

Alexandre Lopes

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Personal

Date of birth 14 of June 1987
Citizenship Portuguese
Civil status Married

Experience

Professional

- 16 Nov '16 – present **Systems and Software Architect**, *Carl Zeiss SMT GmbH*, Oberkochen, Germany.
- Work package leader for high-NA EUV control system
 - Architect for the new control system for high-NA EUV in-house control system
 - Setting up the necessary toolchains, hardware, documentation and development environment for ARM Cortex-A and ARM Cortex-M based-development
 - ARM Cortex-A and M based software development
 - Parallel computing image processing
- 01 Sep '16 – 15 Nov '16 **Embedded Software Architect**, *Robert Bosch Automotive Steering GmbH*, Schwäbisch Gmünd, Germany.
- Embedded software architecture and development for the new ServoTwin steering system platform (commercial vehicles)
 - Helped two task forces achieve their goal
- 12 Jan '15– Present **R&D Engineer, Software Developer, System administrator**, *Carl Zeiss SMT GmbH (outsourced by Personality IT Stuttgart)*, Oberkochen, Germany.
- Software development for the ARM Cortex A9 / Altera Cyclone V (GNU/Linux and baremetal)
 - Implementation of real-time frameworks (Xenomai, Preempt-RT, RTAI for ARM and x86)
 - GNU/Linux user and kernel space software development
 - Mechatronic systems R&D (incl. Test and project planning and analysis of opto-electrical measurements [among other, white-light interferometer measurements])
 - Development and implementation of software
 - GNU/Linux (Debian) and Solaris sysadmin
- 20 Feb '12 – 31 Oct '14 **System Administrator**, *University of Freiburg*, Freiburg, Germany.
- Implementation and management of, among other, the following server side solutions:
- Linux, Apache, MySQL, PHP (LAMPS)
 - Samba shares

- Wiki (using MediaWiki)

Dec '08 – Apr '10 **Undergraduate's Tutor**, *Escolha Múltipla*, Aveiro, Portugal.

Subjects taught:

- Electromagnetism
- Electronics
- Mechanics
- Quantum Mechanics

Academic

2012 – 2014 **Teaching Assistant**, *University of Freiburg*, Freiburg, Germany.

Subjects:

- Analytical Mechanics (Summer 2014)
- Mechanics (Winter 2013/14)
- Electrodynamics (Winter 2012/13)

01 Nov '10 – **Researcher**, *Theory of Condensed Matter - IMM*, *Radboud University Nijmegen*,
01 Dez '11 The Netherlands.

- The Self Consistent Screening Approximation in the membrane behavior of graphene.

Voluntary

01 – 15 Aug '07 **Volunteers**, *Instituto Português da Juventude*, Program youth volunteer work for the forest, Oliveirinha, Portugal.

- Volunteer work to help protect the Portuguese forest

22 – 27 Jul '07 **Assistant**, *Summer Academy - Department of Physics*, *University of Aveiro*, Portugal.

- Teaching of experimental holography to high school students

23 – 28 Jul '06 **Assistant**, *Summer Academy - Department of Physics*, *University of Aveiro*, Portugal.

- Teaching of experimental holography to high school students

26 – 30 May '05 **Assistant**, *Associação Juvenil de Ciência*, XI Meeting of Young Researchers, Fundão, Portugal.

- Assistant in the organization of a youth scientific meeting

16 – 20 Apr '04 **Assistant**, *Associação Juvenil de Ciência*, X Meeting of Young Researchers, Aveiro, Portugal.

- Assistant in the organization of a youth scientific meeting

Academic Background

20 Feb '12 – **PhD in Theoretical Physics**, *University of Freiburg*, Germany.

20 Apr. '15

- Thesis title: Pure univariate quantum marginals and electronic transport properties of geometrically frustrated systems
- Advisor: David Gross

15 Sep '08 – **Master in Physics**, *University of Aveiro*, Portugal, *Grade: 18/20 (First Class Honours)*.

- Thesis title: *Electronic, thermodynamic and transport properties of the diamond chain*
- Advisor: R.G. Dias
- Top ranked student

03 Oct '05 – **Bachelor in Physics**, *University of Aveiro*, Portugal, *Grade: 17/20 (First Class Honours)*.

- Thesis title: *Aharonov-Bohm effect and persistent currents in quantum rings*
- Advisor: R.G. Dias
- Best student '08

Education and Training

Aug – Sep 2010 **Trainee**, *HP University*, Paço de Arcos, Portugal.

