## CoCoALib

16 May 2024 1/15

configure script: give summary ()	Closed 100%
NumDigits: sometimes gives wrong ()	Closed 100%
IsMaximal, IsPrimary for IDEAL ()	Closed 100%
New function: FrobeniusMat	Closed 100%
BigRat: read from a string in "decimal" ()	Closed 100%
GBasis verbose mode	Closed 100%
ReadExpr: cannot handle exponent ()	Closed 100%
ReadExpr: misreads 2/3^4	Closed 100%
New function: IsSqFree	Closed 100%
new file for old functions: obsolescent.C	Closed 100%
RandomUnimodularMat - random unimodular	() Closed 100%
determinant: fails for 0x0 matrix ()	Closed 100%
New function: HasGBasis	Closed 100%
New function: ReducedGBasis	Closed 100%
CheckForInterrupt does not work ()	Closed 100%
Which ostream for verbose/obsolescent ()	Closed 100%
In scripts: use portable test for ()	Closed 100%
square function	Closed 100%
Bruns SEGV: SparsePolyIter/DMPI ()	Closed 100%
ReducedGBasis for RingWeyl (and ()	Closed 100%
CPP flags in installed library	Closed 100%
LogStream: stream for log output	Closed 100%
Several tests fail when threadsafe-hack ()	Closed 100%
ExternalLibs: function for getting ()	Closed 100%
CoCoALib - CoCoALib-0.9950	
MachineInteger> MachineInt	
Rename NumTheory and NumTheoryQQ	
rename RingQ, RingZ> RingQQ, ()	
Saturation	
DMPI vs DMPII is slower than expected	
Clean up DivMask and doc	
ordering matrices with rational ()	
CoCoALib - CoCoALib-0.9951	
SwapRows, Cols	

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Add links to examples in documentation matrix - MatrixView Index page for html documentation QuotientRing problem Shorter simpler names for some (...) gcd: multivariate over non-prime (...) Brand new symbol(s) Separate ThreadsafeCounter from (...) Cleanup doc for rings Integer operations CoCoALib - CoCoALib-0.9952 p-th root CFApprox: division by zero Normaliz: "double" cone for speed (...) NBM: add SparsePolyRing as argument (...) **Better RingElems** Leading form **AreMonomials** Rings: default ctor & assignment Review the utility of RefRingElem CoCoALib - CoCoALib-0.9953 polynomial coefficient extraction (...) implement creation of a PPMonoidElement (...) Rename PPMonoidEvZZ? Polynomial content Names for random streams MachineInt or long as fn arg type (...) CoCoA4io Porting "IdealOfPoints" change long args in matrices into (...) Revise interface to SmallFpImpl (...) Doc & example for convert IsHomog: should it throw an error (...) Add homog (homogenized) for ideal

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**Exponent range (in power products)** PPMonoids: check for exponent overflow (...) Rational approximation Add fault tolerant rational reconstruction (...) PPMonoid pseudo-ctors without symbol (...) Equality of (sub)modules DenseUPolyClean uses size t "configure" does not set BOOST (...) IdealOfPoints: gens are actually (...) New function BinRepr (was BinExp, (...) Store unique copy of QQ[t\_1..t\_n] (...) CoCoALib - CoCoALib-0.99531 Squarefree factorization - Alessio (...) Squarefree factorization - overhead Squarefree factorization - generic (...) Squarefree factorization - for (...) Squarefree factorization - (...) Squarefree factorization (...) Squarefree factorization (...) Squarefree factorization - (...) Squarefree factorization - (...) Buchberger-Moeller: generic impl add CoeffVecWRT to cocoalib Colon of zero ideal fails (zero-divisors) problem loading library.H (parallel (...) CoCoALib - CoCoALib-0.99532 CoCoA website: update web page (...) Squarefree factorization Squarefree factorization - (...) **Conversion functions -- documentation** OrdvArith documentation needs rewriting Function to get the Hilbert Polynomial (...) ReadExpr: input polynomials in (...) myDeriv for RingDenseUPolyClean (...)

