

## João Carlos Arnauth Pela

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### CONTACT INFORMATION

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### PERSONAL STATEMENT

I am a experimental physicist with a strong background in data analysis and engineering. I have worked for several years in data reduction, analysis and interpretation. This work has been made within a large collaboration using purpose built software in C++ and Python. Additionally, I have designed software for a high event rate real-time monitoring system with millions of input channels. My professional interests are in solving complex problems in the areas of high energy physics, data Analysis, instrumentation, detector design and simulation.

### SCIENTIFIC PROFESSIONAL EXPERIENCE

**Imperial College London**, London, United Kingdom

*Ph.D. Student at the CMS Experiment at the LHC* **Jan 2012 to Dec 2015**

- Member of the VBF Higgs to Invisible analysis group. Responsible for the cross check analysis for the our publication with full Run I parked data.
- Designed the trigger algorithm for both the 2012-13 and 2015 analyses.
- Provided service work as: Trigger Shifter and Trigger Field Manager.
- Member of the Higgs to  $\gamma\gamma$  analysis group. Worked on fit function systematics determination and on the Higgs spin analysis.

**CERN - European Organization for Nuclear Research**, Geneva, Switzerland

*CMS L1T Data Monitoring Quality Coordinator* **Jul 2012 to Jun 2014**

- Coordination of a group of 5 people with the task of maintaining high operational standards the the CMS Level 1 Trigger system.
- Responsible for the real time monitoring of a mission critical system.
- Responsible for the data quality certification for physics usage.

**CERN - European Organization for Nuclear Research**, Geneva, Switzerland

*Engineer/Physicist for the CMS Experiment at the LHC* **Feb 2011 to Dec 2012**

- Design and implementation of monitoring tools for the Level 1 Trigger in the framework of the Data Quality Monitoring (DQM) system. Resulting work is used for online monitoring and data quality certification.
- A shift as CMS Shift Leader (collisions) **Aug 2011**
- Several shifts as CMS Online Trigger Shifter **Aug 2011 to Dec 2011**

**Laboratório de Instrumentação e Física Experimental de Partículas**, Lisbon, Portugal

*Junior Researcher for the CMS Experiment at the LHC* **2007 to 2010**

- Coordinator and developer of the EXOTripleton Exercise for CMS Exotica group as a part of 2009 October Exercise with the objective of testing LHC Data Flow Model **Oct 2009**
- Several shifts as CMS-ECAL Barrel, Endcaps and Safety Shifter, during the CRAFT 2009 (cosmics) program. **Aug 2009**
- Design and implementation of method for studying potential for Universal Extra Dimensions with a four lepton final state. **Dec 2008 to 2010**

- Design and implementation of method for studying  $t\bar{t}$  in semileptonic and fully leptonic with hadronic  $\tau$  channels **Set 2007 to Dec 2008**

**Centro de Fusão Nuclear**, Lisboa, Portugal

*Experimental Physist*

**2003 to 2004**

- Design and test of a PCB Board to implement the new system of slow control of the ISTOK Tokamak Fusion Reactor based in CAN technology.

TEACHING  
EXPERIENCE

**Imperial College London**, London, United Kingdom

*Demonstrator at the Physics 1<sup>st</sup> Year Laboratories*

**Sep 2014 to Jun 2015**

- Demonstrator in Demonstration Experiments and Electronics.
- Marking of two cycles of reports.
- Supervision of two final year projects.
- Received a FoNS Excellence Award for this work.

SUPERVISION  
EXPERIENCE

**CERN - European Organization for Nuclear Research**, Geneva, Switzerland

*Summer students Project*

**Jun 2011**

- Design and implementation of monitoring tools for the Level 1 Trigger in the framework of the Data Quality Monitoring (DQM) system.
- Development of an algorithm to detect dead areas or spikes in the Level 1 Trigger trigger primitives.