Training in:

- HP technology
- Markets
- Presentation techniques
- Sales and Negotiation

2005 – 2010 **Music Student**, *Conservatory of Music of Aveiro - Calouste Gulbenkian*, Portugal.

Musical instrument:

- Classical Guitar

06 – 12 Aug '06 **Participant**, *1st International Science Summer Camp '06*, Uppsala, Sweden.

Topic:

- Energy and the Environment

01 – 12 Aug '05 **Intern**, *Rutherford's Experiment*, Portuguese Nuclear and Technological Institute (ITN), Sacavém, Portugal.

Objectives:

- Analysis of zinc implanted sapphire using *Rutherford Backscattering Spectroscopy*

18 – 29 Jul '05 **Intern**, *Experimental Holography*, Department of Physics, University of Aveiro, Portugal.

Objectives:

- Reflexion and transmission holography, multi-exposure holography, single and double beam set-ups and other

19 – 30 Jul '04 **Intern**, *Experimental Holography*, Department of Physics, University of Aveiro, Portugal.

Objectives:

- Reflexion and transmission holography, multi-exposure holography, single and double beam set-ups and other

30 Jun – 11 Jul '03 **Intern**, *Experimental Holography*, Department of Physics, University of Aveiro, Portugal.

Objectives:

- Reflexion and transmission holography, multi-exposure holography, single and double beam set-ups and other

Awards and Scholarships

2010 – 2014 **Doctoral scholarship (BD)**, *Fundação para a Ciência e a Tecnologia*, Portugal.

2013 **Funding for conference participation**, *Wilhelm und Else Heraeus-Stiftung*, Germany.

2010 **Scientific initiation scholarship (BIC)**, *Department of Physics, University of Aveiro*, Portugal.

Topic:

- Numerical and analytical study of magnetic and transport phenomena in low dimensional electronic systems with strong correlations

2008 – 2009 **Scientific initiation scholarship (BIC)**, *Department of Physics, University of Aveiro*, Portugal.

Topic:

- Initiation to the characterization and manipulation of nanostructures using AFM and NSOM

2008 **Best Student '08**, *Department of Physics, University of Aveiro*, Portugal.

2007 **Award**, *Best Idea of the Year Awards*, Toledo, Spain.

Description:

- European Winner, Category *Innovate your Planet*
- Portugal/Center winner, Category *Innovate your Planet*

2005 **Award - Medal/Certificate**, *17th European Union Contest for Young Scientists*, Bauman University, Moscow, Russia.

Description:

- Award to distinguish the quality of the project at the final of the contest

2005 **Prize**, *Youth Science Association (AJC)*, Lisbon, Portugal.

Description:

- Fifth place in the contest *Youth Science Meeting (EJC)*

2005 **Prize**, *Fundação da Juventude*, Lisbon, Portugal.

Description:

- Second prize in the contest *Young Scientists and Investigators*
- Selected to participate in the final of the 17th *European Union Contest for Young Scientists*

Languages

Self-assessment European level CEFR (C2 maximum evaluation)

		Comprehension		Speaking		Writing
		Listening	Reading	Interaction	Production	
Portuguese	Mother Tongue	-	-	-	-	-
English	Near-native	<i>C2</i>	<i>C2</i>	<i>C2</i>	<i>C2</i>	<i>C2</i>
German	Advanced	<i>C1</i>	<i>C1</i>	<i>C1</i>	<i>C1</i>	<i>C1</i>
Spanish	Advanced	<i>B2</i>	<i>B2</i>	<i>B2</i>	<i>B1</i>	<i>A2</i>
French	Beginner	<i>A2</i>	<i>A2</i>	<i>A2</i>	<i>A2</i>	<i>A2</i>

2010 **Academic IELTS test.**

- Listening 8.5
- Reading 8.5
- Writing 7.0
- Speaking 7.5
- Overall 8.0

Computer skills

Number of years of continuous experience between parenthesis.

