...)</p> <p>FlagManager for bool/bool3 flags</p> <p>MachineInt or long for args which (...)</p> <p>Separate configure scripts for (...)</p> <p>MachineInt: change semantics?</p> <p>IsRadical for ideal?</p> <p>New function: multiplicity and (...)</p> <p>Improve saturate</p> <p>Slug: Polynomial ring constructor (...)</p> <p>Revive code for SelfSaturating (...)</p> <p>SLUG: factorization of <math>x^{9999}</math></p> <p>Separate install script for CoCoALib?</p> <p>Canonical homomorphism for (some) (...)</p> <p>interval arithmetic</p> <p>Clean up SparsePolyOps-MonomialIdeals</p> <p>Naming convention mistakes</p> <p>IsZeroDet: new fn</p> <p>New function: SubmoduleOfGBasis</p> <p>Frobby version number</p> <p>factor SEGV -- too large characteristic</p> <p>C++14: Use type auto where appropriate</p> <p>New function: MinPoly for pseudo-zero-dimensional (...)</p> <p>Ideals with trivial GBasis</p> <p>Tidy CoCoALib test directory</p> <p>Determinant &amp; Inverse of matrix (...)</p> <p>Factor of multivariate sometimes (...)</p> <p>exgcd over integers (ZZ)</p> <p>PrimaryDecomposition: a interesting/pathological (...)</p> <p>C++14: use the new for loop syntax (...)</p> <p>ideal ctor where given gens are (...)</p>	
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TmpLDP uses srand and time  
 RingID counter increased inside (...)  
 Type ideal for ZZ[x[1..n]]  
 GlobalManager: create SignalWatcher (...)  
 Oddly slow GBasis computation (slow (...)  
 Make class RingElemVector?  
 RadicalZeroDim with extra parameter (...)  
 Remove flag IhaveGBasisValue?  
 DenseMatrix: use template impl (...)  
 HNF: Hermite Normal Form  
 Start using C++14 "move" capability  
 What is the difference between (...)  
 mul(MAT,MAT,MAT)  
 Simple syntax for making a quotient (...)  
 Doc for normaliz fns  
 Documentation for SparsePolyOps?  
 Better test for univariate-ness (...)  
 Unexpectedly slow example with (...)  
 gfan does not "deinitialize"  
 Default ctor for rings  
 Doc for module term orderings  
 matrix.H and MatrixView.H  
 ker\_H needs care  
 Use noexcept  
 DynamicBitset missing arg checks  
 cmp for machine integers  
 Detect updated versions of external (...)  
 Clean time.C  
 Documentation for PrimaryDecomposition  
 Unused variables, params, data (...)  
 NR for polys with coeffs in PID  
 interreduce: make monic if over (...)  
 rref slower than expected (maybe) (...)  
 Improve CertifyNotPower

txt2tags: problem with filenames (...)  
geobucket: documentation  
Compilation on Windows: problems (...)  
GBasis over ZZ: port to CoCoALib  
Generalize prim  
Review File subtree hierarchy  
Build also dynamic/shared library (...)  
Review examples  
release-source script: use shell (...)  
Unsigned long for indexes (& sizes?)  
IsIrred in ZZ[x,y]  
RingBase::mySwap needed?  
Shell scripts: Shebang line, etc  
Threadsafety, multithreading: optional (...)  
Symlink directory for external (...)  
ProgressReporter: prepare for new (...)  
Development releases?  
ProductBigInt (also ProductBigRat???)  
DivAlg in CoCoALib  
Crufft in ExtLibs-Normaliz.C  
ApplySPRCodomain: relax power/exponent (...)  
FactorINT: funny order  
Clean TmpGOperations, and remove (...)  
Homogenization of an ideal with (...)  
Suggestion about Graded polynomial (...)  
MinGens gives non minimal gens (...)  
MinGens could be faster  
Implement Truncated GBases for (...)  
Implement GBMill (aka Groebner (...)  
July 2023  
IdealOfPoints: allow duplicate (...)  
deg(f) is slow if f is long  
gcd(f,f) is slow  
Verbosity messages: avoid printing (...)

