

# CoCoALib

|  | 2024-3 |    |    |    | 2024-4 |    |    |    | 2024-5 |    |    |    | 2024-6 |    |    |    | 2024-7 |    |    |    | 2024-8 |    |    |    |    |    |  |  |
|--|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|----|----|--|--|
|  | 10     | 11 | 12 | 13 | 14     | 15 | 16 | 17 | 18     | 19 | 20 | 21 | 22     | 23 | 24 | 25 | 26     | 27 | 28 | 29 | 30     | 31 | 32 | 33 | 34 | 35 |  |  |
| CoCoA                                    |        |    |    |    |        |    |    |    |        |    |    |    |        |    |    |    |        |    |    |    |        |    |    |    |    |    |  |  |
| CoCoALib                                 |        |    |    |    |        |    |    |    |        |    |    |    |        |    |    |    |        |    |    |    |        |    |    |    |    |    |  |  |
| 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  
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 (...)

**mysEqual, 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 (...)**

|   |  |
|---|--|
| <p> <b>mySquare and myPowerSmallExp</b><br/> <b>New fn: transform ideal with ring (...)</b><br/> <b>Printing for RingElem</b><br/> <b>Clean up revised RatReconstructByContFrac (...)</b><br/> <b>Upper bound for value of poly in (...)</b><br/> <b>Matrix rank is slow (over QQ)</b><br/> <b>Non-standard DegRevLex (NonStdDegRevLex, (...)</b><br/> <b>New function: Threadsafe RandomLinearForm (...)</b><br/> <b>exgcd; solve Bezout equation</b><br/> <b>Make a poly ring QQ[x,y,z] also (...)</b><br/> <b>Ideal equality</b><br/> <b>Ideal Ops: sort-cuts for trivial (...)</b><br/> <b>Port old "clever" code for matrix (...)</b><br/> <b>Improve RealRoots: compute sqfr (...)</b><br/> <b>Improve RootBound</b><br/> <b>All PPs of given wdeg</b><br/> <b>gcd: low degree but big coeffs (...)</b><br/> <b>RandomUnimodularMat is slow with (...)</b><br/> <b>French students' example with GFan</b><br/> <b>Create two separate radical fns (...)</b><br/> <b>DynamicBitset::lamAll1s</b><br/> <b>Unified Gaussian reduction impl</b><br/> <b>Benchmarks?</b><br/> <b>C++17: notes about updating</b><br/> <b>slimgb: Brickenstein, singular</b><br/> <b>Clean out OLD CODE?</b> </p> |  |
|---|--|