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AsINT and AsRAT -- ConvertTo<BigInt> (...) Update/Improve geobucket documentation IsDivisible for RingElem with nice (...) NewZZmod and NewRingFp: improve (...) LongRange(a,b) returning vector (...) function (CoCoALib) for minimal (...) Check consistency of template class (...) RingElem ctor from mpz\_t (from (...) design of factorization template (...) OrdvArith: use of a single buffer (...) **New fn: NumPartitions** ex-Normaliz2-overflow.in too long (...) ConvertTo with optional arg to (...) Zero to the power zero, 0^0 ideal: minimalize or minimalized? CoCoA website: CoCoALib-0.99532 CoCoALib - CoCoALib-0.99533 Easter14 Coefficient extraction implement "binomial" (coefficient) (...) **BigInt - NumTheory** Rename MatrixViews ZeroMat & FilledMat Recognizing finite fields Automatic conversion from bool3 (...) How to return a Hilbert Series (...) Notes for adding/removing files (...) DynamicBitset example using LPP Valgrind: keep CoCoALib at 0 memory (...) Remove denominators:  $QQ[x] \rightarrow ZZ[x]$  (...) Problems with DenseMatImpl::myResize **IsZeroDivisor** add DeleteCol, DeleteRow IsDivisible -- exact semantics? deg(F,X) instead of MaxExponent(F,X) (...)

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Rename MatrixArith to MatrixOperations PPMonoidOv is not threadsafe factorization: public data fields, (...) Use -fopenmp flag when compiling (...) NewPolyRing\_DMPI has no constructor (...) make check in examples/ directory (...) IsIntegralDomain, lamIntegralDomain3 Renaming: SqfreeFactor to SqFreeFactor SyzOfGens (CoCoALib): fix shifts Rename file TmpFactor to factor MaxSquarableInteger gives wrong (...) Fn to test if an integer is a power (...) Release: CoCoALib-0.99533 Convert BigInt/BigRat to string IO: move GlobalInput etc to CoCoA (...) Compilation problem in TmpMorsePaths.C **Progress reporter** CoCoALib/io.H CoCoALib - CoCoALib-0.99534 Seoul14 polynomial coefficient extraction (...) cleanup doc for matrix, MatrixViews, (...) MatByRows, MatByCols Repeated rows/cols in submat Usefulness of ring casting fns (...) FractionField -- only of TrueGCDDomain? CoCoALib normaliz interface **Automatic mapping of RingElems** Documentation for tmp.H (utils (...) Compilation problem with "degree.H" (...) Module ordering and grading (and (...) ordering and grading (weights) (...) Remove AsPolyRing etc? Documentation for adding functions (...) Release: CoCoALib-0.99534

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CoCoALib-Normaliz interface: cannot (...)
Valid symbol heads
CmpAbs for RingElem

Hilbert crashes with > 100 indeterminates

**Example for PPVector: ex-PPVector** 

BaseRing for all rings

(Hilbert-) quasi-polynomials

CoCoALib - CoCoALib-0.99535 Sep14

Subtle ref count bug for poly rings (...)

problem with "matrix" argument (...)

Release: CoCoALib-0.99535

CoCoALib - CoCoALib-0.99536 June 2015

Compute inverse in quotient ring (...)

Release: CoCoALib-0.99536

Modulus (for CRTMill) ambiguous

Inverse of a matrix over ZZ

NumTheory: sieve of Eratosthenes Ambiguous: rank for matrix (in (...)

Clean test-FreeModule1

Move code in test file into namespace (...)

**QBGenerator crashes** 

RatReconstructByLattice fails in (...)

power for PPs is too slow

Fault tolerant rational reconstruction: (...)

DetDirect calls myAddMul with 0 (...)

Interrupt mechanism

CheckForInterrupt: string arg to (...)

Move code in examples into namespace (...)

CoCoALib - CoCoALib-0.99538 summer 2015

Release: CoCoALib-0.99538 (together (...)

RandomSubsetIndices, RandomTupleIndices?

New function for making list of (...)

CoCoALib - CoCoALib-0.99540 Feb 2016

Janet Bases: check and include (...)

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BigInt ctor from a machine integer OrdMat: should it be a reference (...) Make SmallFplmpl safer to use Convert a PPMonoidElem to RingElem (...) ExternalLib-GFan: first prototype **DMPZmerge:** make non-recursive FloatStr prints a NUL character abs for MachineInt Add new fn InvModNoCheck ZeroMat and IdentityMat should (...) AssignZero for matrix ILogBase: change name? Add new fn SimplestBinaryRatBetween Rename isqrt to FloorSqrt (following (...) GradingMat: does anyone need it? NewMatMinimize, NewMatCompleteOrd (...) IsTermOrdering Fn names: LexMat or MatLex; StdDegRevLexMat (...) Use MachineInt instead of long (...) primary.cocoa5 Fix test failures (after revising (...) SmallFplmpl: export fns for a fixed (...) CoCoALib - CoCoALib-0.99542 spring 2016 Implement MinPoly in CoCoALib CoCoALib - CoCoALib-0.99560 matrix constructors GlobalManager: registration of (...) Use BOOST lib default location (...) **BOOST** -- how it could help in CoCoALib implement IsPrime3, IsMaximal3 Release: CoCoALib-0.99560 (together (...) **Tidy CoCoA root directory** Temporary directories used during (...) Add graeffe function?

