

HUGO SERENO FERREIRA, PHD

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Professor, researcher and entrepreneur with 12+ years of professional experience and 20+ published works (*h-index* 5), focused in high-quality, adaptable, large-scale and mission-critical software solutions. His career encompasses projects for government, military and privately held businesses. Today he specialises in research, education and consultancy in Object-Oriented/Functional Programming, Architecture & Design Patterns, and Agile Methodologies. First student to be jointly awarded a Ph.D. (with distinction) in Computer Science by the Universities of Porto (UP), Minho (UM) and Aveiro (UA), he held a *postdoc* research position at INESC TEC.

After receiving a Licentiate degree in *Informatics and Computation Engineering*, Hugo performed military R&D for NATO at *ParadigmaXis*, S.A. There he progressively assumed the roles of developer, team leader, software architect, and project manager in several government and privately held projects. His university teaching career started shortly after becoming a doctorate candidate in meta-programming and model-driven software engineering (2007), mainly at the Faculty of Engineering of the University of Porto (FEUP).

In 2011 Hugo co-founded *Shiftforward, Lda.* with Paulo Cunha, a strategy and technology consultancy company that specialises in high-scalable software infrastructures for the Online Advertising industry. Still in its infancy, *Shiftforward* already gathered several European clients and works with companies all over the world (including *Xplosion Interactive*, *Semasio*, *Wellington Partners*, *Eyeota*, ...), helping them to evaluate, acquire, design or develop the highest-quality technology to fulfil their online media business plans.

Professional Experience

CURRENTLY HELD POSITIONS & AFFILIATIONS

- ★ 2011 — Co-Founder & Chief Technology Officer (CTO), Shiftforward, Lda. { <http://shiftforward.eu> }
- ★ 2008 — Visiting Professor, FEUP Faculty of Engineering, University of Porto { <http://www.fe.up.pt> }
- ★ 2011 — Collaborating Professor, FLUP Faculty of Arts, University of Porto { <http://www.letras.up.pt> }
- ★ 2009 — Collaborating Researcher, INESC Instituto de Engenharia de Sistemas e Computadores do Porto

PAST EXPERIENCE IN ACADEMY

- 2011-2012 Postdoctoral Researcher, INESC Instituto de Engenharia de Sistemas e Computadores do Porto
- 2011 Guest Lecturer, ISEP Instituto Superior de Engenharia do Porto
- 2008 Lecturer, ISTECS Instituto Superior de Tecnologias Avançadas

PAST EXPERIENCE IN INDUSTRY

- 2011 Senior Architect, ParadigmaXis - Arquitectura e Engenharia de Software, S.A.
- 2010-2011 Independent Consultant working with Critical Software PT, Semasio DE, SAGE PT, Tectonic UK, etc.
- 2007-2010 Researcher, ParadigmaXis - Arquitectura e Engenharia de Software, S.A.
- 2003-2007 Software Engineer, ParadigmaXis - Arquitectura e Engenharia de Software, S.A.
- 2001-2003 Freelancer in developing software solutions for medical healthcare and sports centers

Education

- 2007-2011 PH.D. in Computer Science (w/ distinction), MAPI Joint Doctoral Programme, FEUP & FCUP UM UA
- 2006 LICENG in Informatics and Computation Engineering, FEUP

Grants, certifications, honors & awards

- 2012 Best paper award for Tiago Boldt Sousa, Hugo Sereno Ferreira, "Object-Functional Patterns: Re-Thinking Development in a Post-Functional World", SEDES @ QUATIC 2012

- 2011-2012 Postdoctoral research grant by INESC, cf. BPD/110054/CAALYX-MV_USIG
- 2007-2011 Scholarship grant for doctoral studies by FCT, cf. SFRH/BDE/33298/2008
- 2009 Best paper award for Hugo Sereno Ferreira, Ademar Aguiar, João Pascoal Faria, “*Adaptive Object Modelling: Patterns, Tools and Applications*”, SEDES @ ICSEA 2009
- 2004-2011 NATO-secret security clearance for military R&D

2008 — Publications & talks

JOURNAL ARTICLES (PEER-REVIEWED)

- 2010 Hugo Sereno Ferreira, Ademar Aguiar, João Pascoal Faria, “*Adaptive Object-Models: A Research Roadmap*”, International Journal On Advances in Software, Vol 3.

