

PSA computing performance

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narval_emulator

- static analysis
Total Physical Source Lines of Code = 115 077
- dynamic analysis
- what comes next ?

*"I took a speed-reading course and read War and Peace in twenty minutes.
It involves Russia."
— Woody Allen*



Volumetry narval_emulator

Table – sloccount — count Source Lines Of Code (SLOC)

SLOC	Directory	C++	C	Autres
55 741	zPrograms	29 275	26 466	
33 390	filters	17 768	15 622	
6 919	PRISMA	6 913		csH=3,sh=3
5 266	common	5 266		
5 142	producers	5 046	96	
3 904	consumers	3 904		
1 994	WinCTest	1 994		
1 330	builders	1 330		
816	AGATREE	816		
575	zUseful			python=575
115 077	Σ	72 312	42 184	

cpp 72 312 (62.84%)

ansic 42 184 (36.66%)

python 575 (0.50%)

csH 3 (0.00%)

sh 3 (0.00%)

174 classes

491 files

6 589 functions



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Table – cloc — count Comment Lines Of Code (CLOC)

Language	Files	Blank	Comment	Code
C/C++ Header	344	11 791	21 290	55 310
C++	104	7 618	6 309	40 653
C	43	4 391	3 563	18 696
Σ	491	23 800	31 162	114 659

Are so many comments really helpful ?

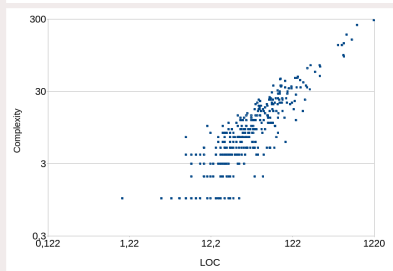
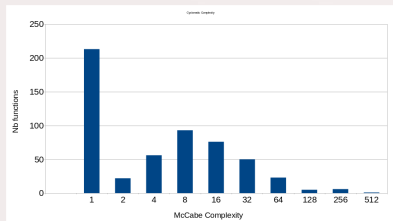


Cyclomatic complexity

⇒ « *A measure of the decision complexity of the functions* »

⇒ « *number of possible paths in a function flow* »

⇒ each if, for, while or switch increases cyclomatic number.





Floating point

float 2 731 lines

double 3 229 lines

⇒ Why two precisions ?

Elementary functions

<u>function</u>	<u>nb calls</u>
sqrt	228
pow	66
sin	54
cos	53
exp	38
log	32
acos	31
tan	10
atan	8
asin	3
sinh	2
cosh	2
log10	2
sincos	2
Σ	536

- often for constants ⇒ constexpr
- strange mix of precision with the square root
- sincos should be used more often
- not yet static analysis of linear algebra
- limited static footprint (0.5%), but presumably large runtime



Dynamic Analysis

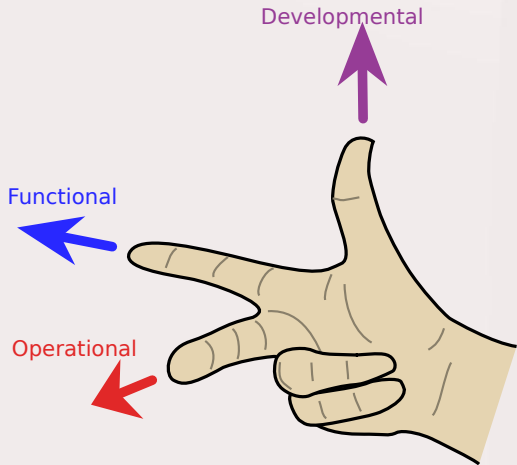
runtime

- Profiling and coverage
 - gprof
 - callgrind / cachegrind / massif (valgrind)
 - perf
- Stochastic Arithmetic
 - verrou (valgrind)
 - Cadna
 - Verificarlo

⇒ we need good, relevant test cases



toward Clean Code





narval_emulator

- L3/M1 internship this summer
- MITI¹ (IJCLab - Paris 6) doctoral grant