OUTREACH  
EXPERIENCE

**CERN - European Organization for Nuclear Research**, Geneva, Switzerland

*CERN official guide*

**Jun 2011 to Jun 2014**

- Certified guide for 6 visits itineraries: ATLAS visiting center, LHCb surface area, CAST experiment, SM18 accelerator complex, LINAC & LEIR and Computing Centre.
- Guided over 50 visits including VIP guests and press.

**CERN - European Organization for Nuclear Research**, Geneva, Switzerland

*CMS experiment official guide*

**Jun 2011 to Jun 2014**

- Certified for guiding visit into the CMS experiment radiation controlled underground areas.
- Guided over 50 visits including VIP guests and press.

EDUCATION

**Imperial College London**, London, United Kingdom

Ph.D., Experimental Particle Physics

**Dec 2015**

- Thesis Topic: Search for Higgs Decay to Dark Matter and Trigger Studies
- Supervisor: [Professor David Colling](#)
- Area of Study: Experimental Particle Physics

**Instituto Superior Técnico, Lisboa, Portugal**

M.S., Engineering Physics and Technology **Oct 2010**

- With final grade of 90% (Excellent)
- Thesis Topic: Multi-Lepton Final States in the Search for New Physics at the Large Hadron Collider
- Supervisor: [Professor João Varela](#)
- Co-Supervisor: [Michele Gallinaro](#)
- Area of Study: Experimental Particle Physics

B.S., Engineering Physics and Technology **Feb 2009**

- With final grade of 70% (Good)
- Engineering specialization (emphasis on Instrumentation)

AWARDS &  
GRANTS

**Prize for Excellence in the Support of Teaching & Learning** **May 2015**

- Awarded to individuals who have made a major contribution to the support of learning and teaching within the Faculty of Natural Sciences at Imperial College London.

**Faculty of Natural Sciences Student Award for Best Demonstrator** **May 2015**

- Awarded to the most voted elements of staff in each category. Obtained for my work demonstrating at the Physics 1<sup>st</sup> Year Laboratories.

**Development of Excellence in Sport Grant** **Sep 2012 to Jun 2015**

- Awarded by Imperial College London to high achieving athletes
- Received for 3 consecutive years

**PhD Grant - Fundação para a Ciência e Tecnologia** **Jan 2012**

- Offered by the Fundação para a Ciência e Tecnologia (governmental funding agency)
- Offered a fully paid grant for pursuing a Ph.D. program at Imperial College London.
- Ranked at top 10% applicants.

**Engineer Internship Grant - Agencia de Inovação** **Jan 2011**

- Offered by the Agencia de Inovação (Portuguese governmental agency)
- Awarded a paid engineer internship position at the CMS experiment at CERN.
- Ranked at top 10% applicants.

PUBLICATIONS

*Thesis*

- Multi-Lepton Final States in the Search for New Physics at the Large Hadron Collider, João Carlos Arnauth Pela, 2010, Instituto Superior Técnico

*Public results*

- CMS collaboration, Search for invisible decays of Higgs bosons in the vector boson fusion production mode, 2014, CMS-PAS-HIG-14-038
- CMS collaboration, Search for invisible decays of Higgs bosons in the vector boson fusion and associated ZH production modes, 2013, CMS HIG-13-030, arXiv:1404.1344

