

# Vasco Amaral's Curriculum Vitae

FCT/UNL  
September 2007

## CV Abstract

Vasco Amaral is, since 2005, Assistant Professor at Universidade Nova de Lisboa. He studied in Portugal (where he was born and raised) at the Instituto Superior Tecnico, where he got the title of “Eng. Informatico e de Computadores”. His first university degree was taken in 1998 on Software and Computer Engineering and he did his after course traineeship at the INESC laboratory in Lisbon.

In 1999 Vasco worked for CERN (European Organization for Nuclear Research) for four months as a software engineer and developer. There, he was involved with the ATLAS (A Thoroidal LHC Apparatus) experiment. While working for ATLAS, Vasco collaborated with the Faculdade de Ciências da Universidade de Lisboa and LIP (Laboratorio de Instrumentação e Física Experimental de Partículas).

From 1999 to 2003, Vasco was responsible coordinator of the database group at the High Energy Physics Experiment named Hera-B, in DESY Hamburg. Still collaborating with the previous mentioned portuguese institutions, he has also collaborated with the Universidade de Trás-os-Montes e Alto Douro and University of Sofia, Bulgary, as supervisor for several diploma thesis.

In 17th of February 2005 defended his Ph.D. thesis at the University of Mannheim, Germany, with the supervisor Prof. Dr. Guido Moerkotte. His task was to carry out research on methodologies to increase performance, specially concerning to productivity, to the data-mining phase in High Energy Physics experiments. His Ph.D. thesis consisted on developing and formalizing a domain specific visual query language (project PHEASANT).

In 2006 became member of the CITI ( Centro de Informática e Tecnologias de Informação) research center within the research group PLM (Programming Languages and Modeling).

In 2007 was elected, and is still nowadays, member of the representative committee of Colégio de Informática (Portuguese southern region) of Ordem dos Engenheiros (which is a portuguese association equivalent to associations of software engineers like ACM, or IEEE).

From Setember 2007 until January 2008 was invited professor at CUI, university of Geneva.

In 2007 became the first researcher of UNL to collaborate with a CERN experiment (ATLAS).

Vasco, besides the educational aspects, feels specially attracted by model based approaches for the development and modeling of reliable software, (implying the design of DSLs, development of formal frameworks and techniques that lead to the development of tools for rapid-prototyping in software intensive domains). Other topics he also very interested in are related to Database Management Systems, (specially query languages, query optimization and database implementation details).

This CV presents details on Vasco's Education, Employment history, Research and teaching interests, publications, and other relevant information concerning his professional life.

### **Employment History**

2007-2008 Invited Professor at CUI University of Geneva.

2005 Assistant Professor at the Universidade Nova de Lisboa, Lisbon, Portugal.

2002-2005 Ph.D. Student in the Database Department of the University of Mannheim, supervised by Prof. Dr. Guido Moerkotte. Grant funded by the Portuguese Foundation for Science and Technology FCT ref. SFRH / BD / 8918 / 2002

2000-2003 Coordinator of the database group of the experiment HERAB, in the international laboratory of DESY Hamburg, Germany. The work involved maintaining, re-engineering the systems, design new solutions and coordination of the interface to the other subsystem groups.

1998-1999 Research collaborator at the Portuguese LIP-Lisbon group project ATLAS, with the project manager Prof. Dr. Amelia Maio. Also collaborator at the Centro de Física Nuclear da Universidade de Lisboa, CFNUL. The project involved studying design/engineering solutions for managing a data logging system of the detector while acquiring data, under supervision of Prof. Dr. Antonio Amorim, in the group Back-end at the ATLAS collaboration project at CERN, Geneva, Switzerland.

1998-2004 Research collaborator at the Portuguese LIP-Coimbra group project Hera-B, with Prof. Dr. João Carvalho as project manager. Involved interfacing and representing the portuguese collaboration in the experiment. Several tasks like responsibility at the experiment's control of the data acquisition were taken.

1997-1998 Internship at INESC (Instituto de Engenharia e de Sistemas), Portugal, as part of the nal project for the University degree. The project named ABACUS consisted on developing a spreadsheet for the Linux platform.

