



Jack Halford

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EDUCATION

42 programming school - Paris

08/2016–Present



- "Learn UNIX by rewriting all of it from scratch"
- C, POSIX, Rust, x86
- linux development, drivers, modules
- tcp/ip, client/server basics
- while at 42 I rewrote the following : `libc`, `bash`, `malloc`, `printf`, `nmap`, `ping`, `traceroute`, `ftp`, `otool`, `strace`

ENS Cachan - B.Sc. physics

09/2015–06/2016



- Modeling with `fortran`, `python`, `gnuplot`
- Modern Physics : quantum systems, special relativity, statistical systems
- Experimental Physics : optics, analog electronics, lasers
- Mathematics : complex analysis, hilbertian algebra
- Participated in the "CRANS" student club that acted as the campus ISP for ENS Cachan. Providing internet to 1300 users, managed over 200 wifi points, switches in a dozen buildings and ethernet ports in every student dorm.

2 year preparatory course (PTSI - PT)

09/2013–06/2015



- Mechanical engineering basics
- Automatic control theory, signal processing
- Classical physics
- Mathematics (real analysis, linear algebra, discrete probability)

WORK EXPERIENCE (3 PREVIOUS INTERSHIPS)

Gandi.net, Paris – Systems developer

09/2018–present



- Internship in the "hosting squad", managing iaas (`xen`) and paas (`lxc`, `cgroup`) products alongside large scale storage infrastructure (`zfs`, `nfs`, `iscsi`) over 4 data centers.
- Design and implementation FreeBSD syscalls : per-thread credential management and new VFS syscalls for a userspace fileserver (`nfs-ganesha`). (see <https://reviews.freebsd.org/rS341689>)
- Setup and maintenance of a FreeBSD CI platform for the `nfs-ganesha` project (the existing CIs maintained by CEA and Redhat were linux based).

Tempow (startup) – Paris

04/2017–09/2017



- Development of a custom bluetooth stack for connecting and synchronizing multiple speakers together. Integration of the modified stack in android at the OS level
- Ported the android bluetooth stack to `arm64-linux` for benchmarking on raspberry pi
- Successfully helped pitching the product at CES Asia (Shanghai - mai 2017) and MWCA (San Francisco - sep 2017)

IMPMC - Université Paris 6 Jussieu

05/2015–06/2015



- 5 week internship in a solid state physics lab
- Tight-binding modeling of rhombohedral graphene to study electronic properties (superconductivity) under exotic conditions (high temperature/pressure)
- Introduction to `fortran`'s `lapack/blas` libraries to produce high performance code
- Confirmed a PhD student's model by finding the same properties with another method.

PROJECTS

- Posix shell** Leading a team of 5 students to develop a fully fledged shell in C, including shell scripting, job control. Next to development, I am responsible for management of the team.
- Coilgun** As an undergraduate project, I built a coilgun alongside a complete simulation with `Matlab Simulink` to find optimal parameters for energy efficiency. Final version shot 50g steel bullets at 120km/h
- x86 kernel** Wrote a kernel from scratch in Rust targeting the `i386` architecture. I'm responsible for implementing paging, interruptions, x86 devices, PCI and hardware multitasking. I'm still learning and development is ongoing (paused) as a project for 42.
- Media Homeserver** Upkeeping of a media homeserver for family and friends, a 6Tb film library for ~15 users. I've often used this as an excuse to try out technologies I'm interested in such as `docker`, `zfs`, `prometheus`, `grafana` etc...

SKILLS

- Programming** solid knowledge of C, shell scripting and python, working knowledge of rust and golang
- Tools** have been exposed to tracing (`dtrace`, `ebpf`, `flamegraphs`), debugging (`gdb`), monitoring (`grafana`, `prometheus`) and all of the usual developer tools : `vim`, `git`, `make`, `jenkins`, `docker` etc...
- Systems** experience with both Linux and FreeBSD, exclusively x86 although I'm open to new architectures and systems.
- Networking** good knowledge of `tcp/udp/ip` development and the client server model (wrote an RFC compliant ftp client and server).
- Code quality** healthy habits regarding coding conventions, documentation and testing, experience with software development at scale
- Languages** fluent in english and french