CONFERENCE ARTICLES (PEER-REVIEWED)

- ★ 2012 Tiago Boldt Sousa, Hugo Sereno Ferreira, “*Object-Functional Patterns: Re-Thinking Development in a Post-Functional World*”, Proceedings of SEDES’2012 at the 8th International Conference on the Quality of Information and Communications Technology. Lisbon, Portugal. *Best Paper Award*.
- 2012 Sandra Prescher, Alan Bourke, Friedrich Koehler, Angelo Manuel Martins, Hugo Sereno Ferreira, Tiago Boldt Sousa, Rui Castro, António Santos, Marc Torrent Poch, Sergi Gomis Gascó, Hospedales Margarita, John Nelson, “*A Ubiquitous Ambient Assisted Living Solution to Promote Safer Independent Living in Older Adults Suffering from Co-morbidity*”, Proceedings of the 34th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC’12). California, USA.
- 2012 Hugo Sereno Ferreira, Tiago Sousa, Angelo Martins, “*Scalable Integration of Multiple Health Sensor Data for Observing Medical Patterns*”, Proceedings of the 9th International Conference on Cooperative Design, Visualization and Engineering. Osaka, Japan. Lecture Notes in Computer Science 7467.
- 2012 Tiago Almeida, Hugo Sereno Ferreira, Tiago Sousa, “*A collaborative expandable framework for end-users and programmers*”, Proceedings of the 9th International Conference on Cooperative Design, Visualization and Engineering. Osaka, Japan. Lecture Notes in Computer Science 7467.
- 2011 Patricia Matsumoto, Eduardo Guerra, Hugo Sereno Ferreira, Filipe Correia, Joseph Yoder, Ademar Aguiar, “*AOM Roles Metadata Mapping*”, Proceedings of the 18th Conference on Pattern Languages of Programs, Portland, Oregon, USA.
- 2011 Hugo Sereno Ferreira, Filipe Figueiredo Correia, Ademar Aguiar, Joseph Yoder, “*The Lazy Semantics Pattern on the context of Meta-Architectures*”, 2nd Asian Conference on Pattern Languages of Programs, Tokyo, Japan.
- 2010 Hugo Sereno Ferreira, Filipe Correia, Joseph Yoder, Ademar Aguiar, “*Core Patterns of Object-Oriented Meta-Architectures*”, Proceedings of the 17th Conference on Pattern Languages of Programs, Reno, Nevada, USA.
- 2010 Marco Cunha, Ana Paiva, Hugo Sereno Ferreira, Rui Abreu, “*PETTool: A Pattern-Based GUI Testing Tool*”, 2nd International Conference on Software Technology and Engineering, Puerto Rico, USA.
- 2009 Gabriela Soares, Rosaldo Rossetti, Nuno Flores, Ademar Aguiar, Hugo Sereno Ferreira, “*A Cooperative Personal Agenda in a Collaborative Team Environment*”, Proceedings of the 6th International Conference on Cooperative Design, Visualization and Engineering. Lecture Notes in Computer Science 5738.
- 2009 António Rito Silva, David Martinho, Ademar Aguiar, Nuno Flores, Filipe Correia, Hugo Sereno Ferreira, “*An Implementation Model for Agile Business Process Tools*”, International Workshop on Organizational Design and Engineering, Portugal.
- 2009 Hugo Sereno Ferreira, Filipe Correia, Ademar Aguiar, “*Design for an Adaptive Object-Model Framework: An Overview*”, Proceedings of the 4th International Workshop on Models@runtime, Denver, Colorado, USA.
- 2009 Filipe Correia, Hugo Sereno Ferreira, Nuno Flores, Ademar Aguiar, “*Patterns for Consistent Software*

Documentation”, Proceedings of the 16th Conference on Pattern Languages of Programs, Chicago, Illinois, USA.

