

# Duarte Nunes

*Software Engineer*

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## Summary

Software engineer with a strong background in concurrent programming and kernel programming. Currently immersed in distributed systems and high-performance, low-latency software.

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## Experience

Aug 2013 **Software Engineer**, *Midokura*.

- now* Works as a software engineer on MidoNet, a virtual network platform for IaaS clouds. Focuses on the architecture and implementation of the core network controller, a distributed and highly concurrent software written in Java and Scala. Responsibilities include:
- defining and implementing network controller features (e.g., resource protection, cross-site peering, L4 load balancing, etc.),
  - defining and implementing cross-controller features (e.g., distributed flow state management and replication, port migration, NAT port reservation, etc.)
  - performance and scalability improvements (e.g., measuring and accelerating the packet processing pipeline, reducing memory footprint, scaling the on-ramp and off-ramp gateways, re-write of the userspace netlink library, etc.)

Jun 2012 **Software Engineer**, *Nokia Siemens Networks*.

Jul 2013 Worked as a software engineer and architect on large-scale brownfield Java projects concerning the planning and management of large multi-layer optical networks. Responsibilities included: enforcement of architectural constraints, code review, hands-on knowledge sharing workshops (mainly about concurrent programming and software development), design and implementation of infrastructure modules. Lead the engineering of a concurrent and efficient component to mediate between the planning and evolution of a network and the real-time events generated by its physical, deployed representation.

Jan 2009 **Software Engineer**, *CCISEL*.

Aug 2013 Member of the CCISEL group at ISEL, doing research, development, education and training. Examples of activities:

### 2009 - 2013

Did research on concurrent programming and operating systems (mainly Windows Research Kernel); participated in the development the [SlimThreading](#) framework, containing synchronization algorithms;

## 2011-2012

Lectured at the PROMPT post-graduation on the web services and concurrent programming modules;

## 2011

Did consulting for Talaris, producing a Windows device driver for proprietary ATM hardware;

## 2010

Gave training at EID during a four-week course on C++ programming tailored for embedded systems programming;

## 2010

Did consulting for Talaris working on the adaptation of a specialized and proprietary Win32 library for the Linux operating system.

Sept 2011     **Software Engineer, SAPO, Portugal Telecom.**

Jun 2012     Worked as a Software Engineer, employing .NET technologies, on the Service Delivery Broker, used internally at Portugal Telecom and at various customers. Mainly worked on the engine that exchanges the messages between the client and the service, providing cross-cutting features such as: data transformation, routing, authentication, authorization, throttling, load balancing, protocol bridging, caching, etc. Refactored the core runtime towards a parallel and asynchronous implementation and developed the distributed throttling and caching features.

Sept 2010     **Teacher Assistant of Computer and Software Engineering, ISEL.**

Nov 2011     Worked as a teacher assistant for software engineering courses, namely on Concurrent Programming, a 5th semester course where students learn threads (using a C implementation of green threads), Java and .NET synchronization, memory models, asynchronous programming and concurrent programming models, and on Software Laboratory, a 4th semester course where students develop a fully-featured Java web application during the whole semester.

May 2011     **Independent Contractor, Google.**

Aug 2011     In the context of the 2011 edition of Google Summer of Code, successfully developed the project "SlimThreading on Mono" with the purpose of enhancing the threading infrastructure of the Mono open source project using a novel synchronization framework (SlimThreading), which, besides being highly efficient, significantly reduces the dependency on operating system services; also refactored the virtual machine implementation of intrinsic locking.

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## Speaking Engagements

Jan 2016     **Challenges in Distributed SDN, FOSDEM 2016, Brussels, Belgium.**

Nov 2015     **MidoNet and the Open vSwitch Datapath, Open vSwitch 2015 Fall Conference, San Jose, California, USA.**

Sept 2015 **Challenges in Distributed SDN**, *LinuxCon Europe*, Dublin, Ireland.

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## Education

2005 – 2009 **BS, Computer and Software Engineering**, *ISEL - Instituto Superior de Engenharia de Lisboa, Portugal*.

### Thesis

title Concurrent Programming Infrastructures

description Obtained the highest grade (20/20) for the final thesis, a project on concurrent programming infrastructures, where he built a user mode scheduler based on the Windows 7 user mode scheduling API and devised a novel technique for user-mode blocking and seamless synchronization of user-mode threads with regular NT threads.

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## Skills

Disciplines Concurrent programming, kernel programming, computer networks, virtualization, distributed systems

Programming Languages C, C++, C#, Rust, Clojure, Java, Scala

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## Languages

Portuguese Native or bilingual proficiency

English Native or bilingual proficiency

Spanish Professional working proficiency

German Limited working proficiency

French Limited working proficiency