MAP-I: Doctoral Program in Informatics
2011-12 Edition

Proposal of a Curriculum Unit in Computation Paradigms

Research Topics in Software Engineering

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Abstract: This document describes a Ph.D. level course, corresponding to a curriculum unit credited with 5 ECTS. It corresponds to a joint UMinho-UAveiro-UPorto proposal for UCPC (Paradigms of Computation) in the joint MAP-I doctoral program in Informatics. It is presented the programmatic component, the lecturing team, and the plans for the coordination with curriculum units in other PhD programs.

A. Programmatic Component

1. Theme, Justification and Context

Motivation: Software Engineering

Software engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software, and the study of these approaches; that is, the application of engineering to software. It applies both computer science and engineering principles and practices to the creation, operation, and maintenance of software systems. Knowledge of programming is the main prerequisite to becoming a software engineer, but it is not sufficient. In fact, according to the IEEE's Guide to the Software Engineering Body of Knowledge (SWEBOK), software engineering, as a scientific field, encompasses many subdisciplines:

1. Software requirements: The elicitation, analysis, specification, validation and management of requirements for software.
2. Software design: The process of defining the architecture, components, interfaces, and other characteristics of a system or component.

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[1] Coordinator

3. Software construction: The construction of software through the use of programming languages and tools.
4. Software testing: The empirical investigations conducted to discover defects and improve the confidence on the quality of software systems.
5. Software maintenance: Software systems often have problems and need enhancements for a long time after they are first delivered. This subfield deals with the problems and approaches for software maintenance.
6. Software configuration management: The discipline of identifying the configuration of software at distinct points in time for the purpose of systematically controlling changes to the configuration and of maintaining the integrity and traceability of the configuration throughout the system life cycle.
7. Software engineering management: The management and measurement of software engineering activities borrows heavily from project management, but there are nuances encountered in software not seen in other management disciplines.
8. Software engineering process: Concerned with the definition, implementation, assessment, measurement, management, change, and improvement of the software engineering process itself.
9. Software engineering tools and methods: The scientific application of a set of tools and methods to the development of software which is meant to result in high-quality, defect-free, and maintainable software products.
10. Software quality: The approaches used to measure how well software is designed (quality of design), and how well the software conforms to that design (quality of conformance).

Software engineering is also related to the disciplines of computer science, project management, and systems engineering. This diversity of skills and competences makes it mandatory to have a broad approach when teaching software engineering. This course addresses some of the challenges faced by software engineers and the software engineering field that are posed by the increasing complexity and criticality of software intensive systems on which our society is ever more dependent. More specifically, in this course, we plan to tackle several subdisciplines of software engineering and address the research challenges that nowadays emerge in those subdisciplines. Additionally, we plan to present in this course the state-of-the-art of several subdisciplines of software engineering and to identify challenges that might help doctoral students on selecting a topic for developing research in Software Engineering.

Course Context

ACM Computing Classification System subjects covered:

- D. Software / D.2 Software Engineering / D.2.1 Requirements/Specifications
- D. Software / D.2 Software Engineering / D.2.2 Design Tools and Techniques
- D. Software / D.2 Software Engineering / D.2.11 Software Architectures
- D. Software Engineering / Reusable Software / D.2.13 Domain engineering
- D. Software Engineering / Reusable Software / D.2.13 Reuse models
- K. Computing Milieux / K.6 Software Management / K.6.3 Software development

2. Objectives and Learning Outcomes

This course aims to cover, both from the foundational and the methodological point of view, the analysis, design, construction, verification and validation of large-software systems. As a second

objective the course aims at providing the conceptual tools for the use of models in all phases of the software process.

The course is not intended as an introductory survey on Software Engineering, but as an opportunity of exposing students to cutting-edge research topics in this area, although presented in a coherent and integrated way. It is placed at a similar level and covers overlapping material with advanced modules in doctoral programs at leading academic institutions.

Upon successful completion of this curricular unit, students should be able:

- to promote the assessment of the software process and to monitor, in collaboration with software engineers, the software process improvement efforts;
- to identify the positive and negative aspects of the software process, through the acquisition, analysis, and interpretation of quantitative data;
- to define what type of procedures the requirements engineering team is supposed to execute at the development process, by identifying the formal involvement of the stakeholders;
- to define the way requirements are to be elicited and the techniques to use to correctly gather requirements from all the sources;
- to idealize different alternative architectures to solve the same problem and evaluate (justifying) which is the best one in terms of design quality;
- to recognize and understand several architectural and design patterns;
- to explain the need for describing software systems with models, as a way to abstract from the system's complexity and to reason about its properties;
- to use models for the activities associated with the development of large software systems, from analysis and design through construction, testing and maintenance;
- to understand the concepts, challenges and applicability of advanced software testing, analyses and quality measurement techniques.

3. Course Contents

1. SOFTWARE PROCESS ENGINEERING

This unit takes software processes as the main focus of study. The software engineering process can be considered at two distinct levels:

(1) the activities related to acquisition, development, and maintenance of software;
(2) the activities related to the definition, implementation, measurement, and improvement of the software process itself.

In this context, this unit focuses on the techniques and methods devoted to:

(1) the definition of software processes at its relation to the software artifacts' lifecycles;
(2) the configuration and enactment of best practices and reference processes to support the development of large-scale software solutions.

The unit is structured into the following topics:

- Software process fundamentals (software lifecycles and notations for process definition).

- Overview of some representative software processes (such as RUP, Scrum, and PSP/TSP).
- Software processes for large enterprises (EUP, EABOK, TOGAF).
- Software process improvement and maturity models (ISO standards, SEI reference models).
- Supporting frameworks: software lifecycle management frameworks; software knowledge management frameworks; software process engineering frameworks.

2. REQUIREMENTS ENGINEERING AND MANAGEMENT

This unit focuses on the software requirements knowledge area as a critical domain of software engineering, as outlined in the IEEE Computer Society's Software Engineering Body of Knowledge (SWEBOK). The area of software requirements deals with the elicitation, analysis, specification, validation, and management of software requirements. Requirements are the properties that a given system (still in project) will exhibit when its development is finished. This area is recognized as being extremely important for industry, since its activities have a great impact on the development process.

This unit focuses on the following topics:

- Overview of requirements engineering concepts and processes.
- Elicitation techniques.
- Goal, use-case and scenario based requirements engineering.
- Models in requirements engineering.
- Requirements engineering for software product lines.
- Collaborative and social platforms for requirements engineering.

3. SOFTWARE DESIGN AND PATTERNS

The architecture of a software system describes the global structure in terms of its components, external properties and its interrelations. As software systems grow in scale and complexity, it becomes increasingly more important to understand them at many abstraction levels other than algorithms, functions, objects or components, and by different kinds of people, such as procurers, acquirers, producers, integrators, trainers, and users. Architectural models for such large-scale systems must be tailored to allow the dynamic construction and allocation of customized applications to heterogeneous computing devices, with different computational or interface capabilities.

In this unit, design and architectural challenges for highly complex and large-scale software systems are addressed. Many of these are software engineering challenges that must take into consideration aspects not only related with individual computing devices, but also with the entire system obtained from the cooperation of diverse, dispersed, integrated or mobile computing devices that in conjunction contribute to the achievement of the overall system objectives.

In particular, the following topics will be considered:

- Software design: fundamental concepts and principles.
- Software architecture: definitions, concepts, components, connectors, views, quality attributes, reference models and reference architectures.
- Architectural styles: pipes and filters, data abstraction, object-orientation, event-based systems, layered systems, repositories, interpreters, process-control systems.
- Software patterns: origins, notion of patterns and pattern languages, kinds of patterns (architectural, design, others).

- Thematic catalogs of patterns: patterns of enterprise application architecture, patterns for enterprise integration.

4. MODEL-DRIVEN SOFTWARE CONSTRUCTION

Raising the level of abstraction is fundamental to cope with the increasing complexity of software systems. This unit's purpose is to study modeling frameworks in Software Engineering that enable the usage of models (i.e., abstract high-level representations of to-be systems) not only for specification and documentation, but also for software construction. A particular focus will be placed on the Unified Model Language (UML). As the OMG specification states, UML is "a graphical language for visualizing, specifying, constructing, and documenting the artifacts of a software intensive system". Although in itself it does not specify any methodological or design process, its role as a (collection of inter-related) semi-formal notations in supporting software development, from business processes or global architectures down to database schema, and reusable software components, became more and more fundamental, almost a de facto standard, to the whole Software Engineering discipline.

Particular emphasis will be placed on the following topics:

- Making UML models precise and executable, either through the use of UML related languages (OCL and UML action semantics), or through the integration with formal specification languages (like VDM++, Petri nets or Alloy).
- Definition of domain specific languages and UML profiles, using the UML extensibility mechanisms and the UML meta-model.
- Model transformation (from analysis into design models, making explicit the envisaged software architecture, and from platform independent into platform specific models).
- Code generation from design models, especially for behavior-intensive systems, and its current limitations.
- Models at run-time: adaptive object models.

5. SOFTWARE TESTING AND ANALYSES

Our society is increasingly dependent on the correct functioning of software systems, so the software industry should strive to deliver essentially defect free software, by using more effective and efficient defect detection and prevention techniques than are in common use today. The goal of this unit is to cover some of the most promising techniques in that direction.

This unit will cover the following topics:

- Automatic test generation: model-based testing and pattern-based testing.
- Automatic fault localization and debugging.
- Automatic error detection (e.g., automatic generation of test oracles and assertions).
- Model verification and validation techniques.
- Software static analysis.
- Static and dynamic (test-based) defect prediction techniques.
- Measuring software quality: code and model quality metrics and tools.

4. Teaching Methods and Student Assessment

The best way to understand and master software engineering is to experience it. In the educational setting, this means:

- learning the fundamental concepts and principles;
- knowing and understanding the solutions and practices proven to be the best, through the exploration of specific examples from the past, so-called case studies;
- applying the knowledge acquired by imitating and adapting known solutions to a specific problem through hands-on development of a software system, in an individual project.

No textbook adequately covers the course's range of topics, so a diversity of bibliographic elements (books, journals and conference proceedings) will be used.

Classes

The class meetings are meant to be conversational, and we encourage students to ask questions and make comments. Consequently, the discussion may follow tangents to the prepared lecture, but they should be fruitful, informative, and thought provoking. These classes are conducted by all the elements of the lecturing team.

Panels and talks

Two panels or talks will be organized to complement the topics covered by the formal classes. These panels or talks will involve both the lecturing team and possibly faculty members that are not formally associated with this UC.