### **Published Articles (Journal)**

2007, "K\*0 and PHI meson production in proton-nucleusinteractions at  $S^{1/2} = 41.6$ -GEV",Hera-B collaboration, The European Physical Journal C - Particles and Fields - April

2007, "A measurement of the Psi-Prime to J / PSI production ratio in 920-GEV proton-nucleus interactions", Hera-B collaboration, The European Physical Journal C - Particles and Fields - January

2007, "Improved measurement of the B-anti-B production cross section in 920-GEV fixed-target proton-nucleus collisions", Hera-B collaboration, Physical Review D

2006, "Polarization of Lambda and anti-Lambda in 920-GEV fixed-target proton-nucleus collisions", Hera-B collaboration, Physics Letters B - June

2006, "Measurement of the Upsilon production cross-section in 920-GEV fixed-target proton-nucleus collisions", Hera-B collaboration, Physics Letters B - June

2006, "Measurement of the J/PSI production cross section in 920-GEV/C fixed-target proton-nucleus interactions", Hera-B collaboration, Physics Letters B

2005, "Charm, beauty and charmonium production at HERA-B", By HERA-B Collaboration. Prepared for International Conference on Hard and Electromagnetic Probes of High Energy Nuclear Collisions (HP 2004), Ericeira, Portugal, 4-10 Nov 2004. Published in Eur.Phys.J.C43:179-186,2005.

2005 "The Outer Tracker Detector of the HERA-B Experiment Part I: Detector", Hera-B collaboration, Nucl. Instr. and Meth. A 555 (2005) 310.

2005 " Measurement of the J/psi production cross section in 920-GeV/c fixed-target proton-nucleus interactions". By HERA-B Collaboration (I. Abt et al.). DESY-05-232, December , 19pp. Published in Phys.Lett.B638:407-414,2006. e-Print Archive: hep-ex/0512029

2005, "Improved measurement of the b-anti-b production cross section in 920-GeV fixed-target proton-nucleus collisions". By HERA-B Collaboration (I. Abt et al.). DESY-05-233, Dec 2005. 22pp. Published in Phys.Rev.D73:052005,2006. e-Print Archive: hep-ex/0512030

2004 "Engineering a New Abstraction Layer to Optimize the HEP Analysis Process", V. Amaral, S. Helmer, G. Moerkotte, IEEE Transaction in Nuclear Sciences Journal (TNS), ISSN: 0018-9499, CODEN:IETNAE, volume 51, number 4, August 2004, pp.1441-1448

2004 "PHEASANT: A Physicist's EASy ANalysis Tool", V. Amaral, S. Helmer, G. Moerkotte, Springer Verlag, Lecture Notes in Artificial Intelligence (LNAI), ISSN:0302-9743, ISBN:3-540-22160-3, 3055:229-242, 2004.

2004, " Limits for the central production of Theta+ and Xi-- pentaquarks in 920-GeV pA collisions". By HERA-B Collaboration (I. Abt et al.). DESY-04-148, Aug 2004. 5pp. Published in Phys.Rev.Lett.93:212003,2004. e-Print Archive: hep-ex/0408048

2004 "Search for the flavor changing neutral current decay  $D_0 \rightarrow \mu^+ \mu^-$  with the HERA-B detector", Hera-B collaboration, Phys.Lett.B (Physics Letters B), ISSN:0370-2693, 596:173-183,hep-ex/0405059, May 2004

2003 "J / Psi production via Chi(C) decays in 920-GeV pA interactions", Hera-B collaboration, hep-ex/0211033, Phys. Lett. B(Physics Letters B), ISSN: 0370-2693, 561:61-72, 2003.