- ★ 2009 Hugo Sereno Ferreira, Ademar Aguiar, João Pascoal Faria, “*Adaptive Object Modelling: Patterns, Tools and Applications*”, 3rd Symposium on Doctoral Students of Software Engineering. Proceedings of the 4th International Conference on Software Engineering Advances, Porto, Portugal. *Best Paper Award*.
- 2009 Filipe Correia, Hugo Sereno Ferreira, Nuno Flores, Ademar Aguiar, “*Incremental Knowledge Acquisition in Software Development Using a Weakly-Typed Wiki*”, Proceedings of the 5th International Symposium on Wikis and Open Collaboration, Orlando, Florida, USA.
- 2008 Hugo Sereno Ferreira, Filipe Correia, Leon Welicki, “*Patterns for Data and Metadata Evolution in Adaptive Object Models*”, Proceedings of 15th Conference on Pattern Languages of Programs, Nashville, Tennessee, USA.
- 2008 Filipe Correia and Hugo Sereno Ferreira, “*Trends on Adaptive Object-Model Research*”, Proceedings of the 3rd Edition of the Doctoral Symposium in Informatics Engineering, Porto, Portugal.

TECHNICAL WHITEPAPERS

- 2012 Paulo Cunha, André Silva, João Azevedo, Hugo Sereno Ferreira, “*AdStress: The Online Advertising Stress Testing Platform*” { <http://goo.gl/XL20R> }.
- 2012 Paulo Cunha, João Azevedo, André Silva, Hugo Sereno Ferreira, “*AdForecaster: Predict Your Campaign Ad Impressions in Seconds*” { <http://goo.gl/dPwr0> }.

OTHERS

- 2012 Filipe Figueiredo Correia, Nuno Flores, Hugo Sereno Ferreira, Ademar Aguiar, “*Assessing Tools for Software Development: An overview of three user evaluations*”, User evaluation for Software Engineering Researchers (USER) Workshop at the 34th International Conference on Software Engineering.
- 2012 Hugo Sereno Ferreira, “*Introdução à Programação Objecto-Funcional com Scala*”, MundoJ 53.
- 2011 Michel Wermelinger, Hugo Sereno Ferreira, “*Quality evolution track at QUATIC’10*”, ACM SIGSOFT Software Engineering Notes, p. 28.

DISSERTATIONS

- 2010 Adaptive Object-Modeling: Patterns, Tools and Applications. *PhD dissertation*
- 2004 Framework for Development of Command & Control Systems. *LicEng dissertation*

TALKS

- 2013 Shiftforward – *Lessons Learned in Entrepreneurship*, Beta-Talk Porto, Facts Coworking
- 2012 Episode “*What’s a Programming Language?*” in *Engenharia num Minuto* { paginas.fe.up.pt/~engmin }
- 2011 *Incomplete by Design*, Inside Awareness, Faculty of Engineering, University of Porto
- 2009 *Causal Connections*, Models@Runtime Workshop, Denver, Colorado, USA
- 2009 *Pattern Languages*, Seminários Ortogonais, Faculty of Sciences, University of Porto
- 2008 *The Path to Abstraction*, Instituto Superior de Tecnologias Avançadas

2008 — Teaching

MASTER IN INFORMATICS AND COMPUTING ENGINEERING · FEUP · 5 YEARS

- 2012-2013 Software Engineering · 3rd yr, TP
- 2011-2013 Agile Software Development Methodologies · 5th yr, TP
- 2011-2012 Information Systems and Software Engineering Seminars · 5th yr, T
- 2010-2011 Object-Oriented Programming Laboratory · 2nd yr, TP
- 2010-2011 Project Management Laboratory · 4th yr, P