Readings

Each week, the students must read papers or some few supplemental materials provided, related to the topics discussed in class. All reading assignments come from journals and conference proceedings. This exposes many students to extensive readings from the research literature for the first time. To help them with their reading, we require them to write a brief summary for each paper, and submit it electronically before the next class. We also ask them to submit a list of questions about the readings, which we try to work into the lecture if possible. During the last few weeks of the course, we no longer require reading summaries, to give students more time to focus on the project.

Individual research project

Whilst the goal of the readings is to develop a critical but shallow view over a broad range of topics addressed in classes, the goal of the individual research project is to develop a more in depth understanding on a specific software engineering research topic, matching as much as possible each student interests, as well as the lecturers areas of expertise. Projects are designed to combine a state of the art analyses with an experimental assessment. Grading of individual research projects if based on an oral presentation (for a more methodological project) or demonstration (for a more technological project), and a final written report. No two students can work on the same project. A few weeks into the course, descriptions of possible projects are handed out to students, who are also encouraged to

propose projects of their own. Once students complete their project, they must demonstrate it, make an oral presentation, and submit a final written report.

5. Basic Bibliographic References

- Ambler SW, Nalbone J, Vizdos MJ. *The Enterprise Unified Process: Extending the Rational Unified Process*, Addison-Wesley, 2008.
- Buschmann F, Meunier R, Rohnert H, Sommerlad P, Stal P. *Pattern-Oriented Software Architecture, Volume 1: A System of Patterns*, JohnWiley & Sons, 1996.
- Gamma E, Helm R, Johnson R, Vlissides J. *Design Patterns - Elements of Reusable Object-Oriented Software*, Addison-Wesley, 1995.
- Gomaa H. *Designing Software Product Lines with UML: From Use Cases to Pattern-Based Software Architectures*, Addison-Wesley, 2005.
- Kleppe A,Warmer J, BastW. *MDA Explained: The Model Driven Architecture – Practice and Promise*, Addison-Wesley, 2003.
- Mellor SJ, Balcer MJ. *Executable UML: A Foundation for Model-Driven Architecture*, Addison-Wesley, 2002.
- Robertson S, Robertson J. *Mastering the Requirements Process*, Addison Wesley, 2nd edition, 2006.
- Shaw M, Garlan D. *Software Architecture: Perspectives on an Emerging Discipline*, Prentice Hall, 1996.
- Utting M, Legeard M. *Practical Model-Based Testing: A Tools Approach*, Morgan Kaufmann, 2007.

B. Lecturing Team

1. Team Presentation

This course is supported by a team involving researchers from the University of Minho (Ricardo J. Machado, João M. Fernandes), the University of Aveiro (José Maria Fernandes), and the University of Porto (João Pascoal Faria, Ademar Aguiar).

This course is the result of merging two former MAPi units: MDSE (Model-Driven Software Engineering) and ADLSSS (Architecture and Design of Large-Scale Software Systems). MDSE and ADLSSS have successfully been accredited as CMU courses, within the Carnegie Mellon — Portugal Program. Similarly, the current team is available to submit the RTSE course to the same accreditation process.

All team members are working, and have worked actively in the past few years, on topics that are directly related to the subjects covered by this course, as detailed below.

2. Coordinator

The coordinator of the unit is João Pascoal Faria.

3. Short Presentation of Team Members

In the sequel we introduce a brief presentation of each team member, which includes, for each of them, up to 5 key publications related to the scientific area in which this course is proposed. All CVs are supplied in separate PDF documents.

Ricardo J. Machado is associate professor at the Department of Information Systems, UMinho. He is the coordinator of the UMinho scientific activities within the CMU-Portugal Program. His research focuses on software engineering & management, namely on model-driven development, requirements engineering, and software quality. He has lead several research projects resulting in more than 60 publications. His current research projects focus on the development of multi-staged approaches in software product lines and on the integration of multi-standard models in software high maturity levels. He leads the SEMAG research group at the Algoritmi Research Center. He has been involved in the organization of various international events, including ACSD 2003, DIPES 2006, QUATIC 2007, IEEEXtreme 2008 and the MOMPES workshops series.

Key Publications:

- Ferreira A, Machado RJ, Paulk M; *Size and Complexity Attributes for Multi-model Improvement Framework Taxonomy*. 36th EUROMICRO Conference on Software Engineering and Advanced Applications (SEAA 2010), Lille, France, IEEE Computer Society Press, Sep/2010.
- Monteiro P, Machado RJ, Kazman R, Henriques C; *Dependency Analysis between CMMI Process Areas*. 11th International Conference on Product Focused Software Development and Process Improvement (PROFES 2010), Limerick, Ireland, Springer, Jun/2010.
- Bragança A, Machado RJ; *A Model Driven Approach for the Derivation of Architectural Requirements of Software Product Lines*, Innovations in Systems and Software Engineering 5(1):65–78, Springer, Mar/2009.
- Bragança A, Machado RJ; *Transformation Patterns for Multi-staged Model Driven Software Development*. 12th International Software Product Line Conference (SPLC 2008), Limerick, Ireland, IEEE Computer Society Press pp. 329–338, Sep/2008.
- Machado RJ, Lassen KB, Oliveira S, Couto M, Pinto P; *Requirements Validation: Execution of UML Models with CPN Tools*. International Journal on Software Tools for Technology Transfer 9(3–4):353–370, Springer, Jun/2007.

João M. Fernandes is associate professor at the Department of Informatics, UMinho, and a researcher member of CCTC. His scientific research activities are centered around the areas of requirements engineering for software systems, with a particular focus in embedded systems. His interests lie on the usage of the UML and high-level Petri nets, as specification notations for highly complex software systems, and in studying and applying model-driven development approaches. In the embedded software area, his attention focus on issues related to the methodological approach to follow, namely the requirements techniques, the software process model, and the models to be used during development. He is a co-founder and regular editor for the International Workshop Series on Model-based Methodologies for Pervasive and Embedded Software (MOMPES). He is a funding member of the IFIP Working Group 10.2 (Embedded Systems). He is Program Co-chair of the 3rd International Summer School on Generative and Transformational Techniques in Software Engineering (GTTSE 2009), to be held in Jul/2009. In 2002/03, he was a postdoctoral researcher at TUCS (Turku, Finland), and in 2006/7 he was an invited assistant professor at University of Aarhus (Denmark).

Key Publications:

- Gomes L, Fernandes JM (eds.); *Behavioral Modeling for Embedded Systems and Technologies: Applications for Design and Implementation*, IGI Global, ISBN 1-60566-750-1, Jul/2009.
- Jørgensen JB, Tjell S, Fernandes JM; *Formal Requirements Modeling with Executable Use Cases and Coloured Petri Nets*, Innovations in Systems and Software Engineering 5(1):13–25, Springer, Mar/2009.
- Fernandes JM, Machado RJ, Seidman S; *A Requirements Engineering and Management Training Course for Software Development Professionals*, 22th IEEE-CS Conference on Software Engineering Education & Training (CSEE&T 2009), Hyderabad, Índia, IEEE Computer Society Press, pp. 20–5, Fev/2009.
- Fernandes JM, Jørgensen JB, Tjell S; *Requirements Engineering for Reactive Systems: Coloured Petri Nets for an Elevator Controller*, 14th Asia-Pacific Software Engineering Conference (APSEC 2007), Nagoya, Japan, IEEE Computer Society Press, pp. 294–301, Dec/2007.
- Machado RJ, Ramos I, Fernandes JM; *Specification of Requirements Models, Engineering and Managing Software Requirements*, Aurum A.,Wohlin C. (eds.), chap. 3, pp. 47–68, Springer, Jul/2005.

José Maria Amaral Fernandes is assistant professor at the Dep. of Electronics, Telecommunications and Informatics of the Universidade de Aveiro (UA) and is visiting professor at the Carnegie Mellon University (CMU). Since 1997, he is part of IEETA, an R&D institute of the University of Aveiro (http://www.ieeta.pt/sias) where he has been part of more than 10 projects mainly in neuroscience (e.g. EpilBI, MovEpil3D, FCT) and computer science with focus on mobile computing (e.g VitalResponder project - http://www.vitalresponder.org from CMU-Portugal program) and eScience (e.g. BING - http://www.brainimaging.pt - and GeresMED, FCT). His lecturing activity has been focused on mobile computing and software development process from conception to deployment (e.g. Test Driven Development in the development of IT systems using enterprise level solutions). Recently, under faculty exchange program in the context of the Carnegie Mellon-Portugal, he offered a course "17623 – Software Engineering in Mobile Computing" that represented a long waited merge of several lines of interest in both research and lecturing: (design) patterns in programming, modelling and software engineering and architecture applied to mobile computing. During the faculty exchange he started a collaboration with Prof. David Garlan (School of Computer Science, Carnegie Mellon University) focused on the problem of validation and automation of complex analysis workflows (in the scope of BING network) using architecture styles and type checking as high level tools for verification and orchestration.

Key Publications:

- Cunha JPS, Tafula S, Fernandes JM; *3D video-fMRI: Tri-dimensional video-based movement quantification in a 3T fMRI environment*, accepted in Human Brain Mapping, Barcelona, Spain, 2010.
- Oliveira IC, Alves L, Dias E, Pacheco D, Lima S, Barros J, Monteiro MP, Silva JA, Fernandes JM, Cunha JPS, Sousa Pereira A; *Automated endoscopic capsule analysis using a Grid computing environment*, accepted in IBERGRID 2010, Braga, Portugal, May/2010.
- Oliveira I, Cunha JPS, Pacheco D, Fernandes JM, Pedrosa M, Alves L, Sousa Pereira A; *The Portuguese BING Network: Towards a Brain Imaging Grid Virtual Community*, MICCAI-Grid, London, UK, 2009.

- Fernandes JM, Tafula S, Brandão S, Bastos Leite A, Ramos I, Cunha JPS; *Video-EEG-fMRI: Contribution of in-bore Video for the Analysis of Motor Activation Paradigms*, World Congress on Medical Physics and Biomedical Engineering, Munich, Germany, Springer, pp. 786–9, Sep/2009.
- Pacheco D, Oliveira I, Fernandes JM, Cunha JPS; *MAGI: A medical application Grid interfacing portal for eScience*, 3rd Iberian Grid Infrastructure Conference (IBERGRID 2009), Valencia, Spain, NetBiblo, pp. 31–42, May/2009 (best paper award).