2003 "Measurement of the B anti-B production cross-section in 920-GeV fixed target proton nucleus collisions", Hera-B collaboration, DESY-02-076, May, Eur.J.Phys.C (European Physics Journal C) Eur.Phys.J., ISSN:1434-6044, 26:345-355,2003

2003 "Inclusive  $\psi(0)$  production cross sections from 920 GeV fixed target proton-nucleus collisions", Hera-B collaboration, DESY-02-213, DEC. 2002, Eur.J.Phys.C, ISSN:1434-6044, hep-ex/0212040, 29:181-190,2003

2001 "The HERA-B database services for detector configuration, calibration, alignment, slow control and data classification", A. Amorim, V. Amaral, U. Marconi, S. Steinbeck, A. Tomé, V. Vagnoni, H. Wolters, ISSN: 0010-4655, Elsevier Science, Computer Physics Communications, Volume 140, Issues 1-2,15 October 2001, Pages 172-178

## **Books**

"Programação em Perl" (Programming Perl), Levi Lúcio, Vasco Amaral. First edition in October 2001 by FCA editora/Lidel, in Portugal, ISBN 972-722-251-X.

## **Dissertations**

2005, "Increasing productivity in High Energy Physics data mining with a Domain Specific Visual Query Language" Phd Thesis @ University of Mannheim - February

## **Editorial activities**

2007, "Principles and Practice of Programming in Java", Proceedings of the 5<sup>th</sup> conference PPPJ 2007, Vasco Amaral, Luís Marcelino, Luís Veiga and Conran Cunningham, ACM Press (ISBN 978-1-59593-672-1)

## **Published proceedings**

2007, "Towards a full implementation of a robust solution of a Domain Specific Visual Query Language DSVQL for HEP analysis", CHEP2007 12th International Conference on Computing in High Energy and Nuclear Physics - September

2007, "Towards a formal, model-based framework for control systems interaction prototyping ", RISE 2006 International Workshop on Rapid Integration of Software Engineering techniques 13-15 September

2007, "(H)ALL: a DSVL for designing user interfaces for Control Systems.", Proceedings of the 5th Nordic Workshop on Model Driven Engineering NW-MoDE 2007 27-29 August

2006, "I-UsE: Integrated Usability Evaluation Environments", Interacção 2006 - October

2005, "Formally Specifying the Syntax and Semantics of a Visual Query Language for the Domain of High Energy Physics Data Analysis", IEEE Symposium on Visual Languages and Human-Centric Computing - October

2004 "Domain Specific Visual Query Language for HEP analysis or How far can we go with user friendliness in HEP analysis?", V. Amaral, S. Helmer, G. Moerkotte, Proc. CHEP'04, 27 September-1 October, Interlaken, Switzerland.

2003 "A Domain Specific Visual Query Language for the High Energy Physics Environment", V. Amaral, S. Helmer, G. Moerkotte, Proc. 3rd OOPSLA Workshop on Domain-Specific Modeling (DSM), ISBN: 951-39-1582-4/ISSN: 1239-291X , Anaheim, California, USA, 2003: 9-16.

2003 "Designing and Implementing a New Abstraction Layer to Optimize the HEP Analysis Process", V. Amaral, S. Helmer, G. Moerkotte, IEEE Nuclear Sciences Symposium NSS, October 20-24, Conference Record N26-104, ISSN: 1082-3654, ISBN(CD-ROM):0-7803-8258-7, ISBN(SoftBound):0-7803-8258-7,Portland, Oregon, USA.

2003 "A Visual Query Language for HEP Analysis", V. Amaral, S. Helmer, G. Moerkotte, IEEE Nuclear Sciences Symposium NSS, October 20-24, Conference Record N26-105, ISSN: 1082-3654, ISBN(CD-ROM):0-7803-8258-7, ISBN(SoftBound):0-7803-8258-7, Portland, Oregon, USA.

2001 "Operational experience running the Herab-B database system", Vasco Amaral, A. Amorim et. al Proc. of CHEP'01, International Conference on Computing in High Energy and Nuclear Physics (Sept.2001), Beijing/CHINA, ISBN:1-880132-77-X, Science Press 6-11:396-397, 2001.

2001 "Studies for optimization of data analysis queries for HEP using HERA-B commissioning data", Vasco Amaral, A. Amorim, et. al. Proc. of CHEP'01, International Conference on Computing in High Energy and Nuclear Physics (Sept.2001), Beijing/CHINA, ISBN:1-880132-77-X, Science Press 3-10:154-155.