2009-2010	Operating Systems · 3rd yr, TP
2008-2011	Formal Methods in Software Engineering · 4th yr, TP
2008-2009	Software Engineering · 3rd yr, TP
2008-2009	Software Engineering Laboratory · 4th yr, TP
MASTER IN ELECTRICAL AND COMPUTERS ENGINEERING · FEUP · 5 YEARS	
★ 2011-2013	Programming II · 1st yr, T&TP
2008-2011	Formal Methods in Software Engineering · 4th yr, TP
POST-GRADUATION IN ENTERPRISE APPLICATION ENGINEERING · ISEP · 1 YEAR	
2010-2011	Agile Methodologies in Software Engineering · 1st yr, T&TP
LICENCIATE IN INFORMATION SCIENCE · FEUP & FLUP · 3 YEARS	
2011-2013	Information Systems Analysis II · 3rd yr, TP
LICENCIATE IN INFORMATICS ENGINEERING · ISTECS · 3 YEARS	
2007-2008	Database Management Systems · 2nd yr, T&TP
2009 —	Supervising
PHD IN INFORMATICS ENGINEERING CO-SUPERVISING (PRODEI, FEUP)	
★ 2011 —	Tiago Boldt Sousa, <i>Object-Functional Patterns: Rethinking Development in a Postfunctional World</i> .
MASTER DEGREE IN INFORMATICS ENGINEERING SUPERVISING (FEUP)	
★ 2012 —	João Alves, — at INESC TEC.
★ 2012 —	Luis Simões, <i>Pattern Language for Managing Open Source Projects</i> .
★ 2012 —	João Figueiredo, <i>Modularization of Large Web Applications</i> at Blip.
★ 2012 —	Carlos Tiago Babo, <i>Generic and parameterizable service for remote configuration of mobile phones using Near Field Communication</i> at Fraunhofer AICOS.
★ 2012 —	Bruno Ferreira, <i>Smartphone Based Fall Prevention Exercises</i> at Fraunhofer AICOS.
2012-2013	Vasco Grilo, <i>Towards a Live Development Environment</i> .
2011-2012	Tiago Almeida, <i>End-User Programming In Mobile Devices through Reusable Visual Components Composition</i> .
2011-2012	Jorge Mateus, <i>Agile Business Intelligence Using Microsoft® SharePoint</i> at Critical Manufacturing.
2011-2012	Inês Carvalho, <i>Espresso Medical Systems</i> at Scionis - Medical Information Systems.
2010-2011	André Carmo, <i>Introducing End-User Reconfiguration on Clinical Knowledge Information Systems</i> at Critical Software, S.A.
2010-2011	Marcelo Cerqueira, <i>Ambiente de Modelação e Configuração de Processos</i> at Siemens S.A.
MASTER DEGREE IN INFORMATICS ENGINEERING CO-SUPERVISING (FEUP)	
2009-2010	João Gradim Pereira, <i>Improving Variability of Applications using Adaptive Object-Models</i> at Tecla Col- orida, Lda.
BACHELOR DEGREE IN INFORMATICS ENGINEERING CO-SUPERVISING (ISEP)	
2012	Diogo Ferreira da Silva, <i>Desenvolvimento de Aplicação Android para Monitorização de Idosos</i> at INESC.
2012	Vítor Hugo Moreira, <i>Desenvolvimento de Aplicação Android para Monitorização de Idosos</i> at INESC.

SCIENTIFIC INITIATION SUPERVISING

2012-2013 Luís Fonseca, *Object-Functional Pattern Variants of Adaptive Object-Models* at INESC TEC.

Scientific services

MASTER DEGREE COMMITTEES (EXCLUDING SUPERVISING JURIS)

2011 *Chair.* Tiago Carvalho, *A Meta-Language and Framework for Aspect-Oriented Programming*, MSc in Informatics Engineering, FEUP

2011 *Chair.* João Antunes, *Desenvolvimento e integração de editores gráficos de elevado impacto visual*, MSc in Informatics Engineering, FEUP

GRANT COMMITTEES

2012 Research grant, *Ambient Assisted Living for All*. 18mo @ INESC TEC

2012 Scientific Initiation grant, *Object-Functional Pattern Variants of AOMs*. 3mo @ INESC TEC

PROGRAM COMMITTEES & REVIEWS

2013 *Reviewer.* 18th European Conference on Pattern Languages of Programs (EUROPLOP 2013)