João Pascoal de Faria is assistant professor at the Department of Informatics Engineering of Faculty of Engineering of University of Porto (FEUP), researcher at INESC Porto, and co-founder of Strongstep. He is vice-president of the "Comissão Sectorial para a Qualidade nas Tecnologias de Informação e Comunicações (CS03)" of the "Conselho Nacional para a Qualidade" (CNQ). In the past, he also worked with several software companies (Novabase, Sidereus and Medidata). He has more than 20 years of experience in teaching, research and consultancy in several software engineering areas. He is the main author of a rapid application development tool, based on domain specific languages, with more 20 years of market presence and evolution (1989-2011). Since 2008, he is a Certified Personal Software Process (PSP) Developer, Authorized PSP Instructor, and Team Software Process (TSP) Coach by the Software Engineering Institute of the Carnegie Mellon University. He is currently involved in research projects and supervisions in the areas of model-based testing, model-driven development and software process improvement.

Key Publications:

- Andrade FR, Faria JP, Paiva A; *Test Generation from Bounded Algebraic Specifications using Alloy*, 6th International Conference on Software and Data Technologies (ICSOFT 2011), Seville, Spain, 2011 (accepted)
- Cruz AM, Faria JP; *A Metamodel-based Approach for Automatic User Interface Generation*, ACM/IEEE 13th International Conference on Model Driven Engineering Languages and Systems (MODELS'2010), LNCS, Volume 6394/2010, pp 256-270, 2010 (best paper award)
- Amaral LG, Faria JP; *A Gap Analyses Methodology for the Team Software Process*, 7th International Conference on the Quality of Information and Communications Technology (QUATIC 2010), pp.424-429, IEEE Computer Society Conference Publishing Services, 2010
- Cruz AM, Faria JP; *Automatic Generation of Interactive Prototypes for Domain Model Validation*, 3rd International Conference on Software and Data Technologies (ICSOFT 2008), Porto, Portugal, Jul/2008
- Paiva A, Faria JP, Mendes PM; *Reverse Engineered Formal Models for GUI Testing*, 12th International Workshop on Formal Methods for Industrial Critical Systems (FMICS 2007), Berlin, Germany, Jul/2007.

Ademar Aguiar is assistant professor at the Department of Informatics Engineering of Faculty of Engineering of University of Porto (FEUP) and researcher at INESC Porto, with over 20 years of experience on software development, specialized on software architecture and design (patterns, frameworks, and infrastructures), agile methods, wikis, and open collaboration tools. He holds a PhD from FEUP addressing the topic of documenting object-oriented frameworks using an approach supported on wikis. Current research interests include knowledge management practices and tools for software development teams and organizations (from code to documentations) using wiki-based philosophy and tools. Beyond the field of software engineering, Ademar is also exploring and applying Web 2.0 and social software to other audiences and fields, such as music and education, being presently

the most important a collaborative and social educational platform for digital natives (6-12 years old) and their schools and communities, available in Portugal, since September 2008. Since March 2011, he is vice-president of Hillside Group, a nonprofit organization that promotes the use of patterns and pattern languages to record, analyze, and improve software and its development.

Key Publications:

- Ferreira HS, Correia FF, Aguiar A, Yoder J; *Core Patterns of Object-Oriented Meta-Architectures,* in Proceedings of the 17th Conference on Pattern Languages of Programs (PLoP), pp.1-8, 2010.
- Ferreira HS, Correia F, Aguiar A, Faria JP; *Adaptive Object-Models: a Research Roadmap,* International Journal on Advances in Software, Vol.3 nº 1, 2010
- Restivo A, Aguiar A; *Unexpected Interactions Detection*, 8th International Conference on Aspect-Oriented Software Development (AOSD 2009), Mar/2009
- Kajko-Mattsson M, Aguiar A, Boness K, Kaindl H, Pooley R, Tael A; *Long-Term Perspective of Agile Methods*, in Fourth International Conference on Software Engineering Advances, 2009
- Flores N, Aguiar A; *Patterns for Framework Understanding,* in Proceedings of the 15th Conference on Pattern Languages of Programs (PLoP), 2008

C. Coordination with other PhD programs

The proposed FEUP lecturers for this MAP-I curriculum unit (João Pascoal Faria and Ademar Aguiar), together with Ana Paiva and Rui Maranhão, are also lecturers of the curriculum unit *Tópicos de Investigação em Engenharia de Software* (TIES) of FEUP's Doctoral Program in Informatics Engineering (PRODEI).

Given that these two curriculum units have similar names, goals, calendars and assessments methods, it is proposed that both work as a single unit (with the same schedule) for the 2011-12 edition.

Curriculum Vitae

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Jan.2011

CURRICULUM VITAE

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ACADEMIC DEGREES

PhD on Electrotechnical Engineering and Computers, from Faculty of Engineering , University of Porto (FEUP), titled "*A Minimalist Approach to Framework Documentation*", June 2004.

Master of Science on Electrotechnical Engineering and Computers from FEUP, July 1994.

Degree on Electrotechnical Engineering and Computers from FEUP, July 1989.

ACADEMIC POSITIONS

Assistant Professor, from FEUP, since June 2004.

Assistant Lecturer, from FEUP, from October 1994 to June 2004.

RESEARCH POSITIONS

Researcher at INESC Porto, on Software Engineering areas, since 1989.

MAIN RESEARCH AREAS

Software architecture: application frameworks (object-oriented and aspect-oriented); patterns of software.

Software engineering: agile documentation, wikis for software engineering (documentation and collaboration), software knowledge engineering, aspect-oriented software development.

OTHER SCIENTIFIC AREAS

Software architecture: component-based software development.

Software engineering: agile processes, object-oriented analysis and design, software engineering tools.

Information systems: Model-driven development; Business process modelling.

MAIN RESEARCH AND DEVELOPMENT PROJECTS

PDI – Master Plan for the Information Systems of Porto Municipality, project leader, INESC Porto, March 1992 – March 1994.

PDI Execution Support – Master Plan for the Information Systems of Porto Municipality, project leader, INESC Porto, March 1994 – January 1996.

Archivum – archival description system, researcher, FCT project, INESC Porto, de January 1996 – January 1998.

SIMAT – Municipal information systems, GIS technical applications, researcher, INESC Porto, July 1997 – March 2000.

Metamedia - Meta-information for Multimedia Archives, researcher, INESC Porto, July 1999 – July 2000.

ParadigmaXis –Software Engineering Consulting, consulting, INESC Porto, October 2000 – December 2001.

Metamedia 2 - Meta-information on the Preservation and Retrieval of Multimedia Components, researcher, INESC Porto, October 2000 – March 2003.

GLOBALNest – Global constraints for irregular shapes placement problems, researcher, INESC Porto, March 2004 – September 2006.

e-ASLA - e-Administration Framework for Small Local Administration, INESC Porto, January 2005 – July 2007.

MEDSI - Management Decision Support for Critical Infrastructures, 6th Framework Programme, Contract IST-506991, consulting, January 2004 – October 2005.

DocIt! Cooperative Support for Cost-Effective Development of Quality Framework Documentation, project leader, January 2006 – December 2006.

Caalyx - Complete Ambient Assisted Living Experiment, 6th Framework Programme, Contract IST-2005-045215, consulting, January 2007 – December 2008.

Porto Digital, Projecto POSC, Associação Porto Digital, Universidade do Porto, consulting, July 2005 – December 2007.

Wipro Retail Wiki, Wipro Retail, INESC Porto, January 2009 – March 2009.

DBPreserve - Data Warehouses for the Long-term Preservation of Institutional Electronic Records and Databases, FCT Project (PTDC/CCI/73166/2006), INESC Porto, researcher, October 2007 – September 2009.

RECENT SCIENTIFIC ACTIVITIES

Hillside Group Board member, since October 2007. Board Vice-President, since March 2011.

WikiSym Steering Committee member, since September 2008.

SPLASH'2011 Workshops Chair, ACM Conference on Systems, Programming, Languages, and Applications: Software for Humanity (SPLASH'11), Portland, Oregon, October 2011, http://www.splashcon.org/.

Co-organizer of Agile Portugal 2011, Porto, Portugal, June 2011, http://agilept.org/.

Co-organizer of Agile Portugal 2010, Porto, Portugal, June 2010, http://agilept.org/.

Co-organizer of *Wikis for Software Engineering,* workshop of WikiSym'2009 – 5th International Conference on Wikis and Open Collaboration, Orlando, Florida, October 2009, http://wikis4se.org/.

Co-organizer of *Wikis for Software Engineering*, workshop of ICSE'2009 - 31st International Conference on Software Engineering, Vancouver, Canada, May 2009, http://wikis4se.org/.

Co-organizer of *Practices for Linking Aspects Technology and Evolution*, workshop of AOSD'2009 - 8th International Conference on Aspect-Oriented Software Development, Charlottesville, Virginia, USA, March 2009, http://www.aosd.net/workshops/plate/2009/.

Conference chair for WikiSym'2008 – International Symposium on Wikis, Porto, Portugal.

Program chair for PLoP'2008 – 15th Conference on Pattern Languages of Programs, 2008, Nashville, Tennessee, USA.

Co-organizer of *Wikis for Software Engineering*, workshop of WikiSym'2008, Porto, Portugal, September 2008, http://wikis4se.org/.

Conference chair for PLoP'2007 – 14th Conference on Pattern Languages of Programs, 2007, Illinois, USA.

Co-organizer of *Wikis for Software Engineering*, workshop of WikiSym'2007, co-located with OOPSLA'2007, Montreal, Canada, October 2007, http://wikis4se.org/.

Organizer of *Wiki-based Software Documentation*, workshop of WikiSym'2005, co-located with OOPSLA'2005, San Diego, California, USA, October 2005, http://www.wikisym.org/ws2005/.

Organization co-chair of *WER'2005 - VIII Workshop on Requirements Engineering*, workshop of CAiSE'2005, Porto, Portugal, June 2005, http://gnomo.fe.up.pt/~wer2005/.

Local organizer of *CAiSE'2005 – The 17th Conference on Advanced Information Systems Engineering*, Porto, Portugal, June 2005, http://gnomo.fe.up.pt/~caise/.

Co-organizer of *XATA'2003 – XML: Aplicações e Tecnologias Associadas*, Braga, Portugal, February 2003, http://xata.fe.up.pt/2003/.

Shepherd for several Conferences on Pattern Languages of Programs: EuroPLoP, VikingPLoP, and PLoP, since 2001.

Reviewer of IEEE Software, 2007.

Tutorial Lecturer of "Agile Documentation of Object-Oriented Frameworks", OOPSLA'2005, San Diego, USA, 2005.

RECENT PROGRAM COMMITTEES

Program committee member of *PLoP'2010 – 17th Conference on Pattern Languages of Programs*, co-located with SPLASH'2010, Reno, USA, October 2010, http://hillside.net/plop/2010/.