2000 "The Hera-B database management for detector configuration, calibration, alignment, slow control and data classification", Proc. of CHEP'00, International Conference on Computing in High Energy and Nuclear Physics (Feb. 2000), editor Mirco Mazzucato INFN Padova, Padova/Italy.

2000 "Impact of Software Review and Inspection", Proceedings CHEP2000, International Conference on Computing in High Energy and Nuclear Physics, editor Mirco Mazzucato INFN Padova, Padova/Italy.

2000 "Performance and scalability of the back-end DAQ sub-system", Proc. of CHEP'00, International Conference on Computing in High Energy and Nuclear Physics (Feb.2000), editor Mirco Mazzucato INFN Padova, Padova/Italy.

### **Technical Reports**

2007, "Survey of the state-of-the-art in Requirements Engineering for Software Product Line and Model-Driven Requirements Engineering", Jasna Kovacevic, Mauricio Alferez, Uira Kulesza, Ana Moreira, Joao Araujo and Vasco Amaral, AMPLE Aspect-Oriented, Model-Driven, Product Line engineering Specific Targeted Research project: IST-33710

2006, "Rapid Prototyping of User Interfaces for Control Systems: A Survey", Centre Universitaire d'Informatique de l'Université de Geneve

### **Ongoing Research Projects involved**

**AMPLE** – collaborator - Aspect-Oriented, Model-Driven Product Line Engineering coordinating institution Lancaster University , EU funded project, 3,7 Million Euros, with 9 partner institution - [ Oct 2006 - Sep 2009 ].

**PHEASANT**- Coordinator - Physicists EASy Analysis Tool UNL.

**BATIC3S** – Coordinator [ Dec 2007- Dec 2010 ] of the Portuguese collaboration group of the project "Building Adaptive Three-dimensional Interfaces Collaboration" (140 thousand Euros). This project is an international collaboration with Ecole d'Ingenieur de Genève (coordinators of the Swiss groups) and Centre Universitaire d'Informatique de l'Université de Genève (264 thousand Euros) - [ Oct 2005 - Oct 2008 ]. The ATLAS experiment of CERN is also collaborating with the project as an important case study.

## Past Research Projects involved

**ATLAS** - Particle Physics experiment, 164 partner institutions, 1900 collaborators, coordinated by CERN – [1990-2010]

**HERA-B** - Particle Physics experiment, 32 partner institutions, 250 collaborators, coordinated by DESY/Hamburg -[1990-2004].

**ABACUS** - Small and light to use Spreadsheet, Open Source project, INESC / IST Portugal [1998].

## External Talks

27/4/2007, AMPLE WP4 - task 4.2.3 report, Project Meeting Talk, University of Darmstadt.

26/4/2007, AMPLE WP4 - task force meeting - UNL team view, Project Meeting Talk, University of Darmstadt.

31/10/2006, AMPLE WP2 - Kick-off Meeting - UNL point of view, Project Meeting Talk, University of Lancaster.

17/4/2005, CAMPaM workshop - Personal research vision for CAMPaM tools, Research Talk, Canadian University McGill University's official Bellairs Research Institute in Barbados.

28/5/2004 , "Pheasant presentation in FQAS", Seminar, University of Mannheim, Germany.

17/5/2004 "Developing a Domain Specic Visual Query Language for High Energy Physics data mining", Seminar, University of Geneve, Switzerland.

12/12/2003 "Pheasant: Usability Evaluation", Seminar, Institute fur Informatik, University of Mannheim, Germany.

11/7/2003 "Optimizing Object Queries Using an Eective Calculus", Seminar, Institute fur Informatik, University of Mannheim, Germany.

10/4/2003 "A Domain Specic Visual Query Language for High Energy Physics analysis", Seminar, Institute fur Informatik, University of Mannheim, Germany.

17/1/2003 "High Energy Physics analysis data model", Seminar, Institute fur Informatik, University of Mannheim, Germany.