2013 *Book Reviewer.* Alvin Alexander, “*Scala Cookbook*”, O’Reilly Media, Inc., 2013

2013 *PC Member.* Wavefront Experience at the 4th annual SPLASH conference

2012 *Reviewer.* IEEE Transactions on Software Engineering (TSM)

2012 *PC Member.* 8th Int. Conf. on the Quality of Information and Communications Tech. (QUATIC 2012)

2012 *Reviewer.* 19th Conference on Pattern Languages of Programs (PLOP 2012)

2012 *PC Member.* Doctoral Symposium in Informatics Engineering (DSIE 2012)

2011 *PC Member.* 2nd International Summer School on Domain Specific Modeling

2011 *PC Member.* 18th Conference on Pattern Languages of Programs (PLOP 2011)

2011 *PC Member.* Model Driven Engineering (ECM/MDE, INFORUM 2011)

2011 *PC Member.* MiniPLOP Brasil IME/USP

2011 *Reviewer.* 16th European Conference on Pattern Languages of Programs (EUROPLOP 2011)

2011 *Reviewer.* IEEE Software

2010 *PC Member.* 6th Int. Conf. on the Quality of Information and Communications Tech. (QUATIC 2010)

2010 *Reviewer.* 17th Conference on Pattern Languages of Programs (PLOP 2010)

2010 *Reviewer.* 15th European Conference on Pattern Languages of Programs (EUROPLOP 2010)

CONFERENCE ORGANIZATION

2012 *Co-Chair.* 3rd Agile Portugal

2011 *Co-Chair.* 2nd Agile Portugal

2010 *Co-Chair.* 1st Agile Portugal

2010 *Co-Organizing Chair.* Quality Evolution in ICT Track of the 7th International Conference on the Quality of Information and Communications Technology (QUATIC 2010)

2008 *Student Volunteer.* 23rd Annual ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2008)

2008 *Student Volunteer.* 15th Conference on Pattern Languages of Programs (PLOP 2008)

AFFILIATIONS

★ 2009 — *Member.* The International Hillside Group is an educational non-profit organization, that sponsors and helps running various conferences (PlopConference, EuroPlop, ChiliPlop, KoalaPlop, Mensore

PLoP, SugarloafPLoP, and UP97) and has been responsible for getting the *Pattern Languages Of Program Design* series of books put together and published

★ 2008 — Member. Software Engineering Group at Faculty of Engineering, University of Porto

OTHER SCIENTIFIC & MANAGEMENT ACTIVITIES

- ★ 2011 — *Head of Laboratory*. Masters in Informatics and Computation Engineering Student's Lab FEUP.
- 2012 Co-author and commission member for the A3ES accreditation of the MIEIC course at FEUP.
- 2011-2012 Co-author and commission member for the EUR-ACE accreditation of the MIEIC course at FEUP.

Main Projects

RESEARCH PROJECTS

- 2011-2014 AAL4ALL: AMBIENT ASSISTED LIVING FOR ALL, INESC PORTO, €8.18m *cf.* QREN 13852
Senior Researcher. A mobilizing project for an industrial ecosystem of products and services in the scope of Ambient Assisted Living (AAL), focused on the definition of specific standards.
- 2011-2013 CAALYX-MV: COMPLETE AAL MARKET VALIDATION, INESC PORTO, €3.91m *cf.* ICT-PSP-2009-3-250577
Senior Researcher. An european project to widely validate an innovative and efficient ICT-based solution focused on improving the quality of life of the elderly through wearable light devices.
- 2011-2012 ECAALYX: ENHANCED AAL, INESC PORTO, €2.7m *cf.* AAL-010000-2009-13
Senior Researcher. Three-year project funded by the European Commission under the AAL Joint Programme (Strategic Objectives addressed: ICT-based Solutions for Prevention and Management of Chronic Conditions of Elderly People). The project builds on the strengths of the infrastructure and functionality already developed in the original CAALYX project (2007/2008).