Program committee member of *WikiSym'2010 – International Symposium on Wikis*, Gdansk, Poland, July 2010, http://www.wikisym.org/ws2010/.

Program committee member of *WikiSym'2009 – International Symposium on Wikis*, co-located with OOPSLA'2009, Orlando, USA, October 2009, http://www.wikisym.org/ws2009/.

Program committee member of *PLoP'2009 – 16th Conference on Pattern Languages of Programs*, co-located with Agile'2009, Chicago, USA, August 2009, http://hillside.net/plop/2009/.

Program committee member of *COMPSAC'2009 - 33rd Annual IEEE International Computer Software and Applications Conference*, Seattle, USA, July 2009, http://conferences.computer.org/compsac/2009/.

Program committee member of *EuroPLoP'2009 – 13th European Conference on Pattern Languages of Programs*, Irsee, Germany, July 2009, http://hillside.net/europlop/.

Program committee (chair) of *Wikis for Software Engineering*, workshop of ICSE'2009 - 31st International Conference on Software Engineering, Vancouver, Canada, May 2009, http://wikis4se.org/.

Program committee member of *Practices for Linking Aspects Technology and Evolution*, workshop of AOSD'2009 - 8th International Conference on Aspect-Oriented Software Development, Charlottesville, Virginia, USA, March 2009, http://www.aosd.net/workshops/plate/2009/.

Program committee (chair) of *PLoP'2008 – 15th Conference on Pattern Languages of Programs*, co-located with OOPSLA'2008, Nashville, Tennessee, USA, October 2008, http://hillside.net/plop/2008/.

Program committee member of *JISBD'2008 – 13th Conference on Software Engineering and Databases*, Gijón (Spain), October 2008, http://www.sistedes.es/jisbd2008/.

Program committee member of *Wikis for Software Engineering*, workshop of WikiSym'2008, Porto, Portugal, September 2008, http://wikis4se.org/.

Program committee member of *CoRTA'2008 - Compilers, Related Technologies and Applications*, Bragança, Portugal, July 2008, http://www.estig.ipb.pt/corta2008/.

Program committee member and Shepherd of *EuroPLoP'2008 – 12th European Conference on Pattern Languages of Programs*, Irsee, Germany, July 2008, http://hillside.net/europlop/europlop2008/.

Program Committee member of *XATA'2008 – XML: Aplicações e Tecnologias Associadas*, Évora, Portugal, February 2008, http://xata.fe.up.pt/2008/.

Program Committee member of *VEWAeL 2008 - First International Workshop on Virtual Environments and Web Applications for e-learning*, Athens, Greece, June 2008, http://www.iaria.org/conferences2008/VEWAeL.html

Program committee member of *OOPSLA'2007 Panels - ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications*, Montreal, Canada, October 2007, http://www.oopsla.org/oopsla2007/.

Program committee member of *WikiSym'2007 – International Symposium on Wikis*, co-located with OOPSLA'2007, Montreal, Canada, October 2007, http://www.wikisym.org/ws2007/.

Program committee member of *Wikis for Software Engineering*, workshop of WikiSym'2007, co-located with OOPSLA'2007, Montreal, Canada, October 2007, http://wikis4se.org/.

Reviewer for the Program committee of *ACM Hypertext'2007 Hypertext and Society Track*, Manchester, UK, September 2007, http://www.sigweb.org/ht07/.

Program committee member of *SEDES'2007 - Simpósio para Estudantes de Doutoramento em Engenharia de Software*, Lisboa, Portugal, September 2007, http://quatic2007.dsi.uminho.pt/.

Program committee member of *PLoP'2007 – 14th Conference on Pattern Languages of Programs*, Illinois, USA, September 2007, http://hillside.net/plop/2007/.

Program Committee member of *XATA'2007 – XML: Aplicações e Tecnologias Associadas*, Lisboa, Portugal, February 2007, http://xata.fe.up.pt/2007/.

Program committee member of *WikiSym'2006 – International Symposium on Wikis*, co-located with ACM Hypertext'2006, Odense, Denmark, August 2006, http://www.wikisym.org/ws2006/.

Program Committee member of *WER'2006 - IX Workshop on Requirements Engineering*, Rio de Janeiro, Brazil, July 2006, http://www.ime.uerj.br/~vera/WER06/.

Program Committee member of *XATA'2006 – XML: Aplicações e Tecnologias Associadas*, Portalegre, Portugal, February 2006, http://xata.fe.up.pt/2006/.

Program committee member of *WikiSym'2005 – International Symposium on Wikis*, co-located with OOPSLA'2005, San Diego, California, USA, October 2005, http://www.wikisym.org/ws2005/.

Program committee member of *CAiSE'2005 – The 17th Conference on Advanced Information Systems Engineering*, Porto, Portugal, June 2005, http://gnomo.fe.up.pt/~caise/.

Program Committee member of *WER'2005 - VIII Workshop on Requirements Engineering*, workshop of CAiSE'2005, Porto, Portugal, June 2005, http://gnomo.fe.up.pt/~wer2005/.

Program Committee member of *IVNET'2005 – First International Conference of Innovative Views of .NET Technologies*, Porto, Portugal, June 2005, http://w2ks.dei.isep.ipp.pt/labdotnet/ivnet05/.

Program Committee member of *XATA'2005 – XML: Aplicações e Tecnologias Associadas*, Braga, Portugal, February 2005, http://xata.fe.up.pt/2005/.

Reviewer for *The 2nd International Conference on Information Technology (ICIT 2005) - "Human Computer Interaction"*.

Program Committee member of *XATA'2003 – XML: Aplicações e Tecnologias Associadas*, Braga, Portugal, February 2003, http://xata.fe.up.pt/2003/.

RECENT PUBLICATIONS

Rito Silva, António; Martinho, David; Aguiar, Ademar; Flores, Nuno; Correia, Filipe Figueiredo; Ferreira, Hugo Sereno, An Implementation Model for Agile Business Process Tools, IWODE'09 — International Workshop on Organizational Design and Engineering, December 2009, Lisboa, Portugal, http://iwode09.ist.utl.pt/.

Correia, Filipe Figueiredo; Ferreira, Hugo Sereno; Flores, Nuno; Aguiar, Ademar, Incremental Knowledge Acquisition in Software Development Using a Weakly-Typed Wiki, WikiSym'09 — International Symposium on Wikis and Open Collaboration. October 2009, Orlando, Florida, USA, http://wikisym.org/ws2009/.

Correia, Filipe Figueiredo; Ferreira, Hugo Sereno; Aguiar, Ademar, Design for an Adaptive Object-Model Framework: An Overview, 4th International Workshop MODELS@runtime 2009, October 2009, Denver, Colorado, USA. http://www.hillside.net/plop/2009/.

Correia, Filipe Figueiredo; Ferreira, Hugo Sereno; Flores, Nuno; Aguiar, Ademar, Patterns for Consistent Software Documentation, PLoP'09 — Conference on Pattern Languages of Programs, October 2009, Chicago, Illinois, USA, http://www.hillside.net/plop/2009/.

Ferreira, Hugo Sereno; Aguiar, Ademar; Faria, João Pascoal, Adaptive Object-Modelling: patterns, tools, and applications, SEDES'09 — Simpósio para Estudantes de Doutoramento em Engenharia de Software, September 2009, Porto, Portugal, http://www.iaria.org/conferences2009/SEDES.html.

Restivo, André; Aguiar, Ademar, Testing for Unexpected Interactions in AOP, SEDES'09 — Simpósio para Estudantes de Doutoramento em Engenharia de Software, September 2009, Porto, Portugal, http://www.iaria.org/conferences2009/SEDES.html.

Flores, Nuno; Aguiar, Ademar, Patterns and Tools for improving Framework Understanding: a Collaborative Approach, SEDES'09 — Simpósio para Estudantes de Doutoramento em Engenharia de Software, September 2009, Porto, Portugal, http://www.iaria.org/conferences2009/SEDES.html.

Mira Kajko-Mattsson, Ademar Aguiar, Kenneth Boness, Hermann Kaindl, Rob Pooley, Andreas Tael, Long-Term Perspective of Agile Methods, Fourth International Conference on Software Engineering Advances, 2009, http://www.iaria.org/conferences2009/.

Antonio Rito Silva, Rachid Meziani, Rodrigo Magalhaes, David Martinho, Ademar Aguiar, Nuno Flores, AGILIPO: Embedding Social Software Features into Business Process Tools, The Second Workshop on Business Process Management and Social Software, 2009.

Soares, Gabriela; Rossetti, Rosaldo; Flores, Nuno; Aguiar, Ademar; Ferreira, Hugo Sereno. Towards a Cooperative Personal Agenda in a Collaborative Team Environment. 6th International Conference on Cooperative Design, Visualization and Engineering. Luxembourg. September 2009.

Ferreia, Hugo Sereno; Correia, Filipe Figueiredo; Aguiar, Ademar. Design for an Adaptive Object-Model Framework: An Overview. 4th International Workshop of Models@run.time (co-located with 12th International Conference On Model Driven Engineering Languages And Systems). Denver, Colorado, USA. October 2009.

Ademar Aguiar, Paulo Merson, Uri Dekel, "Proceedings of the Wikis for Software Engineering Workshop", ICSE'2009 Companion, IEEE/ACM, Vancouver, Canada, May 2009 (to appear).

Ademar Aguiar, Paulo Merson, Uri Dekel, "Wikis for Software Engineering Workshop", ICSE'2009 Companion, IEEE/ACM, Vancouver, Canada, May 2009 (to appear).

André Restivo, Ademar Aguiar, "drUID – Unexpected Interactions Detection", AOSD'2009, ACM, Charlottesville, Virginia, March 2009 (to appear).

Ademar Aguiar, Mark Bernstein, "Proceedings of the 2008 International Symposium on Wikis – WikiSym'2008", Porto, Portugal, ACM (to appear).

Ademar Aguiar, Joe Yoder, "Proceedings of the 2008 Conference on Pattern Languages of Programs", ACM, Nashville, Tennessee, USA, October 2008 (to appear).

Nuno Flores, Ademar Aguiar, "Patterns for Understanding Frameworks". PLoP'2008, ACM, Nashville, Tennessee, USA, October 2008 (to appear).

André Restivo, Ademar Aguiar, "Disciplined Composition of Aspects using Tests". 4th International Linking Aspect Technology and Evolution workshop (LATE'08), Brussels, Belgium, April 2008.

Nuno Flores, Ademar Aguiar, "Patterns for Understanding Frameworks". PLoP'2008, Nashville, Tennessee, USA, October 2008.