<p> <b>VerificationLevel: just 3? Low, (...)</b>  <b>Homogenizer</b>  <b>Make CoCoALib test file for radical</b>  <b>Iterator design: compatible with (...)</b>  <b>CpuTimeOut: arg of type ErrorContext?</b>  <b>Use ErrorContext instead of string (...)</b>  <b>myFinalizeGBasis ("Final clean (...)</b>  <b>Computing in sub polyring</b>  <b>Conversion from SmallPrime to UNSIGNED (...)</b>  <b>BuildInfo</b>  <b>Error codes: "Not..." for "blah (...)</b>  <b>New constructor for PolyRing with (...)</b>  <b>Make ex-syz.C</b>  <b>Check include guards</b>  <b>Documentation: indexXX.html should (...)</b>  <b>CoCoALib - CoCoALib-0.99900</b>  <b>Redmine Administration</b>  <b>Design new errors using inheritance</b>  <b>Which names to use? Intersection/saturation (...)</b>  <b>New function: IdealWithIncrementalGBasis(l, (...)</b>  <b>Documentation: translation table</b>  <b>New class: exterior algebra</b>  <b>ideal: does const ourGetPtr really (...)</b>  <b>Create PolyOps-RingElem?</b>  <b>Move to C++14 (skipping C++11)</b>  <b>subresultant</b>  <b>HilbertDriven Buchberger Algorithm</b>  <b>Filling matrix row/col from a vector</b>  <b>GFan: port CoCoA_5 functions into (...)</b>  <b>Adjoin indets to a poly ring</b>  <b>Get indexed indets from a polyring</b>  <b>Idea for for loops</b>  <b>Extended rationals: PlusInfinity (...)</b>  <b>submat of a submat</b> </p>	
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<p> <b>SLUG: Printing PPs with many indets</b>  <b>Convenient RingHom pseudo-ctors</b>  <b>Factorization in <math>K(a,b)[x,y]</math></b>  <b>ElimMat is slow</b>  <b>Sparse matrix (SparseMat)</b>  <b>Coding guidelines</b>  <b>Signal handler not portable?</b>  <b>Intersection of Ideals: has GBasis?</b>  <b>Implement monic0(f) for the case (...)</b>  <b>Add LM to cocoalib ?</b>  <b>MachineInt: chase through ULL (...)</b>  <b>Documentation: a good model to (...)</b>  <b>swap for new classes</b>  <b>Random and threadsafe?</b>  <b>Suggestion: Add "JumpTo" function (...)</b>  <b>Use C++ attributes</b>  <b>Finalize design for ideals in CoCoALib</b>  <b>Code &amp; doc structure: one-big-file (...)</b>  <b>Add flag IhaveHomogGensValue (...)</b>  <b>Add function IsHomog3(l)?</b>  <b>Add new function for IsInRadical (...)</b>  <b>Add a function CleanupGens making (...)</b>  <b>Tidying ideal generators (for non-polynomial (...))</b>  <b>Improve trivial operations with (...)</b>  <b>Use long long (at least sometimes)?</b>  <b>Release CoCoALib 0.99900</b>  <b>Some tests have become slower</b>  <b>Ensure tests do not need too much (...)</b>  <b>JSON and UUID</b>  <b>CoCoALib - CoCoALib-1.0</b>  <b>Sort out RingElem, RefRingElem, (...)</b>  <b>List of all functions in CoCoALib</b>  <b>printing polynomials</b>  <b>keywords in documentation</b> </p>	
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<p>Cleanup header for ring classes (...)</p> <p>Error Codes</p> <p>automatic creation of all function (...)</p> <p>Introduce PartialHom</p> <p>Ideals of polynomials</p> <p>LT over QQ: surprisingly slow</p> <p>IdealOfPoints with generic coeffs</p> <p>New datastructures directory</p> <p>Convert DUPFF code to C++</p> <p>Better GCD</p> <p>Design problem in ideals</p> <p>Convenience ring ctors and homs</p> <p>Buchberger-Moeller (parent task)</p> <p>    Buchberger-Moeller: fast modular (...)</p> <p>    Buchberger-Moeller: impl via (...)</p> <p>Buchberger-Moeller: input conversions</p> <p>Makefile dependencies</p> <p>RingOf rather than owner? (and (...))</p> <p>Iterated CanonicalHom</p> <p>GCD normalization (e.g. monic)</p> <p>Convert old "task table" into redmine</p> <p>IsStdGraded: add for PPOrdering, (...)</p> <p>PPWithMask needs checking</p> <p>Example for change of coordinates (...)</p> <p>HilbertBasis from Normaliz: full-lattice (...)</p> <p>Generator for random ring elements</p> <p>Documentation for QBGenerator needs (...)</p> <p>No test for QBGenerator</p> <p>Approx QIR</p> <p>Transcribe C4 code for GCD in QQ[x]</p> <p>Multivariate lifting</p> <p>Move the various &lt;matrix&gt;::mySetEntry (...)</p> <p>Forward declarations</p> <p>Eliminate class RefPPMonoidElem?</p>	
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Store unique copy of FF(p) in GlobalManager  
 Global setting: to use IsProbPrime (...)  
 PrimeField -- new fn?  
 Modules design: brainstorming  
 Compilation on M\$Windows: Visual (...)  
 FreeModule: unique copy?  
 Add doc for ApproxPts2  
 submodule constructor different (...)  
 C++ nasty surprises  
 Why is DMPI slower than DMPClean?  
 Module homs  
 Missing documentation and tests (...)  
 CoCoAServer: what future, what (...)  
 Resolution/morse: integrate Mario (...)  
 add resolution data type  
 implement algorithm(s) for resolutions  
 PPMonoidElemAlias: redesign PPMonoidElem (...)  
 add myHilbertSeries member field (...)  
 add myJBMill member field to ideal  
 NewFreeModule of dimension 0  
 Minimal syzygies (optimized implementation)  
 Allow user to give a name to a (...)  
 Error names and error messages (...)  
 Semantics of IsPrintedWithMinus  
 Improve UPoly eval at BigRat for (...)  
 MemPool: order free blocks?  
 Polynomial multiplication (product (...)  
 Port RealRoots to C++  
 Eigenvectors  
 Which sets of generators in an (...)  
 LinearSimplify: port to CoCoALib  
 Unique copies of rings -- smart (...)  
 Clang: automatic bug finding  
 Documentation: write doc for RingDenseUPolyClean