MILITARY RESEARCH & DEVELOPMENT

- 2004-2005 MRS: MIP REFERENCE SYSTEM, NC3A
Architecture, design and implementation of the MIP reference system for LC2IDEM data replication, used by the NATO R&D Agency, and to which the alliance implementations have to comply.
- 2003-2004 MIPX: FRAMEWORK FOR DEVELOPMENT OF COMMAND AND CONTROL SYSTEMS, NC3A
Architecture, design and implementation of an infrastructure to develop LC2IDEM-based Command and Control Systems.

INDUSTRIAL PROJECTS

- ★ 2012 — AD-STRESS, SHIFTFORWARD { <http://www.adstress.com> }
Chief Technology Officer (CTO). A platform that efficiently simulates complete browser interactions with advertising platforms at a very large scale (over 100m unique users) with multiple interactions with the system. It can also simulate server-to-server connections for testing RTB Clients and Servers at very high requests per second (over 50k). Technologies: Scala, Akka, JVM, Amazon EC2.
- ★ 2012 — AD-FORECASTER, SHIFTFORWARD { <http://www.adforecaster.com> }
Chief Technology Officer (CTO). A next-generation forecasting engine for online ad campaigns that overcomes key limitations of existing forecast engines, by allowing accurate prediction of future ad impressions traffic levels and campaign inventory availability using unlimited number of targeting variables, including geo, keywords, key-values, cookies, and multiple frequency capping groups at banner, booking, line item or campaign level. Technologies: Scala, Akka, JVM, Amazon EC2.
- 2012 RE-ENGINEERING OF MEDICAL SOFTWARE, IM3DICAL
Project Leader and Senior Consultant for IM3DICAL re-engineering of its medical software for Mac OSX and iOS platforms. Technologies: Objective-C, XML.
- 2012 HL7 INTEGRATION, IM3DICAL

- Project Leader and Senior Consultant for IM3DICAL integration with HL7, developed at INESC Porto. Technologies: Microsoft® BizTalk, XML, HL7, MLLP.
- 2011-2011 COOLBIZ: TRADING SYSTEM, BANCO CARREGOSA
Software Quality Engineer for a back-end and front-end financial trading system for Banco Carregosa, developed at ParadigmaXis. Technologies: C++, Apache QPID, AMQP, QT, XML.
- 2009-2010 SMQVU: URBAN LIFE QUALITY, CMP
Analysis and development of an Information System for Câmara Municipal do Porto – Gabinete de Estudos e Projectos. Supports the assessment of urban life quality attributes of the city of Porto, by providing a centralized tool to collect, analyze and synthesize statistical data over hundreds of indexes. Technologies: C#, WPF, Oracle database 11g, SQLite, QT, XML.
- 2007-2010 OGHMA, PARADIGMAXIS
One of the results from my Ph.D. work, it is the current main infrastructure of several production-level Information Systems developed at ParadigmaXis, including Locvs, Zephyr and GISA. Technologies: C#, SQLite, XML.
- 2007-2010 LOCVS: ARCHITECTURAL AND ARCHAEOLOGICAL HERITAGE, CMP
Analysis and development of an Information System for Câmara Municipal do Porto, Departamento Municipal do Património e Cultura. It supports the full workflow of collection, process, analysis and storage of textual, graphical and geospatial heritage information of the city of Porto. Technologies: C#, WPF, Oracle database 11g, SQLite, ARCGIS, XML.
- 2006-2007 GEOXIS: GEO-SPATIAL BACK-END FRAMEWORK AND INFRASTRUCTURE, PARADIGMAXIS
Design and implementation of an infrastructure for displaying and analysing geospatial data. Used by several partners including (but not limited to): Vodafone, Portugal Telecom, Optimus, Clix and ITP. Technologies: Python, C++, C#, HTML5, Javascript, PostgreSQL, PostGIS, XML.
- 2005-2006 MAPADVENTURE, PARADIGMAXIS { <http://www.mapadventure.com.pt> }
Design and implementation of an application and infrastructure for displaying and using military cartography in mobile devices, intended for sports and leisure activities in the wild. The system was developed in cooperation with Infoportugal and IGeOE. Technologies: C++, C#.