André Restivo, Ademar Aguiar, "Disciplined Composition of Aspects using Tests". 4th International Linking Aspect Technology and Evolution workshop (LATE'08), Brussels, Belgium, April 2008.

Ademar Aguiar, Gabriel David, "Patterns for Documenting Frameworks - Process". SugarLoafPLoP'2007, Recife, Brazil, May 2007.

André Restivo, Ademar Aguiar, "Towards Detecting and Solving Aspect Conflicts and Interferences Using Unit Tests". Software Engineering Properties of Languages and Aspect Technologies (SPLAT'07), Vancouver, B.C., Canada, March 2007.

Paulo Santos, Ademar Aguiar, "Drag-and-Dock Design Pattern", PLoP'2006, Portland, USA, October de 2006.

Ademar Aguiar, Gabriel David, "Patterns for Documenting Frameworks: part III", PLoP'2006, Portland, USA, October 2006.

Nuno Flores, Ademar Aguiar, "Design Pattern Recovery to Improve Framework Understanding". In 1st International Workshop on Design Patterns Detection for Reverse Engineering (DPD4RE 2006), WCRE'06, Benevento, Italy, October 2006.

Ademar Aguiar, Gabriel David, "Patterns for Documenting Frameworks: part II", EuroPLoP'2005, Irsee, Alemanha, July 2006.

Clara Silveira, João Pascoal Faria, Ademar Aguiar, Raul Vidal, "Wiki Based Requirements Documentation of Generic Software Products". AWRE'05 - The Tenth Australian Workshop on Requirements Engineering, 22 November 2005, Melbourne, Australia, pp. 42-51 (best paper award)

Ademar Aguiar, Gabriel David, "WikiWiki Weaving Heterogeneous Software Artifacts", In proceedings of WikiSym 2005 - 2005 International Symposium on Wikis, Oct 17-18, 2005, San Diego, California, U.S.A., co-located with ACM OOPSLA 2005.

Ademar Aguiar, Gabriel David, "Patterns for Documenting Frameworks: part I", VikingPLoP'2005, Helsinki, Finland, September 2005.

Nuno Flores, Ademar Aguiar, "JFREEDOM: a Reverse Engineering Tool to Recover Framework Design", in Serge Demeyer, Kim Mens, Roel Wuyts, Stéphane Ducasse, Proceedings of the 6th ECOOP Workshop on Object-Oriented Reengineering (WOOR'05), Glasgow, July 2005, Springer-Verlag,.

Nuno Flores, Ademar Aguiar, "Reverse Engineering of Framework Design using a Meta-Patterns-based Approach", AICCSA'2005 – Workshop on Software Stability: Timeless Architectures and System of Patterns, Cairo, Egipt, January 2005.

Susanne Jucknath, Jan Wloka, Eric Jul, Sari R. Eldadah, Ademar Aguiar: "The Combined 14th Workshop for PhD Students in Object-Oriented Systems and Doctoral Symposium", in "Object-Oriented Technology: ECOOP 2004 Workshop Reader", ECOOP 2004 Workshops, Oslo, Norway, June 14-18, 2004, Final Reports. Lecture Notes in Computer Science 3344 Springer 2005, ISBN 3 540 23988 X.

Ademar Aguiar, Gabriel David, Greg Badros, "JavaML 2.0: enriching the markup language for Java source code", XATA'2004 – XML, Aplicações e Tecnologias Associadas, Porto, Portugal, February 2004.

Ademar Aguiar, Gabriel David, Manuel Padilha, "XSDoc: An Extensible Wiki-based Infrastructure for Framework Documentation", VIII Jornadas de Ingeniería del Software y Bases de Datos, Alicante, Spain, November 2003.

Ademar Aguiar, Gabriel David, "A Minimalist Approach to Framework Documentation", in 13th Workshop for PhD Students in Object-Oriented Systems, Workshop Reader of the 15th European Conference on Object-Oriented Programming, Darmstadt, Germany, July 2003.

Ademar Aguiar, Gabriel David, "FrameDocMS – um sistema de gestão de conteúdos para documentação de frameworks baseado em XML e WikiWikiWeb", XATA'2003 – XML, Aplicações e Tecnologias Associadas, Braga, Portugal, February 2003.

Ademar Aguiar, A. Sousa, A. Pinto, "Use-Case Controller", in Proceedings of the Sixth European Conference on Pattern Languages of Programming and Computing, Irsee, Germany, 2001.

Ademar Aguiar. "A Minimalist Approach to Framework Documentation", in OOPSLA 2000 Companion proceedings of the 15th Annual ACM Conference on Object-Oriented Programming Systems, Languages and Applications, Minneapolis, Minnesota, United States of America, October 2000.

Gabriel David, Maria Cristina Ribeiro, José Torres, Ademar Aguiar, "Metadata for the Preservation and Retrieval of Multimedia Components", in ECAI - Electronic Cultural Atlas Initiative, 2000.

Ademar Aguiar, "Pseudo-Reference Pattern", in Proceedings of the Fourth European Conference on Pattern Languages of Programming and Computing (EuroPLoP 1999), pages 1–12, Universittsverlag Konstanz.

RECENT ACADEMIC COURSES

Research Topics in Software Engineering, ProDEI – Doctoral Programme on Informatics Engineering, FEUP (since 2005).

Architecture of Software Systems, MEI and MIEIC Masters on Informatics Engineering, FEUP (since 2004).

Agile Methods, MEI and MIEIC Masters on Informatics Engineering, FEUP (since 2005).

Software Engineering Laboratory, MIEIC Master on Informatics Engineering, FEUP (since 2001).

Software Engineering, MIEEC Master on Electrical and Computer Engineering, FEUP (since 2004).

Software Project Management Laboratory, MIEIC Master on Informatics Engineering, FEUP (since 2003).

ADVANCED TRAINING COURSES

Organization, coordination, and lecturing of several advanced training courses (~40), since 1994, for software companies, on topics related to Software Development (Eiffel, C++, OODBs, Java,) and Software Engineering (OOAD, OOP, OMT/UML, Eclipse, Agile Methods, Refactoring, Patterns, SOA).

LANGUAGES

English: very good. French: reasonable.

CURRICULUM VITÆ
João M. Fernandes
2010, 08 May

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> Universidade do Minho
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Academic degrees, Institutions, Fields of study:
• PhD, U.Minho, Informatics / Computer Engineering, May/2000.
• MSc, U.Minho, Informatics / Computing Science, Jul/1994.
• Licenciatura (5-year degree), U.Minho, Systems and Informatics Engineering, Sep/1991.

Current position, Institution: Associate Professor, U.Minho, since Oct/2007.

Previous positions, Institutions:
▪ Visiting Assistant Professor, Aarhus Universitet, Dep. Computer Science, Denmark, Sep/2006-Jun/2007.
▪ Invited Assistant Professor, Universidade do Algarve, Faculty of Sciences and Technology, Faro, Portugal, Sep/2004-Jun/2006.
▪ Post-doctoral Researcher, TUCS, Turku, Finland, Sep/2002-Feb/2003.
▪ Vice-president of the Engineering Degrees Council, U.Minho, Oct/2004-Sep/2006.
▪ Director of the 5-year degree in Systems and Informatics Engineering, U.Minho, Jun/2004-Sep/2006.
▪ Assistant Professor, U.Minho, May/2000–Oct/2007.
▪ Assistant, U.Minho, Jul/1994–May/2000.
▪ Teaching Assistant, U.Minho, Nov/1991–Jul/1994.
▪ Junior Assistant, U.Minho, 1989/90.

Main research area: Software Engineering

Other scientific interests: Embedded Computing, Systems Modelling

Organisation of international scientific conferences:
1. Organising Committee Chair, 31st International Conference on Application and Theory of Petri Nets and Other Models of Concurrency (PETRI NETS 2010), Braga, Portugal, Jun/2010. Proceedings to be published by Springer.
2. Organising Committee Chair, 10th International Conference on Application of Concurrency to System Design (ACSD 2010), Braga, Portugal, Jun/2010. Proceedings to be published by IEEE Computer Society Press.
3. Program Committee Co-chair, 3rd International Summer School on Generative and Transformational Techniques in Software Engineering (GTTSE 2009), Braga, Portugal, Jul/2009.
4. Editor and organiser, Workshop series on Model-based Methodologies for Pervasive and Embedded Software (MOMPES); 6 editions, 2004-2009. Proceedings published by IEEE Computer Society Press, since 2006.
5. Industry Liaison Committee Chair, IEEE Second International Symposium on Industrial Embedded Systems (SIES 2007), Costa da Caparica (Lisbon), Portugal, Jul/2007
6. Organising Committee Co-chair, 5th IFIP International Conference on Distributed and Parallel Embedded Systems (DIPES 2006), Braga, Portugal, Oct/2006. Proceedings published in IFIP series, Springer.
7. Organising Committee Co-chair and Finance chair, 3rd IEEE International Conference on Application of Concurrency to System Design (ACSD 2003), Guimarães, Portugal, Jun/2003. Proceedings published by IEEE Computer Society Press.
8. Program Committee Member of several international conferences and workshops: BM-MDA, CENICS, CONTROLO, CPN, DIPES, DSOA, ENC, ETFA, ICESS, ICSEA, INForum, MOMPES, PETRI NETS,

QUORS, QUATIC, REC, SIES, SPAC, TeaConc, UCAmI, WMUPS.
9. Reviewer for international journals published by IEEE (Computer, Software, Transactions on Computers, Transactions on Software Engineering, Transactions on Knowledge and Data Engineering, Transactions on Industrial Electronics), ACM (Transactions on Embedded Computing Systems), Elsevier (Computers in Industry, Energy, Information Sciences, Integration - the VLSI Journal, Science of Computer Programming), Springer (Software and Systems Modeling, Transactions on Petri Nets and Other Models of Concurrency), and Taylor & Francis (European Journal of Engineering Education).