Quick/correct flag for bool3 fns  
 Fn to "flatten" multiple polynomial (...)  
 Make squarefreefactor work in multiple (...)  
 FloatStr uses too much memory  
 Functions to clean up a factorization  
 elim using RingTwinFloat triggers (...)  
 add myResolution member field (...)  
 Reconsider overloaded virtual mem (...)  
 Subrings  
 Temporary file for experimentation  
 FloatApprox for TwinFloat values?  
 Documentation for ReductionCog  
 Allow use of RingElem instead of (...)  
 Split SparsePolyRing.H into two (...)  
 Investigate using cmake for configuration  
 New function for printing with (...)  
 Implement gin (generic initial (...)  
 Problem with template instantiation (...)  
 configure: check all libraries (...)  
 Redesign CRTMill  
 Wikipedia  
 Gaussian integer and rationals (...)  
 Complex twin-floats  
 Shadow CoCoA namespace to help (...)  
 What is test-Dynamic1.C  
 Buchberger-Moeller: add option (...)  
 Unique copies of free modules?  
 Optimized algorithms for implicitization (...)  
 Laurent polynomials  
 Integrate Janet/Pommaret basis (...)  
 factor: multivariate + finite characteristic  
 Matrix determinant over multivariate (...)  
 Credits to CoCoALib contributors  
 Accumulator (like a geobucket)

MemPool: make it easier to get (...)  
 PPMonoid: add fn to check for overflow (...)  
 Use DivMask inside QBGenerator  
 myAddMul in poly rings  
 PolyAlgebraHom (PolyRingHom) evaluate (...)  
 Fault tolerant rational reconstruction: (...)  
 Remove cruft from test files  
 Add more operations between modules (...)  
 Example database: Slow ideal equality (...)  
 Noncommutative algebra "of solvable" (...)  
 Betti numbers, betti diagram  
 Extend homomorphism to polynomial (...)  
 Addition of sparse (multivariate) (...)  
 View PP exponent vector (and order (...)  
 Problem with GBasis in tower of (...)  
 Investigate using Boost.build instead (...)  
 configure: have option to say to (...)  
 GlobalManager: initialization compatible (...)  
 ExternalLib-CDD: (needed by GFan)  
 CoCoALib cone  
 PPMonoid with 1 extra "exponent"?  
 CRTMill::myAddInfo accept modulus (...)  
 Makefile: problem not seeing when (...)  
 GroebnerFan/ExternalLib-GFan: improve (...)  
 threadsafety: Scott Meyers's advice (...)  
 finite fields: global register (...)  
 Remove refcounts from RingElem?  
 No doc for DistrMPolyInIFpPP  
 Clean code for DistrMPolyClean  
 SmallFpImpl: make it faster  
 vector of "indets" in each PPMonoid?  
 PPOrdering: use it to compute WDeg?  
 Alg Extn by non-zero dim ideal  
 FastCmp for degree -- useful?