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Time limit: let user specify time (...) Module index component in internal (...) Makefile dependencies in src/tests/ Stats in GBMill (GReductor) frobby (v0.9.0) does not compile (...) Configuration: where to keep source (...) NumTheory: behaviour of InvMod (...) compilation on fedora 23: some (...) CoCoALib function for radical (or (...) PPOrderingCtor: name of mem fn (...) ReadExpr is too slow on large polys My first compilations with clang General verbose mode? configure: possibly ignore GMP (...) SmallestNonDivisor -- new fn configuration: include -std=c++03 (...) IsInRadical: case of homog ideal Split poly into homog parts Improvement: how to sort QuotientBasis? LF curiously slow (breaking a poly (...) ReadExpr(P, string) and RingElem(P, (...) New function: IdealOfGBasis, IdealOfMinGens (...) CoCoALib version in Documentation (...) Catching an (expected) error Bug in MinPolyModular (ugly prime) Design: should we allow an ideal (...) makefile: ungraceful when interrupted ideal() \* RingElem gives error factor in ZZ[x] gives errors

Closed 100%

Rename ERR::SERIOUS to ERR::ShouldNeverGetHere

MinPolyQuot: check input (was: (...)
New design for interrupt mechanism
MinPolyQuot: runs out of primes

ExternaLib-MathSAT: first prototype

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Bug in MinPolyModular (insufficient (...) Implement RootBound New fn: IsCoprime (whenever gcd (...) Compilaton with --debug configuration (...) Polynomial multiplication wrong (...) File names, coding conventions: (...) CoCoALib - CoCoALib-0.99600 Porting "IdealOfProjectivePoints" New file: BigRatOps port to CoCoALib: Homomorphism (...) ExternalLib: simplify configuration IsPositiveGrading -- really need (...) Doc for BigInt, BigIntOps, BigRat (...) New function: MinPoly of RingElem (...) New function: PrimaryDecomposition0 (...) Makefile: install target for CoCoALib coefficients for MinPoly e Frobenius MinPolyQuot: missing doc Determinant of matrix over QQ (whose (...) PrevPrime and NextPrime anomalies Move examples directory into doc (...) New function: SubmoduleOfMinGens Sturm sequence File names, coding conventions: (...) Closed 100% Release: CoCoALib-0.99600 (together (...) SmallFpImpl: new ctor arg to say (...) Create a new "prime source" iterator New function: MinPolyQuotHeuristic (...) Add global enum "verify/DontVerify" Check semantics of NoSmallFactorSeq Split SparsePolyRing.C in smaller (...) MinPoly over QQ: verification may (...) New class VerificationLevel New function: RandomLinearForm (...)

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File names: use "SparsePolyOps" (...) New function: myPrimaryDecomposition 0dim BigRat(0) unexpectedly compiles! (...) CpuTime is costly! "mod" for BigInt factor: multivariate, wrong RemainingFactor (...) Release: CoCoALib-0.99580 (together (...) GCD bug with high degree arg factor over algebraic extensions SyzOfGens: bug with zero generators CoCoALib - CoCoALib-0.99650 November (...) **Bareiss algorithm** Matrix determinant over ZZ Replace auto\_ptr in preparation (...) txt2tags: double quotes wrong in (...) GCD very slow Rename iroot? Primary Decompositon (zero-dim) (...) gcd crashes (Floating point exception) New function: HasPositiveGrading HilbertSeries should check grading NewPolyRing default indet names IsPrime(0) MinPolyQuot: guaranteed and ideal (...) principal ideal has a Gbasis SEGV: CoCoALib with Normaliz in (...) New function: radical for monomial (...) RingID: different values in test-output (...) C++14: use nullptr ThreadsafeCounter is now obsolete? Release 0.99650 Printing for (prime) finite fields Never use "using namespace .." (...)

New fn: FixedDivisor (formerly (...)