Most relevant publications (2005-9):
1. Fernandes JM, Sousa SM; PlayScrum - A Card Game to Learn the Scrum Agile Method, 2nd International Conference on Games and Virtual Worlds for Serious Applications (VS-GAMES 2010), Braga, Portugal, IEEE Computer Society Press, pp. 52–9, Mar/2010. doi 10.1109/VS-GAMES.2010.24.
2. Larsen PG, Fernandes JM, Habel J, Lehrskov H, Vos RJC, Wallington O, Zidek J; A Multidisciplinary Engineering Summer School in an Industrial Setting, European Journal on Engineering Education 34(6):511–26, Taylor & Francis, ISSN 0304-3797, Dec/2009. doi: 10.1080/03043790903150687.
3. Ribeiro OR, Fernandes JM; Validation of Scenario-based Business Requirements with Coloured Petri Nets, 4th International Conference on Software Engineering Advances (ICSEA 2009), Porto, Portugal, IEEE Computer Society Press, pp. 250–5, ISBN 978-0-7695-3777-1, Sep/2009. doi 10.1109/ICSEA.2009.45.
4. Gomes L, Fernandes JM (eds.); Behavioral Modeling for Embedded Systems and Technologies: Applications for Design and Implementation, IGI Global, ISBN 978-1-60566-750-8, Jul/2009. This 494-page book is divided in 15 chapters written by well-known professors and experts from industry.
5. Jørgensen JB, Tjell S, Fernandes~JM; Formal Requirements Modeling with Executable Use Cases and Coloured Petri Nets, Innovations in Systems and Software Engineering 5(1):13-25, Springer, Mar/2009. doi 10.1007/s11334-009-0075-6.
6. Fernandes JM, Machado RJ, Seidman S; A Requirements Engineering and Management Training Course for Software Development Professionals, 22th IEEE-CS Conference on Software Engineering Education & Training (CSEE&T 2009), Hyderabad, Índia, IEEE Computer Society Press, pp. 20-5, Feb/2009. doi 10.1109/CSEET.2009.24.
7. Tjell S, Fernandes JM; Expressing Environment Assumptions and Real-time Requirements for a Distributed Embedded System with Shared Variables, Distributed Embedded Systems: Design, Middleware and Resources, Kleinjohann B, Kleinjohann L, Wolf W (eds.), Springer, IFIP 271, pp. 79-88, Sep/2008. doi 10.1007/978-0-387-09661-2_8.
8. Monteiro MP, Fernandes JM; An Illustrative Example of Refactoring Object-oriented Source Code with Aspect-oriented Mechanisms, Software: Practice and Experience 38(4):361–96, Wiley, Apr/2008. doi 10.1002/spe.835.
9. Fernandes JM, Jørgensen JB, Tjell S; Requirements Engineering for Reactive Systems: Coloured Petri Nets for an Elevator Controller, 14th Asia-Pacific Software Engineering Conference (APSEC 2007), Nagoya, Japan, IEEE Computer Society Press, pp. 294--301, Dez/2007. doi: 10.1109/APSEC.2007.81.
10. Fernandes JM, Machado RJ, Teaching Embedded Systems Engineering in a Software-Oriented Computing Degree, 37th Annual ASEE/IEEE Frontiers in Education Conference (FIE 2007), Milwaukee, WI, USA, Oct/2007. doi 10.1109/FIE.2007.4417949.
11. Mashkoor A, Fernandes JM, Deriving Software Architectures for CRUD Applications: The FPL Tower Interface Case Study, 2nd International Conference on Software Engineering Advances (ICSEA 2007), Cap Esterel, France, IEEE Computer Society Press, Aug/2007. doi 10.1109/ICSEA.2007.25.
12. Ribeiro OR, Fernandes JM, Translating Synchronous Petri Nets into PROMELA for Verification of Behavioural Properties, 2nd IEEE International Symposium on Industrial Embedded Systems (SIES 2007), Costa da Caparica, Portugal, IEEE, Jul/2007. doi 10.1109/SIES.2007.4297344.
13. Fernandes JM, Tjell S, Jørgensen JB, Ribeiro OR, Designing Tool Support for Translating Use Cases and UML 2.0 Sequence Diagrams into a Coloured Petri Net, 6th International Workshop on Scenarios and State Machines (SCESM 2007), within the 29th International Conference on Software Engineering (ICSE 2007), Minneapolis, MN, USA, IEEE Computer Society Press, May/2007. doi: 10.1109/SCESM.2007.1.
14. Fernandes JM, Machado RJ, A Two-Year Software Engineering M.Sc. Degree designed under the Bologna Declaration Principles, 1st International Conference on Software Engineering Advances (ICSEA 2006), Tahiti, French Polynesia, IEEE Computer Society Press, Oct-Nov/2006. doi: 10.1109/ICSEA.2006.13.
15. Fernandes JM, Machado RJ, Monteiro PA, Rodrigues H, A Demonstration Case on the Transformation of Software Architectures for Mobile Applications, From Model-Driven Design to Resource Management for Distributed Embedded Systems, Kleinjohann B, Kleinjohann L, Machado RJ, Pereira C, Thiagarajan PS (eds.), Springer, IFIP 225, pp. 235–44, Oct/2006, ISBN 0-387-39361-7.
16. Fernandes JM, Lilius J., Truscan D., Integration of DFDs into a UML-based Model-Driven Engineering

Approach, Software and Systems Modeling (SoSyM) 5(4):403–28, Springer, Dec/2006. doi: 10.1007/s10270-006-0013-0.

17. Duarte FJ, Fernandes JM, Machado RJ, Business Modeling in Process-Oriented Organizations for RUP-based Software Development, Reference Modeling for Business Systems Analysis, Fettke P, Loos P (eds.), Idea Group, Hershey, Pennsylvania, USA, chap. 5, pp. 98–117, Oct/2006.

18. Machado RJ, Fernandes JM, Monteiro PA, Rodrigues H, Refinement of Software Architectures by Recursive Model Transformations, 7th International Conference on Product Focused Software Process Improvement (PROFES 2006), Münch J, Vierimaa M (eds.), Amsterdam, The Netherlands, Springer, LNCS 4034, pp. 422–8, Jun/2006. doi: 10.1007/11767718_38.

19. Monteiro MP, Fernandes JM, Towards a Catalogue of Refactorings and Code Smells for AspectJ, Transactions on Aspect-Oriented Software Development I, Springer, Rashid A, Aksit M (eds.), LNCS 3880, pp. 214–58, Mar/2006. doi: 10.1007/11687061 7.

20. Monteiro MP, Fernandes JM, Refactoring a Java Code Base to AspectJ: An Illustrative Example, 21st IEEE International Conference on Software Maintenance (ICSM 2005), Budapest, Hungary, IEEE Computer Society Press, pp. 17–26, Sep/2005. doi: 10.1109/ICSM.2005.75.

21. Machado RJ, Fernandes JM, Integration of Embedded Software with Corporate Information Systems, From Specification to Embedded Systems Application, Rettberg A, Zanella MC, Rammig FJ (eds.), pp. 169–78, Springer, Aug/2005. doi: 10.1007/11523277 17.

22. Machado RJ, Ramos I, Fernandes JM, Specification of Requirements Models, Engineering and Managing Software Requirements, Aurum A., Wohlin C. (eds.), chap. 3, pp. 47–68, Springer, Jul/2005. doi: 10.1007/3-540-28244-0_3.

23. Machado RJ, Fernandes JM, Monteiro PA, Rodrigues H, Transformation of UML Models for Service-Oriented Software Architectures, 12th IEEE International Conference on the Engineering of Computer Based Systems (ECBS 2005), Greenbelt, Maryland, USA, pp. 173–82, IEEE Computer Society Press, Apr/2005. doi: 10.1109/ECBS.2005.73.

24. Ribeiro OR, Fernandes JM, Pinto L, Model Checking Embedded Systems with PROMELA, 12th IEEE International Conference on the Engineering of Computer Based Systems (ECBS 2005), Greenbelt, Maryland, USA, IEEE Computer Society Press, pp. 378–85, Apr/2005. doi: 10.1109/ECBS.2005.53.

25. Monteiro MP, Fernandes JM, Towards a Catalog of Aspect-Oriented Refactorings, 4th International Conference on Aspect-Oriented Software Development (AOSD 2005), Tarr P (ed.), Chicago, Illinois, USA, ACM Press, pp. 111–22, Mar/2005. doi: 10.1145/1052898.1052908.

26. Fernandes JM, Duarte FJ, A Reference Framework for Process-Oriented Software Development Organizations, Software and Systems Modeling (SoSyM) 4(1):94–105, Springer, Feb/2005. doi: 10.1007/s10270-004-0063-0.

PhD and MSc supervisions:
1. PhD in Information Systems, Francisco José Monteiro Duarte, Automated Information Systems Generation for Process-Oriented Organizations. Started in Oct/2006.
2. PhD in Informatics, Óscar Rafael da Silva Ferreira Ribeiro. Animation and Validation of Reactive Software from Scenario-Based Models. Finished in Dec/2009.
3. PhD in Informatics, Miguel Jorge Tavares Pessoa Monteiro, Refactorings to Evolve Object-Oriented Systems with Aspect-Oriented Concepts. Finished in Jul/2005.
4. MSc in Informatics, Sónia Marlene Pereira de Sousa, Play Scrum - Um Jogo para a Aprendizagem do Método Ágil Scrum. Finished in Dec/2009.
5. MSc in Informatics, Susana de Jesus Prozil Rodrigues, Algoritmos de decisão multi-critério para atribuição de prioridades a requisitos de software. Finished in Dec/2009.
6. MSc in Informatics, Mauro Jorge Pereira Almeida, Classificação e Comparação de Métodos Ágeis de Desenvolvimento de Software. Finished in Jan/2009.
7. MSc in Informatics, Paula Alexandra Fernandes Monteiro, Model-based Transformations for Pervasive Software Architectures. Finished in May/2006.
8. MSc in Informatics, Óscar Rafael da Silva Ferreira Ribeiro, Model Checking of Petri Nets for Embedded Systems. Finished in Jul/2005.
9. MSc in Informatics, Francisco José Monteiro Duarte. Process-Oriented Software Engineering. Finished in Jul/2002.

Funded projects:
1. UMinho Principal Researcher, AMADEUS: Aspects and Compiler Optimizations for Matlab System Development, Dec/2007-Nov/2009. Programme FCT (PTDC/EIA/70271/2006). Partners: Inesc-Porto (coordination; João M.P. Cardoso), U.Minho, Uninova, Deimos.