*CMS Technical Design Reports*

	<ul style="list-style-type: none"> <li>• CMS collaboration, <i>CMS Technical Design Report for the Level-1 Trigger Upgrade</i>, 2013, CERN-LHCC-2013-011 CMS-TDR-12 (Author and Chapter Editor)</li> </ul>	
CONFERENCE & ACADEMIC SCHOOLS	<ul style="list-style-type: none"> <li>• European School of High-Energy Physics 2015 - Participation</li> <li>• Institute of Physics Joint High Energy Particle Physics and Astro Particle Physics Groups Annual Meeting 2014 - Presentation</li> <li>• STFC HEP Summer School 2012 - Poster</li> <li>• PASC Winter School 2008 (Presentation)</li> </ul>	
COURSES AND CERTIFICATIONS	<p>ITC Certificate in First Aid for Sport, Exercise &amp; Fitness</p> <p>Level 1 Mechanical Workshop Course,</p> <ul style="list-style-type: none"> <li>• Basic use and construction techniques with mechanical workshop tools and machines.</li> </ul> <p>IELTS Academic language test: Overall band 7.0 (good user)</p>	<p><b>Nov 2014</b></p> <p><b>Jun, 2010</b></p> <p><b>Feb, 2010</b></p>
ACADEMIC SOCIETIES	<p><b>Imperial College London</b>, London, United Kingdom</p> <p>Imperial College London Judo Club</p> <ul style="list-style-type: none"> <li>• Club committee member</li> <li>• Men team captain</li> </ul> <p><b>Instituto Superior Técnico</b>, Lisboa, Portugal</p> <p>NFIST (IST Physics Students Association) Member</p> <ul style="list-style-type: none"> <li>• Development and implementation of School Registration Web Application for <i>Physics Week 11</i> and <i>Physics Week 12</i> at IST</li> <li>• Development and implementation of an integrated system of mailing lists, library and forum</li> <li>• Responsible and developer of many activities Web Site (Social Activities and Outreach).</li> </ul> <p>National Physics Students Meeting 2008</p> <ul style="list-style-type: none"> <li>• Member of the organization committee</li> <li>• Development and implementation of all the website's applications, including Student Registration, Forum, News Portal, etc</li> </ul>	<p><b>2014-15</b></p> <p><b>2014-15</b></p>
OTHER PROFESSIONAL EXPERIENCE	<p>Web Designer</p> <ul style="list-style-type: none"> <li>• Designed commercial web sites for 2 small companies</li> </ul> <p>IT System Administrator</p> <ul style="list-style-type: none"> <li>• At a small local sports club during 2 years</li> </ul> <p>Summer Camp Counsellor</p> <ul style="list-style-type: none"> <li>• Organized by Borough of Benfica, Lisbon</li> <li>• Looked after +30 children</li> <li>• Responsible for the Judo classes</li> </ul>	<p><b>2004</b></p> <p><b>2004</b></p> <p><b>2002</b></p>

CITIZENSHIP            Portuguese (European Union)

LANGUAGE SKILLS

Portuguese: Native or bilingual proficiency  
English: Native or bilingual proficiency  
French: Full professional proficiency  
Spanish: Professional working proficiency

TECHNICAL SKILLS

Extensive programming experience in several languages:

- Object Oriented: C++, Python, Java
- Imperative: C, Fortran
- Hardware: Verilog, VHDL, Assembler
- Database: MySQL
- Web oriented: HTML, PHP, CSS, Javascript, XML
- Others: Mathematica, LaTeX

Familiar with common software versioning systems: Git, SVN and CVS

User level experience with productivity software like Microsoft Office and Open Office.

Operating Systems: Linux (administration knowledge), Microsoft Windows

Driver's Licence for motorcycle (all A classes) and cars (B class)

SPORTS

EXPERIENCE

Judo

Awards

- 2<sup>nd</sup> Degree black belt - 2<sup>nd</sup> Dan **2007**
- Level 2 Coach in Portugal **2007**
- Level 2 Coach in the United Kingdom **2015**
- Portuguese Regional Referee level **2008**

Selected Competition Results

- 5<sup>th</sup> British University Championship (individuals) **2014-15**
- 1<sup>th</sup> London University Open (individuals) **2013**
- 2<sup>nd</sup> Portuguese University Championship (individuals) **2005-06**
- 3<sup>rd</sup> Portuguese University Championship (individuals) **2004-05**
- 3<sup>rd</sup> Portuguese National Kata Championship **2007**

Coaching Experience

- Second coach - Imperial College London University Judo Club **2014-2015**
- Invited coach - Judo Club Meyrin, Geneva, Switzerland **2012-2014**
- Second coach - Externato Champagnat, Lisboa, Portugal **2006**
- Main coach - Parque Colombo Gym, Lisboa, Portugal **2005**