12/2002 "Visual Query Languages: a Survey", Seminar, Institute fur Informatik, University of Mannheim, Germany.

18/7/2002 "Database System Overview", Seminar, Summer School, DESY, Hamburg, Germany.

22/12/2001 "Arquitectando e administrando BDs em Hera-B,VLDBs e HEP", Instrumentação + Computação, 2001 LIP Workshop, Portugal, Tomar.

19-21/12/1999 "A base de dados da experiência Hera-B", A. Amorim, V. Amaral, et. al, LIP 99 meeting, Ericeira, Portugal

21/12/1999 "Como dar Persistencia e Acesso ao Controlo da DAQ ATLAS: DAQ/Event Filter Prototype-1 Project" - A.Amorim, C.A. Ribeiro, Vasco Amaral, LIP 99 meeting, Ericeira, Portugal

### **Post-Graduations ( as supervisor )**

2007 "(H)ALL: a DSL for Rapid Prototyping of User Interfaces for Control Systems for Critical Complex Control Systems" (MSc) - Bruno Fontes Barroca - (28 Feb 2006 to 27 Jun 2007)

2004 "Engines de mapeamentos", Jose Orlando Letra, Carlos Ruão, Graduation project, University of Tras-os-Montes e Alto Douro (UTAD), Portugal

2003 "Automating the Calibration and Alignment revision process in Hera- B", (Msc), Galina, University of Sofia, St. Kl. Ohridski, Bulgaria, 19 of June 2003

2002 "Physics analysis using Database Technology", Luis Silva, DESY International Summer student program, post-graduation project.

### **Post-Graduations ( as jury )**

*(H)ALL: a DSL for Rapid Prototyping of User Interfaces for Control Systems for Critical Complex Control Systems*, (MSc) - Bruno Fontes Barroca - [ 27 Jun 2007 ]

*The UML Modeling Tool of ProjectIT-Studio*, (MSc) - João Paulo Pedro Mendes da Sousa Saraiva (INESC Id) - [ 28 Feb 2007 at IST UTL, Lisbon]

### **Organization of Events**

Steering Committe member @ 6th PPPJ (in coop. ACM) Principles and Practices of Programming in Java [2008]

Program Committe Member @ [\*\*2nd Bioinformatics Research and Development - BIRD 2008\*\*](#)

Organizing Committe Chair @ 5th PPPJ (in coop. ACM) Principles and Practices of Programming in Java [5 Sep 2007 to 7 Sep 2007 ]

Program Committe Member @ DEXA 2007, 18th International Conference on Database and Expert Systems Applications [3 Sep 2007 to 7 Sep 2007 ]

Organizing Committe Co-Chair @ 2006 RUIPIACS Rapid User Interface Prototyping Infrastructures Applied to Control Systems [13 Sep 2006 to 13 Sep 2006 ]

Session Chair, 6th PPPJ (in coop. ACM) Principles and Practices of Programming in Java [2008]

## Organization of Educational Events

Co-organizer SWERC 2007, ACM-ICPC regional contest , South Western Europe Regional ACM Programming Contest 2007. November, 17-19, 2007. Lisbon, Portugal.

Organization member, ExpoFCT(exposition of the CS department for portuguese National High School teachers and students), April, 13, 2007

Organization member, ForumFCT, Almada Forum, 18-23 May 2007

Co-organizer SWERC 2006, ACM-ICPC regional contest , South Western Europe Regional ACM Programming Contest 2006. November, 17-19, 2006. Lisbon, Portugal.

## Teaching at UNL

**Domain Specific Languages:** Spring semester of 2007/2008 (under preparation).

**Software Development Methods:** Spring semester of 2007/2008.

**Formal languages and automata theory:** Spring semester of 2004/2005, Spring semester of 2005/2006, Spring semester of 2006/2007.

**Algorithms and data structures:** Spring semester of 2005/2006.

**Algorithms and data structures(advanced course):** Winter semester of 2005/2006.

**Introduction to Programming:** Winter Semester of 2006/2007.