2. UMinho Principal Researcher, SOFTAS: Software Development with Aspects, Set/2005-Dez/2007. Programme FCT (POSI/EIA/60189/2004). Partners: FCT-UNL (coordination; Ana M. Moreira), U.Minho, IP Beja, IP Castelo Branco, LINCIS, NAV.
3. Researcher, uPAIN: Ubiquitous Solutions for Pain Monitoring and Control in Post-Surgery Patients, Jan/2005-Fev/2008. Programme AdI/Ideia 2004 (AdI/IDEIA/70/2004/3.1B/00364/007). Partners: U.Minho (coordination; Ricardo J. Machado e Armando Pinto de Almeida), Hospital da Senhora da Oliveira de Guimarães, MobiComp - Computação Móvel.
4. Researcher, STACOS: Standard-Based Cooperative Software, Jan/2004-Abr/2007. Programme FCT Sapiens 2002 (POSI/CHS/48875/2002). Partners: U.Minho (coordination; Ricardo J. Machado), FCUL, INESC-ID, IDITE-Minho, LINCIS, ATX Software.
5. Researcher, PPC-VM: Portable Parallel Computing based on Virtual Machines, Mar/2004-Feb/2007. Programa FCT Sapiens 2002 (POSI/CHS/47158/2002). Partners: U.Minho (coordination; João L. Sobral).
6. Principal Researcher, METHODES: Methodologies and Tools for Developing Embedded Systems, Fev/2002-Jan/2006. Programme FCT Sapiens 2001 (POSI/CHS/37334/2001). Partners: U.Minho, ISEP, IDITE-Minho.

Courses taught in the last years:
In the academic years 2009/10, I was responsible for a optional MAP-i course on "Research Topics in Software Engineering" (9 students). In the academic years 2007/08 and 2008/09, I was responsible for a optional MAP-i course on "Model-Driven Software Engineering" (around 10 students) and a graduate course on "Requirements Engineering and Management" (around 15 students). I was also involved in lecturing a undergraduate course on "Computing System" (around 330 students).
In the academic year 2006/07, I was on a sabbatical leave at the Dep. of Computer Science at University of Aarhus, Denmark, as an invited assistant professor. I had no teaching duties in that period.

CURRICULUM VITAE

João Carlos Pascoal de Faria

1. Personal data

Full name: João Carlos Pascoal de Faria

National identity card: 03703791, Porto, 25-9-2009

Birth place and date: Matosinhos, 19-10-1959

Nationality: Portugal

Institutional address: Faculdade de Engenharia da Universidade do Porto,

Rua Dr. Roberto Frias, s/n, 4200-465 Porto, PORTUGAL.

Home address: R. de Serralves, nº 635, 1º Esquerdo, 4150-708 Porto, Portugal

Fiscal identity number: 169795381, Porto, 6º bairro

Contact data: Telephone: 225081523**,** E-mail: jpf@fe.up.pt , Url:
http://www.fe.up.pt/si/funcionarios_geral.formview?p_codigo=210006

2. Academic degrees and qualifications

Licentiate (5 years): Electrical Engineering - Digital Systems and Computers, Faculty of Engineering of the University of Porto (FEUP), classification 18 (1985).

PhD: Electrical and Computer Engineering, FEUP, approved by unanimity, *Data-driven Active Rules for the Maintenance of Integrity Constraints and Derived Data in Interactive Database Applications* (1999).

He is also a certified PSP[1] Developer, authorized PSP Instructor, and trained TSP[2] Coach by the Software Engineering Institute of the Carnegie Mellon University.

3. Previous and current scientific and/or professional activities

Lecturer at FEUP (December 1985-): He is currently Assistant Professor at the Informatics Engineering Department of the Faculty of Engineering of the University of Porto (FEUP), where he is since December 1985. He teaches courses on software engineering, software testing, requirements engineering, and software project management. He conducts scientific research work and supervision on several software engineering topics, namely model-base testing, model-driven development and software process improvement. He is a member of the scientific council of the Integrated Master Program on Informatics Engineering. He represents FEUP as vice-

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[1] Personal Software Process.

[2] Team Software Process.

president in the "Comissão Sectorial para a Qualidade nas Tecnologias de Informação e Comunicações (CS03)" of the "Conselho Nacional para a Qualidade" (CNQ).

Researcher at INESC Porto (October 1985-): He is a researcher at INESC-Porto since 1985, in the field of Software Engineering and Information Systems, currently at the Information and Information and Computer Graphic Systems (USIG) Unit. From 1989 to 1999 he led the development and maintenance of a rapid application development tool (SAGA), still in use in Portugal and abroad.

Novabase-Saúde (August 2000 - February 2002): In Novabase-Saúde he was responsible for innovation in the Development Unit, where he participated in the CSI (development of a hospital management system) and SIIMS (definition of the future hospital management systems of the Ministry of Health) projects.

Sidereus (March 2002 - November 2002) - He worked with Sidereus as Software Architect in database auditing projects and in the development of Costumer Relationship Management systems.

4. Area of scientific work

Software Engineering.

5. Domain of specialization

Domain of specialization (PhD): Rapid application development tools.

Present research interests: Model-based testing. Model-driven software engineering. Software process improvement.

6. PhD Supervision (last 5 years)

Role	Student	Thesis	Program	Period and status
Co-Supervisor	Hugo José Sereno Lopes Ferreira	Adaptive Object Modelling: Patterns, Tools and Applications	PhD in Informatics (MAP-I)	To be concluded 2011
Supervisor	António Miguel Rosado da Cruz	Automatic Generation of User Interfaces from Rigorous Domain and Use Case Models	PhD in Informatics Engineering (FEUP)	Concluded January 2011

Supervisor	Pedro Miguel Mendes	Automatic Testing of Graphical User Interfaces Based on UML Behavioral Models	PhD in Informatics Engineering (FEUP)	Started January 2007 (suspendend)
Co-supervisor	Ana Cristina Ramada Paiva	Automated Specification-based Testing of User Interfaces	PhD in Electrical and Computer Engineering (FEUP)	Concluded February 2007
Co-supervisor	Maria Clara dos Santos Pinto Silveira	Requirements Reuse in the Development and Adaptation of Generic Software Products	PhD in Electrical and Computer Engineering (FEUP)	Concluded April 2006

He has also supervised dozens of master students in several software engineering and informatics fields.

7. Projects (recent)

Project name	Funding	Institution(s)	Role	Period
QUEST - A Quest for Reliability in Generic Software Components	FCT	FC/UL, FEUP	Member of the research team	Jan 2009-Dec 2012
AAL4ALL – Ambient Assisted Living for All	QREN SI I&DT Projectos Mobilizadores	Fraunhofer Portugal, FEUP, INESC Porto, etc. (32 partners)	Participation in workpackage "Sistema de validação e certificação do ecossistema AAL4ALL"	Mar 2011-Feb 2014
AMBER iTest - An Automated Model-based User Interface Testing Environment	FCT	FEUP, Critical Software	Principal investigator	Jan 2008-Jun 2011
REVVIS - Reunião de Especialistas em Verificação e Validação	CYTED	Several (CYTED network,	Member of FEUP team, V&V of user interfaces with	2007-2010

de Software		Portugal, Spain and Latin America)	model-based testing and usability evaluation	
YES!VV - Demonstration of the Independent Software Verification & Validation Technology	ADI	FEUP, Critical Software, Efacec	Leader of scientific consultancy team from FEUP	2007-2008
IVY - A model-based usability analysis environment	FCT	Minho University, FEUP, INESC Porto	Analysis of alternative modelling notations.	July 2005 - June 2008

8. Publications (recent)

- TEST GENERATION FROM BOUNDED ALGEBRAIC SPECIFICATIONS USING ALLOY
  Francisco Andrade, João Pascoal Faria, Ana Cristina Paiva
  6th International Conference on Software and Data Technologies (ICSOFT 2011), Seville, Spain, 2011 (*accepted*)

- PROPOSAL AND ASSESSMENT OF A CLASSIFICATION OF DEFECT TYPES IN REQUIREMENTS SPECIFICATIONS
  Isabel Lopes Margarido, João Pascoal Faria, Raul Moreira Vidal, Marco Vieira, CISTI'2011 (6ª Conferência Ibérica de Sistemas e Tecnologias de Informação), 15 a 18 de Junho de 2011, em Chaves, Portugal. (*accepted*)

- CMMI PRACTICES: EVALUATING THE QUALITY OF THE IMPLEMENTATION
  Isabel Lopes Margarido, João Pascoal Faria, Marco Vieira, Raul Moreira Vidal, SEPG Europe'2011, 7-9 June, 2011, Dublin, Ireland. (*accepted*)

- PROCEEDINGS OF THE SEVENTH INTERNATIONAL CONFERENCE ON THE QUALITY OF INFORMATION AND COMMUNICATIONS TECHNOLOGY - QUATIC'2010
  Fernando Brito e Abreu (Editor), João Pascoal de Faria (Editor), Ricardo J. Machado (Editor), IEEE Computer Society, 2010

- ADAPTIVE OBJECT-MODELS: A RESEARCH ROADMAP
  Hugo Sereno Ferreira, Filipe Figueiredo Correia, Ademar Aguiar, João Pascoal Faria, International Journal on Advances in Software, Vol.3 nº 1, pp.-, 2010

- A METAMODEL-BASED APPROACH FOR AUTOMATIC USER INTERFACE GENERATION
  António Miguel Rosado da Cruz, João Pascoal Faria , MODELS'2010, Lecture Notes in Computer Science, Volume 6394/2010, pp 256-270, 2010 (*best paper award*)

- AUTOMATIC GENERATION OF USER INTERFACE MODELS AND PROTOTYPES FROM DOMAIN AND USE CASE MODELS
  António M. R. Cruz, João P. Faria, User Interfaces, pp. 35-60, INTECH, 2010 *(book chapter)*

- A GAP ANALYSIS METHODOLOGY FOR THE TEAM SOFTWARE PROCESS
  Luís Amaral, João P. Faria, in 7th International Conference on the Quality of Information and Communications Technology (QUATIC 2010), pp.424-429, IEEE Computer Society Conference Publishing Services, 2010

- TEST COVERAGE ANALYSIS OF UML ACTIVITY DIAGRAMS FOR INTERACTIVE SYSTEMS
  Ricardo Ferreira, João P. Faria, Ana C. R. Paiva, in 7th International Conference on the Quality of Information and Communications Technology (QUATIC 2010), pp.268-273, IEEE Computer Society Conference Publishing Services, 2010

- A ROADMAP TOWARD SOFTWARE QUALITY AT FEUP,
  João P. Faria, Raul M. Vidal, Ana C. Paiva, in SEPG Europe 2010, 28 June - 1 July 2010

- REVERSE ENGINEERING OF GUI MODELS FOR TESTING
  André M. P. Grilo, Ana C. R. Paiva, João Pascoal Faria, CISTI 2010 (5ª Conferência Ibérica de Sistemas e Tecnologias de Informação), 16-19 June 2010, Santiago de Compostela

- TEST COVERAGE ANALYSIS OF UML STATE MACHINES
  Ricardo Ferreira, João P. Faria, Ana C. R. Paiva, in Third International Conference on Software Testing, Verification, and Validation Workshops (ICSTW), pp.284-289, IEEE CONFERENCES, 2010

