europass Curriculum vitae

## PERSONAL INFORMATION

# Luca Martini


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Gender Male | Date of birth 1982/05/03 | Nationality Italian

## CURRENT POSITION

Software Developer in Cynny S.P.A.

## WORK EXPERIENCE

### from 2015/10 to today — Software developer / designer

Cynny S.P.A.

C++ and JavaScript software developer/designer for the Cynny infrastructure. Specifically, I've been working on the development and implementation of:

- the Morphcast technology running in-browser. It is the main Cynny product. A single-page web app, developed fully in javascript ES2015. The most important third-party JS libraries used to develop it comprehend Webpack for the bundling, Karma+Jasmine for the test-driven development and Vue.js for the front-end part.
- Morphcast creator: a desktop app written in C++ and Qt/QML, to demonstrate the possibility for clients to create Morphcast videos. It used the Cynny SDK (see below).
- Cynet: a Chord protocol for a P2P-distributed hash table on the Cynny servers, implemented as a C++ plugin for Node.js, written with libuv and Chrome V8. Its plan was to reliably serve, update and duplicate data, in an environment where many connected nodes could go frequently down. The C++/JS code was written using also CMake, Valgrind (since memory consumption was critical), SQLite for the database management, and Google tests and Mocha (for the unit tests).
- Giotto: an SDK for the Cynny mobile and desktop apps (in C++11). It is the common library all Cynny apps use to communicate with the Cynny servers. This multithreading synchronization middleware was developed using also third-party libraries like CMake, SQLite (for the synchronized internal databse), Djinni (for the interface bindings with Objective-C and Java), and Catch as the testing suite.

Sectors: C++ and JavaScript Software Developing and Design

### from 2014/12 to 2015/10 — Post doc. on experimental physics

University of Pisa & INFN

During this period I spent my time mainly in the following activities:

- Statistical analyses of the LHC collisions (with software written in C++), and consequent publication of experimental physics papers
- R&D on a fast tracking detector for the next generation of LHC (also this in C++)
- Teaching assistant in a master physics course
- Person in charge of part of the CMS software triggers (those relative to the CMS heavy-flavour programme)

The statistical analyses were performed mainly using the CERN C++ROOT library.

Sectors: High Energy Physics, C++ Software Developing, Data Analysis, Group Leadership

### from 2012/12 to 2014/12 — Post doc. on experimental physics

University of Pisa & INFN

Postdoc on L1 trigger software and hardware development for High Luminosity-LHC for the CMS experiment at CERN (CH). During this period I continued my activity in the heavy-flavour studies group. The most important result obtained was the publication of the results for the $B_s^0 \to \mu^+\mu^-$ decay with the combined analyses of the CMS and LHCb data (`https://cds.cern.ch/record/1970675`). This paper was also recently celebrated on the CMS homepage.

The software analyses were performed in C++, mainly using the CERN ROOT statistical framework.

Sectors: High Energy Physics, C++ Software Developing, Data Analysis, Group Leadership

from 2009/09 to 2012/12

### Ph.D. on experimental physics

University of Siena & INFN

Ph.D. student at the CMS experiment at CERN. My work contributed to the publication of the first measurements of the $J/\psi$ and $\psi(2S)$ meson production cross-sections at 7 and 8 TeV, and also to the first observation of the rare decay $B_s^0 \to \mu^+\mu^-$. The observation of the latter is the main topic of my Ph.D. thesis.

During the first half of 2011 I was responsible of the research and development of the Heavy Flavor Physics triggers of CMS.

Sectors: High Energy Physics, C++ Software Developing, Data Analysis

from 2011/01 to 2011/12

### CERN associate

CERN & INFN

Associate position at CERN, CH. During this 1-year position I spent most of the time making analyses for the heavy-flavour group of the CMS collaboration. Besides the publication of the $J/\psi$ and $\psi(2S)$ cross-section measurements, I started to study the feasibility of a measurement of the $B_s^0 \to \mu^+\mu^-$ decay using the first-year CMS data.

I also was part of the analyzers of the triggers (the selection of the collision data on-the-fly) for the heavy-flavour CMS group.

The software analyses were performed mainly in C++and using the CERN ROOT statistical library.

Sectors: High Energy Physics, C++ Software Developing, Data Analysis

## EDUCATION AND TRAINING

2013/12/04

### Ph.D. on experimental physics

EQF level 8

University of Siena (Italy)

Main topics: High Energy Physics, Mathematics, Information Technologies

Final vote: Excellent

2009/07/21

### Master degree on Physics of Fundamental Interactions

EQF level 7

University of Pisa (Italy)

Main topics: High Energy Physics, Mathematics, Information Technologies

Final vote: 110/110 cum laude

2006/02/20

### Bachelor degree on General Physics

EQF level 6

University of Pisa (Italy)

Main topics: Physics, Mathematics, Information Technologies

Final vote: 110/110

## PERSONAL SKILLS

Mother tongue: Italian

| Other languages | UNDERSTANDING | | SPEAKING | | WRITING |
|---|---|---|---|---|---|
| | Listening | Reading | Spoken interaction | Spoken production | |
| English | C1 | C1 | C1 | C1 | C1 |

**Communication skills**
- Excellent communication and public-speaking skills, gained participating as speaker in many international conferences and also as a teacher at university and high-school courses.

**Organizational / managerial skills**
- Sense of organization and team work, acquired during my job experiences
- Leadership, having been responsible of teams of up to ten people

**Computer skills**
- Excellent knowledge (more than seven years) of C++11, including multithreading
- Excellent knowledge (more than two years) of JavaScript including some of its main client and server-side frameworks (see Work Experience above)

**Job-related skills**
- Abstraction and mathematization of problems
- Statistical analysis
- Software developing and design

**Other skills**
- Initiative, desire to do and to learn new things

**Driving License**
- B

## ADDITIONAL INFORMATION

**Publications**
- Co-author in the CMS collaboration (more than 300 published physics papers)
- Single author of four High Energy Physics papers

**Conferences**
- Speaker in seven international Physics conferences

**Honours and awards**
- 2014 Conversi award for best High Energy Physics Ph.D. thesis, by INFN

**LinkedIn profile** `www.linkedin.com/in/luca-martini`

**Processing of personal data** I authorize the use of my personal data