

# Software Engineer

## Skills

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Languages I have used: C (10 years), C++ (9 years), Python (4 years)

Stuff I have implemented:

- UDP/TCP/IP, MAC Wi-Fi
- UNIX Profiler, Debugger, ELF Loader, Process scheduler
- Distributed map/reduce framework

Other things I have done successfully:

- Debug complex hardware/software interactions
- Manage a team across multiple timezones with strong cultural diversity
- Help the members of my team align their interests with those of the project
- Build a solid case for my projects to obtain internal funding
- Identify and execute the right strategy to maximize user adoption

## Experience summary

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2011 – today	Alcmeon (FR), CTO, co-founder
2005 – 2011	INRIA (FR), Software Lead ns-3
2008 (10 months)	University of Washington (USA), Visiting Scholar
2003 – 2005	INRIA (FR), Software Engineer
2001 – 2003	Sigma-Designs (FR/USA), Software Engineer
2000 (6 months)	Eazel (USA), Intern

## Alcmeon, 2011 – today, CTO, co-founder

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I did a lot of technical stuff myself:

- Crawled, parsed, and structured online Forums, Q&A websites.
- Designed algorithms to identify high-quality textual answers in user-generated content.
- Implemented map-reduce framework targeted at small-scale cloud-based clusters.
- Integrated Machine Learning solutions to automatically adapt to changing user behavior.
- Implemented web frontend and backend based on js, python, uwsgi, mysql & apache.

But also

- Made sure we provide kick-ass technical support.
- Recruited, led, and managed technical team (3) in charge of research, development and operations.
- Coordinated development and UX consultants with internal technical team.
- Led INRIA/CRG/Alcmeon consortium to win ANR-funded research project Ocktopus: <https://alcmeon.com/ocktopus/>

## **INRIA, 2005 – 2011, Software Lead ns-3**

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Helped ns-3 become the reference network simulator (<http://www.nsnam.org>) for network research both within academia and within the industry (Alcatel, Boeing, AT&T, US Navy Research Labs, Orange, Huawei, etc.):

- Designed object model.
- Implemented cpu and memory-efficient packet data structure based on Copy-On-Write techniques.
- Implemented Simulation models for UDP/IP/ICMP, MAC/PHY Wi-Fi.
- Implemented ELF Loader for i386 & x86-64 systems, thread-safe, binary-compatible with the glibc ELF loader to provide an unlimited number of namespaces through the `dlopen` API.
- Made gdb and valgrind able to track symbols in multiple namespaces.
- Implemented a POSIX-compatible kernel/library, including `fork`, `exec`.
- Integrated Linux kernel network stack in userspace simulation models.
- Prototyped multithreaded parallelization for multicore systems based on Read-Copy-Update reference counting.

But also:

- Championed ns-3 internally to fund the project.
- Recruited, managed, and lead local development team (5).
- Managed relationships with international collaborators (US, EU, JP).
- Created and managed the user and developer community.
- Obtained funding from google summer of code program multiple times.
- Evangelized use of ns-3 within other research institutes through presentations and seminars.

## **University of Washington, 2008 (10 months), Visiting Scholar**

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Overseas assignment for the INRIA to establish a technical and scientific collaboration between the INRIA and University of Washington in the field of network simulation using ns-3:

- Managed Release Process.
- Helped with API design.
- Evangelized new users through seminars on the use of ns-3 at University of Berkeley, UCSC and through demonstrations at scientific conferences.

## **INRIA, 2003 – 2005, Software Engineer**

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Implemented:

- Yans, a C++ prototype for ns-3,
- NEPI, a python tool used to describe, deploy, and control networking experiments,
- Bozo profiler: a C tool to extract call graphs dynamically for architectural analysis,
- MAC/PHY Wi-Fi C++ simulation models for ns-2,
- Automatic tunneling of RMI over ssh for the ProActive Java middleware,
- Linux Wi-Fi drivers.

Managed and provided software mentoring for other projects:

- Bio-reactor chemical reaction control,
- Medical image analysis,
- COQ formal proof tool.

## **Sigma-Designs, 2001 – 2003, Software Engineer**

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Implement the control software and debug the microcode of the video decompression chips that were developed by sigma-designs and sold to OEMs to build DVD players, Set-top boxes and Digital TV receivers:

- Developed cross-platform (Win32, Linux, eCos) C/C++ multi-threaded streaming framework.
- Implemented the DVD-Video specification for consumer DVD players (Kiss Technology DP 450 players, Momitsu 880 players, etc.).
- Debugged kernel drivers, microcode, development boards.

## **Eazel, 2000, Intern**

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Contributed to the development of the first version of Nautilus, the graphical desktop and file manager of GNOME before Eazel disappeared in early 2001, when the dot com bubble burst:

- Implemented Drag & Drop for the Tree View
- Prototyped Asynchronous activation of components through CORBA
- Fixed bugs

## Education

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2006 – 2010	Ph.D. at University of Nice, <i>Experimentation Tools for Networking Research</i> , under supervision from Walid Dabbous
1998 – 2001	Engineer at Telecom ParisTech (ENST), Software Engineering, Networking, Micro-Electronics

## Technical Program Committee

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2014, 2015	#Microposts
2010, 2011, 2015	WNS3
2008, 2009	Simutools

## Publications

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2014	<i>DCE: Test the real code of your protocols and applications over simulated networks</i> , IEEE Communications Magazine
2013	<i>Direct code execution: revisiting library OS architecture for reproducible network experiments</i> , Proceedings of the ninth ACM conference on Emerging networking experiments and technologies.
2011	<i>NEPI: An integration framework for Network Experimentation</i> , SoftCOM, 2011
2009	<i>NEPI: Using Independent Simulators, Emulators, and Testbeds for Easy Experimentation</i> , SIGOPS Operating Systems Review.
2008	<i>Efficient Collision Detection for Auto Rate Fallback Algorithm</i> , Proceedings of Third Workshop on multiMedia Applications over Wireless Networks.
2006	<i>Yet Another Network Simulator</i> , Proceedings of the 2006 workshop on ns-2
2004	<i>IEEE 802.11 Rate Adaptation : A Practical Approach</i> , Proceedings of the 7th ACM international symposium on Modeling, analysis and simulation of wireless and mobile systems.

## Languages

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French	native language
English	fluent (read, write, speak)