Programming Languages	Assembly (ARM) (2), Bash shell scripting (10+), Fortran (2), C/C++ (10), JavaScript (3), Matlab (10+), PHP (3), Python (10+)
Parallel Programming	Apache Storm, CUDA, OpenCL, OpenMP, OpenMPI
Programming Tools	Doxygen, Eclipse, GNU Toolchain, UML, Visual Studio
Markup Languages	CSS, HTML, L ^A T _E X, XHTML
Operating systems	GNU/Linux, Microsoft Windows, Solaris
Other	CadSoft Eagle, CORBA IDL Inkscape, Git, Mathematica, Subversion, Vim, VHDL, Yocto Project
Well-known libraries	lwIP, OpenCV, SDL

Publications

A A Lopes and R G Dias. Simple approach for the two-terminal conductance through interacting clusters. *arXiv:1402.5922 [cond-mat.mes-hall]*, 2014.

A. A. Lopes, B. A. Z. António, and R. G. Dias. Conductance through geometrically frustrated itinerant electronic systems. *Phys. Rev. B*, 89:235418, Jun 2014.

B A Z António, A A Lopes, and R G Dias. Transport through quantum rings. *European Journal of Physics*, 34(4):831, 2013.

A. A. Lopes and R. G. Dias. Interacting spinless fermions in a diamond chain. *Phys. Rev. B*, 84(8):085124, Aug 2011.

M. Facão, A. Lopes, A. L. Silva, and P. Silva. Computer simulation for calculating the second-order correlation function of classical and quantum light. *Eur. J. Phys.*, 32(4):925, 2011.

Poster Presentations

8 – 12 Oct '12 *Itinerant interacting spinless fermions in an AB2 chain*, Correlations and coherence in quantum systems, University of Évora, Portugal

21 – 25 May '12 *Itinerant interacting spinless fermions in an AB2 chain*, Itinerant Spin-Orbital Systems: From Magnetic Frustration to Novel Superconductivity, MPIPKS Dresden, Germany

18 May '12 *Itinerant interacting spinless fermions in an AB2 chain*, Andrejewski Day, University of Freiburg, Germany

Talks

18 – 22 Mar '13 *Witnessing genuine entanglement in multi-partite systems from local information: possible but hard*, DPG Spring Meeting, Leibniz Universität Hannover, Germany

Scientific conferences/workshops/meetings attended

18 – 22 Mar '13 DPG Spring Meeting, Leibniz Universität Hannover, Germany

21 – 25 Jan '13 16th Workshop on Quantum Information Processing, Tsinghua University Beijing, China

8 – 12 Oct '12 Correlations and coherence in quantum systems, University of Évora, Portugal

1 – 6 Jul '12 Quantum Information Workshop, Seefeld, Austria

18 – 22 Jun '12 2nd AQUA Student Congress on Quantum Information & Computation, University of Waterloo, Canada

21 – 25 May '12 *Itinerant Spin-Orbital Systems: From Magnetic Frustration to Novel Superconductivity*, MPIPKS Dresden, Germany

18 May '12 Andrejewski Day, University of Freiburg, Germany

12 – 16 Mar '12 DPG Spring Meeting, University of Stuttgart, Germany

11 – 15 Oct '10 Quantum coherence and correlations in condensed-matter and cold-atom systems, University of Évora, Portugal

5 – 9 Jul '10 Emergence of new states of matter in magnetic systems and beyond, ICTP Trieste, Italy

Own projects

2004 **Author and Developer**, *CometZ*, Open source side scroller (available on *SourceForge*).

Other

4 Apr '06 **Speaker**, in the seminar "*Science and Innovation*" by invitation of the Secretary of State for Youth and Sports, Portugal.

11 Nov '05 **Congratulated**, by Maria da Conceição Peleteiro, Vice-President of the *Fundação para a Ciência e a Tecnologia* for the project in the final of the contest "17th European Union Contest for Young Scientists", Portugal.

31 Aug – 01 Sep '05 **Participant**, *23rd Youth Science Meeting*, Associação Juvenil de Ciência, Lisbon, Portugal.

01 – 10 Sep '04 **Participant**, *XXII Youth Science Meeting*, Associação Juvenil de Ciência, Lisbon, Portugal.

Driver's License

May 2006 European driver's license, category B

Miscellaneous

2003 – Present Administering my own GNU/Linux server, which I used to use to perform several experiments and host my website