Tom Cornebize

PhD student in computer science

Contact

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Web

cornebize.net
github.com/Ezibenroc

Skills

Python	★★★★★
R	★★★★☆
LaTeX	★★★★☆
GNU/Linux	★★★★☆
C	★★★★☆
C++	★★★★☆
Java	★★★★☆
MPI	★★★☆☆
SQL	★★☆☆☆

Languages

French	★★★★★
English	★★★★☆
German	★☆☆☆☆

Education

2017 – 2021 Grenoble (FR)
PhD in Computer Science — Grenoble Alps University
Under the supervision of Arnaud Legrand.
Topics of interest: high performance computing, distributed systems, performance evaluation, statistical modeling.

2015 – 2017 Grenoble (FR)
Master's & Engineering Degrees in Computer Science — Ensimag
Graduate specialization in parallel and distributed systems.
Obtained a Master of Science, with highest honor, ranked $2^{nd}/88$.

2013 – 2015 Lyon (FR)
Bachelor's Degree in Theoretical Computer Science — ENS Lyon
Undergraduate and postgraduate intensive program in theoretical computer science.
Obtained a Bachelor of Science, with great honor.

Internships

Oct/17 – Dec/17 Chicago (US)
Performance variability in supercomputers — Argonne Laboratory
Under the supervision of Swann Perarnau.
- Performed several experiments and statistical analyses to characterize performance variability.

Feb/17 – Jul/17 Grenoble (FR)
Efficient simulation of large scale MPI applications — Inria
Under the supervision of Arnaud Legrand.
- Profiled and generated traces of the simulator's execution.
- Modeled the expensive functions to inject their expected duration in the simulation.
- Replaced large allocations by fake allocations.
- Used huge pages to decrease the page table size.
- Outcome: simulate executions several orders of magnitude larger while keeping a small error.

May/16 – Aug/16 Walldorf (DE)
Multicast communication in SAP HANA — SAP
Under the supervision of Norman May.

May/15 – Aug/15 Grenoble (FR)
Job isolation in fat tree topologies — Bull
Under the supervision of Matthieu Perotin.

Teaching

Jan/20 – Mar/20 Grenoble (FR)
Statistical modeling and literate programming — Grenoble Alps University
20 hours – 3rd year students (L3) in business informatics.
Data analysis and visualization in R.

Sep/19 – Dec/19 Grenoble (FR)
Algorithmics and imperative programming — Polytech Grenoble
30 hours – 3rd year students (L3) in software engineer school.
Computational complexity, correctness proof, data structures.

Sep/18 – Dec/18 Grenoble (FR)
Principles of Operating systems — Grenoble Alps University
30 hours – 4th year sudents (M1) in computer science.
Memory allocation, multithreading, synchronization, buffered I/O, performance evaluation.

Sep/18 – Dec/18 Grenoble (FR)
Software development basis — Grenoble Alps University
30 hours – 2nd year sudents (L2) in computer science.
Functionnal & robustness testing, modularisation, type abstraction.

Jan/18 – May/18 Grenoble (FR)
Introduction to Python — Grenoble Alps University
64 hours – 1st year sudents (L1) in earth science.
Variables and types, control flow statements, data structures, files.

Software projects

May/16 – now **Contribution to Roaring bitmap** roaringbitmap.org

Fast and lightweight set for unsigned 32 bits integers.

- Contributed to CRoaring, the C library.
  - Implemented range constructor, selection and subset queries.
  - Fixed several bugs.
  - Repository: github.com/roaringBitmap/CRoaring
- Developed PyRoaring, a Python wrapper for the C library.
  - Similar API than the builtin Python set, but several orders of magnitude faster.
  - Used the Cython programming language.
  - Extensive tests caught several bugs of the C library.
  - Repository: github.com/Ezibenroc/PyRoaringBitMap

Sep/14 – Dec/14 **Platypus** askplatyp.us

Modular and open source question answering framework.

- Developed a question parsing module in Python, with a grammatical approach (Stanford CoreNLP and NLTK libraries).
- Framework currently used and valorized by Lexistems SAS.

Publications

Conference articles

[1] Efficient and Generalized Decentralized Monitoring of Regular Languages
Falcone, Y.; Cornebize, T., and Fernandez, J.-C.
URL: https://hal.archives-ouvertes.fr/hal-00972559
34th Formal Techniques for Networked and Distributed Systems (FORTE), 2014

[2] Isolating Jobs for Security on High-Performance Fabrics
Perotin, M. and Cornebize, T.
2017 IEEE 3rd International Workshop on High-Performance Interconnection Networks in the Exascale and Big-Data Era (HiPINEB), 2017

[3] Predicting the Energy Consumption of MPI Applications at Scale Using a Single Node
Heinrich, F. C.; Cornebize, T.; Degomme, A.; Legrand, A.; Carpen-Amarie, A.; Hunold, S.; Orgerie, A.-C., and Quinson, M.
URL: https://hal.inria.fr/hal-01523608
2017 IEEE International Conference on Cluster Computing (CLUSTER), 2017

[4] Fast and Faithful Performance Prediction of MPI Applications: the HPL Case Study
Cornebize, T.; Legrand, A., and Heinrich, F. C.
URL: https://hal.inria.fr/hal-02096571
2019 IEEE International Conference on Cluster Computing (CLUSTER), 2019

Unpublished articles

[7] DGEMM performance is data-dependent
Cornebize, T. and Legrand, A.
URL: https://hal.inria.fr/hal-02401760

[8] Simulation-based Optimization and Sensibility Analysis of MPI Applications: Variability Matters
Cornebize, T. and Legrand, A.
URL: https://hal.inria.fr/hal-03141988

Thesis

[5] Capacity Planning of Supercomputers: Simulating MPI Applications at Scale
Cornebize, T.
URL: https://hal.inria.fr/hal-01544827
June 2017

. [6] High Performance Computing: Towards Better Performance Predictions and Experiments
Cornebize, T.
June 2021