Hugues Bruant

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I have 20 years of experience with software engineering, a deep drive towards robustness and efficiency, and a knack for noticing high-leverage opportunities that most people miss or shy away from.

After a break to focus on my adorable kids, I am excited to put those skills to good use again.

Work Experience

Independent Software Consultant — **Affirm** — San Francisco, CA October 2024 – January 2025
Deprecation and cleanup of a legacy system after it caused an outage threatening SLAs with major partners.

Staff Software Engineer — **Affirm** — San Francisco, CA December 2018 – May 2023
- **Led Python 2 to 3 migration for ML Platform**, ensuring a smooth cutover of the critical underwriting and fraud models, and related training and inference infrastructure.
- **Increased ML model release velocity tenfold**, ~1/y to ~10/y, via improved tooling and processes.
- Increased robustness, usability, and performance of the critical Risk Validation test flow, used to assess the impact of code and model changes on the outcome of underwriting and fraud decisioning before merge/deploy.
- Decreased **CI time-to-green build from >90min to <10min**, despite order of magnitude increase in scale.
- Decreased **python dev env setup from >5min to a few seconds**, and enabled sub-second updates.
- Drove **improved coverage and accuracy of Python type annotations** across the entire codebase.
- **Sped up Python typechecking by orders of magnitude** via better internal tooling, and **upstream fixes**.

Principal Software Engineer — **AeroFS** — Palo Alto, CA June 2016 – August 2018
- Achieved **near-instant auto-update** for the AeroFS desktop client (from minutes to mere seconds), via incremental upgrades, and shaving hundreds of MB off the appliance disk footprint.
- Designed and implemented the new AeroFS Storage Agent, alternative to the old Team Server, to address the requirement for a well-understood and scalable org-wide file server within a B2B private cloud context.
- Led the **private cloud to SaaS transition** of the Amium product.
- Led exploratory work to incorporate machine-learning models to improve UX in the Redbooth product.

Senior Software Architect — **AeroFS** — Toronto, ON, Canada November 2014 – May 2016
- **Led an overhaul of the core distributed file synchronization algorithm**.
- **Reduced disk and RAM footprint by hundreds of megabytes** for the private cloud VM, and allowing it to **scale to order of magnitude more users on equivalent hardware**.
- **Led Java 6 to Java 8 upgrade** across both desktop app and backend, with a **custom build of the JRE**, incorporating some critical patches.

Software Engineer — **AeroFS** — Palo Alto, CA July 2012 – October 2014
- Delivered major scalability and UX improvements to the AeroFS desktop client, allowing it to gracefully scale to significantly larger datasets (tens of thousands of directories, and millions of files).
- Designed and implemented the RESTful Content API and related proxy/tunnel protocol to **expose users' files via a web interface while preserving E2E encryption** guarantees.

Software Engineer Intern — **ARM** — Cambridge, UK June 2011 – October 2011
- Improved performance of the ARM simulator (accurate emulator of various ARM hardware architectures on x86 machines) through judicious use of multithreading and wait-free queues.
- Exploratory project integrating JIT-compilation into the ARM simulator to improve performance.

Software Engineer Intern — **Google** — Zurich, Switzerland June 2010 – August 2010
- Rewrote the core sitemaps scheduler, a significant piece of the indexing pipeline, to achieve better parallelism and improved scalability.
- Received a peer bonus for "awesome work on sitemaps".

Notable Open Source Projects and Contributions

prunepytest – *personal* – Python, Rust, pytest 2024
Extremely fast static computation of the Python import graph for large codebases, by leveraging the Python parser from Ruff, and PyO3 to integrate into a Python module. Quick derivation of a **minimal safe** subset of affected tests to run in order to exercise any given code diff, enabling **order of magnitude savings in time-to-green build and overall CI cost** when deployed at scale.
As a benchmark, for one medium-sized company it was tested on, with a codebase on the order of multiple MLoC of Python, parsing the entire codebase from scratch and computing the test set took a few seconds on a 2020-vintage macbook pro, and a conservative estimate of savings amounted to ~1M USD/year, for EC2 instances alone.

mypy – Python 2020 – 2022
Multiple significant performance improvements upstreamed into mypy.

golang – Go 2017
Multiple performance improvements upstreamed into Go runtime and compiler.

SSMP – *AeroFS* – RFC, Go, Java 2015
Design, specification, and reference implementation of a simple messaging protocol.

gockerize – *AeroFS* – Go, docker, bash 2015
CLI tool to easily package Go app into a single-binary docker image.

casim – *CMU* – C++, CUDA, VHDL 2012
Parallel simulation of Conway's Game Of Life, on GPU and FPGA.

almostrisc – *Ensimag* – VHDL, assembly 2010
16bit pipelined CPU design, in VHDL, with VGA and PS/2 peripherals, targeting Spartan 3 FPGA.

XOS – *personal* – z80 assembly 2009 – 2010
Operating System for TI-83+/84+ graphing calculators.

Edyuk – *personal* – C++, Qt4 2006 – 2009
IDE targeted at C++/Qt4 projects, with extremely fast and accurate code completion.

Education

Carnegie Mellon University — Pittsburgh, PA, USA Spring 2012
Exchange semester in the Computer Science department.

Ensimag, Grenoble Institute of Technology — Grenoble, France 2009 – 2013
MS in Computer Science and Applied Mathematics.

Languages

Computer: Python, Go, Java, C/C++, Rust, Assembly (z80, MIPS, x86, ARM), VHDL, Bash

Human: English *(fluent, TOEFL iBT 111/120)*, French *(native)*