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CoprimeFactorBasis: mishandles (...) New function primorial Factorization mod p SmoothFactor: allow limit = 1? RealRoots: gives odd number of (...) txt2tags: LaTeX/PDF section numbers (...) New syntax for creating homomorphisms (...) New syntax for NewQuotientRing New function: vector of RingElem (...) Rename SparsePolyOps-MonomialIdeal (...) Problem with linking the library New function: ctor of PPVector (...) CoCoALib - CoCoALib-0.99700 Makefile problem in ROOT and/or (...) Squarefree GCD-free basis Return type & name for "indets" (...) Squarefree(?) GCD-free basis **Rows and Columns of a matrix** Constructor for vectors? CoCoAVector Indets actually in a poly (or vector (...) QuotientRing: is it correct to (...) configure: search for libgmp too (...) CoCoALib configuration: BOOST dependency ElimMat, ElimHomogMat: complain (...) New function or explain: first (...) Output to bad stream (operator<< (...) configure: auxiliary scripts should (...) Catching interrupts in example (...) IsInRadical: sometimes a bit slow Split NumTheory.C into several (...) should BeginIter(RingElem) be in (...) ReadExpr is too slow on long lists (...) Fix file permissions after using (...)

Remove unnecessary files before (...)

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Gaussian row reduction

test-GFan1 fails

Problem rebuilding dependencies (...)

Release CoCoALib-0.99700

configure script help

GBasis verbose mode: some output (...)

Should configure remove the file (...)

CpuTimeLimit: limit "intervals" (...)

Fails to recognize zero-dim ideal

Make IsZeroDim more robust

myZeroPtr and myOnePtr

gfan: installation problem: configure (...)

IsPrimary sometimes wrong

configure script: MODE option obsolete?

IdealOfProjectivePoints and MinGens

Main Makefile: does not rebuild (...)

**New function: LawrenceMat** 

**GBasisByHomog for DegLex** 

CoCoALib - CoCoALib-0.99710

New fn ConstantTerm?

myTestIsPrimary & Co. : fix design

Bivariate factor bug: sometimes (...)

Release CoCoALib-0.99710

CoCoALib - CoCoALib-0.99800

Adjoint of a non-invertible matrix

object files collected in one directory

Porting "LinKer"

Replace bool3 by tribool

Keep CoCoALib web page up to date! (...)

C++14: MachineInt

Instructions for compiling libnormaliz

valuation slow for large inputs

MemPool: review min and max loaf (...)

ar gives warnings on fedora 23

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Function MakeTermOrd should be (...)

Janet basis code: TmpJB files give (...)

SimplestBigRatBetween: why is it (...)

SmoothFactor: slow when a factor (...)

Split MatrixOps

Reconsider design for accessing (...)

FreeModule: get canonical basis

Tidy up code for matrix determinant

adj: for matrices 7x7 and bigger

Radical 0-dim: varied timings

GBasisTimeout: not working as expected

RingElems: syntax with [ and ] (...)

SHA checksum for released code

New fn: interreduction

Radical 0-dim NYI? missing case (...)

Flatten for a matrix

Make SmoothFactor interruptible

Redesign interrupt mechanism?

Name of TensorMat; change to KroneckerProd?

Change CoCoA ERROR into CoCoA THROW ERROR

SmoothFactor: use FactorMultiplicity

Change syntax apply(phi,M) into (...)

isystem not working as expected

Release CoCoALib 0.99800

IsPowerOf2 for rationals

ker bug (quotientinghom for R/ideal())

New function: MinusOneToPower

Normaliz 3.8.9

factorization: allow zero as exponent?

IsDivisible in a field?

Indets in coeffring are ringelems (...)

RandomLinearForm

Input fns: action when when istream (...)

MacOS compilation with clang

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**INPUT** questions

RingElem from string (ReadExpr)

Require decimal mode for ostream?

Software licence

CpuTimeLimit: more frequent clock (...)

BigRat: ctor from machine int IsInRadical: gives "weird" error

FloatStr sometimes produces NUL (...)

New fn prim for polys

CRASH/ABORT: GMP overflow IdealOfPoints: allow matrix of (...)

CRASH: LinKerZZ

**Compilation of Normaliz** 

Normaliz 3.8.10

RingHom: implement phi(X) as apply(phi, (...)

Compilation ambiguity binomial: domain of defn?

CoCoALib - CoCoALib-0.99850

submat takes only vector<long>

C++11 compatibility questions

Mod fn for computing remainder

MatrixView/function for viewing (...)

W.Bruns's wish list

Improve doc about ordering/grading (...)

Iter for subsets/tuples

Make RingBase::myCharacteristic (...)

Which ubuntu / debian packages (...)

Automatic mapping of RingElem: (...)

Makefile; limit dependencies on (...)

PPMonoidSparse: impl of sparse (...)

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