PPMonoid pseudo-ctor without explicit (...)  
 GenRepr in CoCoALib?  
 F5 with 3 args?  
 Sparse matrices  
 MachineInt: function for checking (...)  
 Generalize grading matrix  
 UIBC: need include file in RingWeyl.C  
 Make Mario's new code threadsafe  
 factor is very slow on some simple (...)  
 Differential algebra  
 SparsePolyIter: make more compatible (...)  
 GINV: alex basis  
 NewPolyRing: tidy up the many different (...)  
 PPMonoidSparse: comparisons are (...)  
 IsIrred: correct design?  
 SmallFpImpl: different repr for (...)  
 bool3: add some logical operations?  
 factor: too slow on largish multivariate (...)  
 Impl faster multiplication for (...)  
 DistrMPolyInIPP::myPushFront and (...)  
 IsIrred3: fast 3-way irred test (...)  
 myIsEqual, myCmp: direct comparisons (...)  
 SmallFpDouble: which impl of InvMod (...)  
 External libraries: keep copy of (...)  
 Read input from SymbolicData database  
 New function: quorem for univariate (...)  
 Hilbert Driven GBasis  
 Design GBMill  
 Fn to read symbol range (SymbolRange)  
 Documentation: check layout of (...)  
 Printing TwinFloat as (rational) (...)  
 LinDepMill: Mill for linear dependencies  
 Slow NF example  
 Weights in ElimMat?

ex-PolyIterator  
 QIR/RealRootRefine: improve behaviour (...)  
 GFan: require version newer than (...)  
 GCD: add special case if args are (...)  
 Poly ring homomorphism to change (...)  
 C++11: Mario's Hilbert scheme code  
 GlobalManager: name of object in (...)  
 RowMat, ColMat with arg an empty (...)  
 New "LF" function which is based (...)  
 JanetBasis gives error indet index (...)  
 GroebnerFan: slow examples  
 Printing ring for ideals (or just (...)  
 GroebnerFan: ERROR: Matrix must (...)  
 Slug: MakeTermOrd (rk calls in (...)  
 invalid pointer in "free"  
 WEB SITE: HTML is not clean!  
 Ctors for exceptions/errors  
 Pseudo-zero-dim ideals  
 Better printing of negative coeffs  
 SqFreeFactor: should it work over (...)  
 Organize better the documentation (...)  
 mySquare and myPowerSmallExp  
 New fn: transform ideal with ring (...)  
 Printing for RingElem  
 Clean up revised RatReconstructByContFrac (...)  
 Upper bound for value of poly in (...)  
 Matrix rank is slow (over QQ)  
 Non-standard DegRevLex (NonStdDegRevLex, (...)  
 New function: Threadsafe RandomLinearForm (...)  
 exgcd; solve Bezout equation  
 Make a poly ring QQ[x,y,z] also (...)  
 Ideal equality  
 Ideal Ops: sort-cuts for trivial (...)  
 Port old "clever" code for matrix (...)

<p>Improve RealRoots: compute sqfr (...)</p> <p>Improve RootBound</p> <p>All PPs of given wdeg</p> <p>gcd: low degree but big coeffs (...)</p> <p>RandomUnimodularMat is slow with (...)</p> <p>French students' example with GFan</p> <p>Create two separate radical fns (...)</p> <p>DynamicBitset::lamAll1s</p> <p>Unified Gaussian reduction impl</p> <p>Benchmarks?</p> <p>C++17: notes about updating</p> <p>slimgb: Brickenstein, singular</p> <p>Clean out OLD CODE?</p> <p>CoCoALib - removed/duplicates</p> <p>CoCoALib: ideas for student projects</p>	
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