Marc Coiffier

Developer / Systems administrator

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🎂 June 28th, 1991

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🌐 Online résumé (https://coiffier.net/CV/?lang=en)

Skills

- **Empathy**
- **Curiosity**
- **Adaptability**
- **Teamwork**
- **Initiative**
- **Tenacity**
- **Politeness**

Competences

- **Programming** (Haskell, Python, Shell, C/C++, ...)
- **Systems administration Linux** (Debian, ArchLinux, NixOS)
- **Automation / Deployment** (Docker, Nix, CI/CD, ...)
- **Fluent english**
- **Collaborative development** (Git, GitHub, SourceHut, ...)
- **Formal methods and specification** (Coq, Idris)
- **Web technologies** (JavaScript, HTML/CSS, APIs, ...)

Experience

2024-2025

Systems administrator at the IPAG

Managing the computer infrastructure at the Insitute of Planetology and Astrophysics in Grenoble, totalling more than 150 users requiring a variety of tools and environments

Developed an "app store" that runs on Linux, to present our users with a curated list of research-specific applications, that they can install in one click.

Designed, developed and deployed a Web application to help in monitoring the institute's computers, and in maintaining compliance with our IT Security Policy

Participating in the community project Idefix (https://github.com/idefix-code/idefix), and collaborating with Geoffroy Lesur to work on the continuous integration of the project into various HPC environments (Jean-Zay at IDRIS, Adastra at CINES, and Bigfoot at GRICAD)

2016-2020

Thesis on program proofs at VERIMAG lab

Designing an extension to the Calculus of Constructions that can generate induction principles on Church encodings.

Using Coq to prove coherence and strong normalization properties for this extension.

Using Coq to prove certain algorithms of the OCaml standard library (for example, that its implementation of MergeSort is correct and stable).

Developing a "proof wiki", a static site generated through literate programming, that allows exploration and verification of proofs in the browser.

2012-2016

Systems administrator at the UFR IM²AG

Managing the lab computers and servers at the UFR IM²AG.

- Providing level 1 IT support to the UFR staff, escalating to central IT when necessary
- Deploying Linux/Windows dual-boot images using CloneZilla over PXE
- Orchestrating Linux updates / software installs via a local Debian package server
- Maintaining infrastructure and service documentation in a semi-open wiki site
- Monitoring lab computers using TARSIS, and internally-developped program for infrastructure management

Projects

GTK-Stream : a tool to manage GTK windows and widgets

Link to the project (https://coiffier.net/projects/gtk-stream/)
A Python tool to create and pilot a graphical application by establishing a bidirectional serial connection that allows sending XML-encoded messages, and receiving graphical events.

- Portable : tested on Linux, MaxOS, and the WSL
- Lightweight : only depends on the GTK library and the Python standard library
- Easy : uses simple technologies (stdin/stdout and XML), can be learned in a few hours
- Integrates effortlessly into any kind of software project

Fix : a software distribution protocol and toolset

Link to the project (https://coiffier.net/projects/fix/)
Tools to facilitate developing, building, distributing, installing and updating software in a decentralized, secure, auditable and cross-platform manner.

- Secure : follows a client-server protocol (called RSDP) to allow building and installing untrusted software without giving it administrator privileges
- Cross-platform : allows the creation of cross-platform build plans, alleviating the need for maintaining a multitude of architecture- and distribution-specific packages
- Reproducible : stores dependencies using cryptographic identifiers to ensure integrity and reproducibility of build artifacts
- Decentralized : through the use of "signed metadata", allows each software project to independently attach dynamic and unforgeable information (such as whether a version is deprecated or newer version is available) about each of their packages

Curly : a compiler for a simple functional language

Link to the project (https://coiffier.net/projects/curly/)
A simple compiler, written in Haskell, that enforces reproducible cross-platform builds.

- A type-system that can infer recursive types (as with the term `λx.xx`)
- First-class typeclasses
- Single-pass linking, for just-in-time and static executable assembly code generation
- *Content-addressed* modules to provide reproducible builds by default
- Built-in documentation format, and second-order documentation (no more doc comments)
- Automatic *code-signing* when distributing modules

Omega : a micro-kernel

Link to the project (https://coiffier.net/projects/omega/)
A toy projet that taught me a lot about the way operating systems work internally.

- Multi-process with memory protection
- Multi-thread with inter-process synchronisation
- Complete with basic CLI and a scripting language
- Rudimentary keyboard, and VGA, drivers
- Blazing fast to boot !

Viz : an interaction network visualizer

Link to the project (https://coiffier.net/projects/viz/)
In order to design a beta-optimal evaluator for the Calculus of Construction, that uses interaction nets.

- Create and delete nodes and edges in an SVG canvas
- Apply reduction rules to see how the graph evolves
- Automatically smooth reposition nodes to minimize "internal tension" and make visualization more legible (uses gradient descent)

Education

2016

Network Engineer

Knowledge acquired by experience after 4 years' working as a systems administrator at the UFR IM^{2}AG.

2011

Maths and Computer Science Licentiate

At the Université Joseph Fourier in Grenoble

2008

Bachelor's Degree

At the Champollion High School in Grenoble

Interests

Music : piano, violin and guitar

Dance : Lindy Hop with Grenoble Swing (https://www.grenobleswing.com/) and traditional dances with the Folk Escapade (https://escapadefolk.netlib.re/)

Board games with the Grenoble Games' Den (https://maisondesjeux-grenoble.org/wordpress/)