

# CoCoALib

	2018-6				2018-7				2018-8				2018-9				2018-10				2018-11							
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47			
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																												

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  
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 (...)

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

**SLUG: Printing PPs with many indets**  
**Convenient RingHom pseudo-ctors**  
**Factorization in  $K(a,b)[x,y]$**   
**ElimMat is slow**  
**Sparse matrix (SparseMat)**  
**Coding guidelines**  
**Signal handler not portable?**  
**Intersection of Ideals: has GBasis?**  
**Implement monic0(f) for the case (...)**  
**Add LM to cocoalib ?**  
**MachineInt: chase through ULL (...)**  
**Documentation: a good model to (...)**  
**swap for new classes**  
**Random and threadsafe?**  
**Suggestion: Add "JumpTo" function (...)**  
**Use C++ attributes**  
**Finalize design for ideals in CoCoALib**  
**Code & doc structure: one-big-file (...)**  
**Add flag lhaveHomogGensValue (...)**  
**Add function IsHomog3(l)?**  
**Add new function for IsInRadical (...)**  
**Add a function CleanupGens making (...)**  
**Tidying ideal generators (for non-polynomial (...))**  
**Improve trivial operations with (...)**  
**Use long long (at least sometimes)?**  
**Release CoCoALib 0.99900**  
**Some tests have become slower**  
**Ensure tests do not need too much (...)**  
**CoCoALib - CoCoALib-1.0**  
**Sort out RingElem, RefRingElem, (...)**  
**List of all functions in CoCoALib**  
**printing polynomials**  
**keywords in documentation**  
**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

<p>Global setting: to use IsProbPrime (...)</p> <p>PrimeField -- new fn?</p> <p>Modules design: brainstorming</p> <p>Compilation on M\$Windows: Visual (...)</p> <p>FreeModule: unique copy?</p> <p>Add doc for ApproxPts2</p> <p>submodule constructor different (...)</p> <p>C++ nasty surprises</p> <p>Why is DMPI slower than DMPClean?</p> <p>Module homs</p> <p>Missing documentation and tests (...)</p> <p>CoCoAServer: what future, what (...)</p> <p>Resolution/morse: integrate Mario (...)</p> <p>add resolution data type</p> <p>implement algorithm(s) for resolutions</p> <p>PPMonoidElemAlias: redesign PPMonoidElem (...)</p> <p>add myHilbertSeries member field (...)</p> <p>add myJMill member field to ideal</p> <p>NewFreeModule of dimension 0</p> <p>Minimal syzygies (optimized implementation)</p> <p>Allow user to give a name to a (...)</p> <p>Error names and error messages (...)</p> <p>Semantics of IsPrintedWithMinus</p> <p>Improve UPoly eval at BigRat for (...)</p> <p>MemPool: order free blocks?</p> <p>Polynomial multiplication (product (...)</p> <p>Port RealRoots to C++</p> <p>Eigenvectors</p> <p>Which sets of generators in an (...)</p> <p>LinearSimplify: port to CoCoALib</p> <p>Unique copies of rings -- smart (...)</p> <p>Clang: automatic bug finding</p> <p>Documentation: write doc for RingDenseUPolyClean</p> <p>Quick/correct flag for bool3 fns</p>	
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**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  
SmallFplmpl: 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 (...)**  
**Improve RealRoots: compute sqfr (...)**

**Improve RootBound**

**All PPs of given wdeg**

**gcd: low degree but big coeffs (...)**

**RandomUnimodularMat is slow with (...)**

**French students' example with GFan**

**Create two separate radical fns (...)**

**DynamicBitset::lamAll1s**

**Unified Gaussian reduction impl**

**Benchmarks?**

**C++17: notes about updating**

**slimgb: Brickenstein, singular**

**Clean out OLD CODE?**

**CoCoALib - removed/duplicates**

**CoCoALib: ideas for student projects**