

# CoCoALib

	2024-11				2024-12				2025-1					2025-2				2025-3				2025-4					
	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
CoCoA																											
CoCoALib	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																											

**implicit, ImplicitHypersurface: (...)**  
**Redesign ideals**  
**LinSolve for matrices over FFp**  
**strict enum types: C++11 extension**  
**New function: cardinality of finite (...)**  
**FlagManager for bool/bool3 flags**  
**MachineInt or long for args which (...)**  
**Separate configure scripts for (...)**  
**MachineInt: change semantics?**  
**IsRadical for ideal?**  
**New function: multiplicity and (...)**  
**Improve saturate**  
**Slug: Polynomial ring constructor (...)**  
**Revive code for SelfSaturating (...)**  
**SLUG: factorization of  $x^{9999}$**   
**Separate install script for CoCoALib?**  
**Canonical homomorphism for (some) (...)**  
**interval arithmetic**  
**Clean up SparsePolyOps-MonomialIdeals**  
**Naming convention mistakes**  
**IsZeroDet: new fn**  
**New function: SubmoduleOfGBasis**  
**Frobby version number**  
**factor SEGV -- too large characteristic**  
**C++14: Use type auto where appropriate**  
**New function: MinPoly for pseudo-zero-dimensional (...)**  
**Ideals with trivial GBasis**  
**Tidy CoCoALib test directory**  
**Determinant & Inverse of matrix (...)**  
**Factor of multivariate sometimes (...)**  
**exgcd over integers (ZZ)**  
**PrimaryDecomposition: a interesting/pathological (...)**  
**C++14: use the new for loop syntax (...)**  
**ideal ctor where given gens are (...)**

**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  
Threaddafety, 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 (...)

VerificationLevel: just 3? Low, (...)  
Homogenizer  
Make CoCoALib test file for radical  
Iterator design: compatible with (...)  
CpuTimeOut: arg of type ErrorContext?  
Use ErrorContext instead of string (...)  
myFinalizeGBasis ("Final clean (...)  
Computing in sub polyring  
Conversion from SmallPrime to UNSIGNED (...)  
BuildInfo  
Error codes: "Not..." for "blah (...)  
New constructor for PolyRing with (...)  
Make ex-syz.C  
Check include guards  
Documentation: indexXX.html should (...)  
CoCoALib - CoCoALib-0.99900  
Redmine Administration  
Design new errors using inheritance  
Which names to use? Intersection/saturation (...)  
New function: IdealWithIncrementalGBasis(l, (...)  
Documentation: translation table  
New class: exterior algebra  
ideal: does const ourGetPtr really (...)  
Create PolyOps-RingElem?  
Move to C++14 (skipping C++11)  
subresultant  
HilbertDriven Buchberger Algorithm  
Filling matrix row/col from a vector  
GFan: port CoCoA\_5 functions into (...)  
Adjoin indets to a poly ring  
Get indexed indets from a polyring  
Idea for for loops  
Extended rationals: PlusInfinity (...)  
submat of a submat

<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 lhaveHomogGensValue (...)</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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Cleanup header for ring classes (...)  
Error Codes  
automatic creation of all function (...)  
Introduce PartialHom  
Ideals of polynomials  
LT over QQ: surprisingly slow  
IdealOfPoints with generic coeffs  
New datastructures directory  
Convert DUPFF code to C++  
Better GCD  
Design problem in ideals  
Convenience ring ctors and homs  
Buchberger-Moeller (parent task)  
    Buchberger-Moeller: fast modular (...)  
    Buchberger-Moeller: impl via (...)  
Buchberger-Moeller: input conversions  
Makefile dependencies  
RingOf rather than owner? (and (...))  
Iterated CanonicalHom  
GCD normalization (e.g. monic)  
Convert old "task table" into redmine  
IsStdGraded: add for PPOrdering, (...)  
PPWithMask needs checking  
Example for change of coordinates (...)  
HilbertBasis from Normaliz: full-lattice (...)  
Generator for random ring elements  
Documentation for QBGenerator needs (...)  
No test for QBGenerator  
Approx QIR  
Transcribe C4 code for GCD in QQ[x]  
Multivariate lifting  
Move the various <matrix>::mySetEntry (...)  
Forward declarations  
Eliminate class RefPPMonoidElem?

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