- AUTOMATIC GENERATION OF USER INTERFACE MODELS AND PROTOTYPES FROM DOMAIN AND USE CASE MODELS
  António M. R. Cruz, João P. Faria, 4rd International Conference on Software and Data Technologies (ICSFOT 2009), August 2009, Sófia, Bulgária

- REVERSE ENGINEERING OF GUI MODELS
  André M. P. Grilo, Ana C. R. Paiva, João Pascoal Faria, Inforum 2009, September 2009, Lisboa

- ADAPTIVE OBJECT-MODELLING: PATTERNS, TOOLS AND APPLICATIONS
  Hugo Sereno Ferreira, Ademar Aguiar, João Pascoal Faria, "SEDES: Simpósio Doutoral de Estudantes de Engenharia de Software" in "ICSEA: Fourth International Conference on Software Engineering Advances", pp. 530-535, June 2009, Porto, Portugal (*best paper award*)

- AUDITING E-VOTING PILOT PROCESSES AND SYSTEMS AT THE ELECTIONS FOR THE EUROPEAN PARLIAMENT AND FOR THE PORTUGUESE PARLIAMENT
  João Falcão, João Pascoal Faria, Mário Jorge Leitão, António Pimenta, Maria Antónia Carravilla, E-Voting: The Last Electroal revolution, Institut de Ciencies Politiques i Socials, PP.93-114, 2008

- AUTOMATIC GENERATION OF INTERACTIVE PROTOTYPES FOR DOMAIN MODEL VALIDATION
António M. R. Cruz, João P. Faria, 3rd International Conference on Software and Data Technologies (ICSFOT 2008), July 2008, Porto, Portugal

- AUTOMATIC GENERATION OF USER INTERFACES FROM DOMAIN AND USE CASE MODELS
António M. R. Cruz, João P. Faria, Proceedings of the Sixth International Conference on the Quality of Information and Communications Technology (QUATIC 2007), September, 2007, Lisbon, Portugal, IEEE Computer Society, pp 208-212

- REVERSE ENGINEERED FORMAL MODELS FOR GUI TESTING
Ana C. R. Paiva, João C. P. Faria, Pedro M. C. Mendes
12th International Workshop on Formal Methods for Industrial Critical Systems (FMICS 2007). July 1-2, 2007, Berlin, Germany

- TOWARDS THE INTEGRATION OF VISUAL AND FORMAL MODELS FOR GUI TESTING
Ana C. R. Paiva, João C. P. Faria, Raul F. A. M. Vidal, MBT'06 - Third Workshop on Model Based Testing, 31 March - 1 April 2007, Braga, Portugal (satellite workshop of ETAPS 2007)

- A METHODOLOGY FOR AUDITING E-VOTING PROCESSES AND SYSTEMS USED AT THE ELECTIONS FOR THE PORTUGUESE PARLIAMENT
J. Falcão e Cunha, M. Jorge Leitão, J. Pascoal Faria, A. Pimenta Monteiro, M. Antónia Carravilla, Electronic Voting 2006 - The 2nd International Workshop on Electronic Voting, 2-4 August 2006, Vienna, Austria

- WIKI BASED REQUIREMENTS DOCUMENTATION OF GENERIC SOFTWARE PRODUCTS
Clara Silveira, João Pascoal Faria, Ademar Aguiar, Raul Vidal, AWRE'05 - The Tenth Australian Workshop on Requirements Engineering, 22 November 2005, Melbourne, Australia (*best paper award*)

- A MODEL-TO-IMPLEMENTATION MAPPING TOOL FOR AUTOMATED MODEL-BASED GUI TESTING
Ana C. R. Paiva, João C. P. Faria, Nikolai Tillmann, Raul F. A. M. Vidal
ICFEM 2005 - Seventh International Conference on Formal Engineering Methods, 1-4 November 2005, Manchester, UK

- MODELING AND TESTING HIERARCHICAL GUIS
Ana C. R. Paiva, João C. P. Faria, Raul F. A. Moreira, Nikolai Tillmann
ASM 2005 - 12th International Workshop on Abstract State Machines, March 8-11, 2005, Paris, France

10. Conferences (recent)

- Member of Program Committee of TSP Symposium 2011, September 19-22, 2011, Atlanta, Georgia

- Organizing Chair of QUATIC 2010 - 7th International Conference on the Quality of Information and Communications Technology, Sep/Oct 2010, FEUP, Porto

- Member of Organizing Committee & Member of Program Committee, SEPG Europe 2010, Jun/Jul 2010, FEUP, Porto

- Member of Steering Committee & Member of Program Committee, SEDES - Simpósio para Estudantes de Doutoramento em Engenharia de Software, 2007, 2009

- Workshops co-chair & Member of Program Committee, QUATIC 2007 - 6th International Conference on the Quality of Information and Communications Technology, Sep 2007, FCT/UL, Caparica

- Member of Program Committee, ICEIS - International Conference on Enterprise Information Systems, 2007, 2008, 2009, 2010, 2011

- Member of Program Committee, CAiSE - International Conference on Advanced Information Systems Engineering – 2005

- Member of Program Committee, INFORUM - Simpósio de Informática 2009, INFORUM 2010, INFORUM 2011 (track chair)

Porto, 5 May 2011

Curriculum Vitae

May 2nd 2011

Name:	José Maria Amaral Fernandes
Birth day & place:	November 16th 1974, St. Louis, Missouri, E. U. A.
Nacionality:	Portuguese (PRT) / American (US)
University address:	IEETA/ DETI – Universidade de Aveiro
	Campus Universitário de Santiago
	3810 - 193 Aveiro
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Phone:	(+351) 234 370 500
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Email:	jfernan@ua.pt
Homepage (www):	http://www.ieeta.pt/~jfernan

Academic degrees:

- PhD in Electrotecnical Engineering, University of Aveiro, Portugal, 2007
- MSc in Computer Science, Faculty of Science, University of Oporto, 1998.
- Graduated in Computer Science, Faculty of Science, University of Oporto, 1996.

Current Positions, institutions

- August 2010 – present: Visiting Faculty, Institute of Software Research / Master of Software Engineering, Carnegie Mellon University
- 2009 - present: member of the scientific committee of Rede Nacional de Imagiologia Funcional Cerebral (RNIFC)
- August 2009 – present: faculty of Carnegie Mellon | Portugal program (MSIN CMU/Aveiro)
- October 2008 – present: Assistant Professor, Dept. of Electronics, Telecommunications and Informatics (DETI), University of Aveiro

1 Academic and teaching experience

Courses taught in the last 2 years (2008-2010):

Courses developed:

- "17623 – Software Engineering in Mobile Computing", Fall 2010, Carnegie Mellon University (CMU), EUA (graduate level): Course offered during Faculty Exchange at CMU. An structure comparison on code, design and architecture patterns on Mobile Computing (Android) and enterprise level framework (J2EE). Include a full project integrating both solutions.
- "Projecto em Engenharia Informática" – 2010/2011 (undergraduate): Undergraduate course on building software within Test Driven Development framework inspired in OpenUP. Supportted on web architecture with a major emphasis on team iterative development.
- "Testes e Qualidade de Software / Software *Quality and Testing*" - 2009/2010 - (undergraduate): Software engineering course focused on Test Driven Development on SOA projects (J2EE) supported on agile methodology and team work.
- "Computação Móvel / *Mobile Computing*"– 2009/2010 - (undergraduate): Basic concepts on mobile computing application development on Android and Windows Mobile environments.
- "Introdução à Computação Móvel / *Introduction to Mobile Computing*" - 2009/2010 - (undergraduate): Basic concepts on mobile computing application development on Android.
- "Engenharia de Software /*Software Engineering"* – 2008/2011 (undergraduate): Software engineering course focused on agile methodology using TDD, team work and SOA (J2EE). Concepts on software engineering and architecture.
- "Análise e Modelação de Sistemas de informação / *Analysis and modelling of information system*" – 2008 (undergraduate): Use case and domain modelling using UML. Concepts on software engineering and architecture

- "Information Systems Modelling", Professional Master in Information Networking (MSIN), dual degree of Carnegie Mellon and University of Aveiro , Fall 2009.

Supervisions

- Filipe Andrade Soares de Carvalho, "Sistema Judiciário Cabo-verdiano: indicadores do decorrer do Processo Penal", Master degree in Electronic and Telecomunications – Information System, 2011
- Márcio Colunas, "Droid Jacket: Sistema de Monitorização Móvel de uma Equipa / Droid Jacket: a Mobile Monitoring System for a Team", Integrated Master degree in Computer Engineering and Telematics, University of Aveiro, (co-supervision), 2010
- Fernanda Sofia Quintela da Silva Brandão, "Segmentation of deep grey matter structures by using magnetic resonance high.resolution T1-weighted images acquired at 3 Tesla; a technical approach", Medical Informatics Master, University of Porto (co-supervision), 2010
- Miguel Moreira,"Suporte ao diagnóstico em Acidentes Cardio Vasculares / Diagnosis support in stroke", Integrated Master degree in Computer Engineering and Telematics, University of Aveiro,(co-supervision), 2010
- José Gil Monteiro de Carvalho, "Sistema de Gestão de Informação Portuária (SGIP)", Master degree in Electronic and Telecomunications – Information System, (co-supervision), 2010
- Jair José Lopes Delgado, "Sistema de Informação de Apoio à Detecção de Perdas de Energia Eléctrica – O Caso da Electra", Master degree in Electronic and Telecomunications – Information System, (co-supervision), 2010
- Elisabeth Alves Andrade, "Sistema de Informação de Controlo de Assiduidade: Proposta para o caso da UniCV", Master degree in Electronic and Telecomunications – Information System, 2010
- Micael Pedrosa, "A web portal for Portuguese Brain Imaging Network", Integrated Master degree in Computer Engineering and Telematics, University of Aveiro, 2009
- David Pacheco," Ciência 2.0: Partilha de dados científicos na Grid / *Science 2.0: Sharing Scientific Data on the Grid*",Integrated Master degree in Computer Engineering and Telematics, University of Aveiro (co-supervision with Ilídio Oliveira), 2009
- Eduardo Dias," Quantificação tridimensional de movimento em epilepsia", Integrated Master degree in Electronic and Telecomunications, University of Aveiro (co- supervision with João Paulo Cunha), 2009
- Jacek L. Kustra, "Multimodal EEG-fMRI system for the study of epileptogenic focus", Master in BioMedical engineering, University of Aveiro (co-supervision), 2008
- Pedro Bruno Pereira Amaral, "Aplicação para visualização multimodal e manipulação de dados de Electrocorticografia /*Multimodal methods of visualization and manipulation of Electrocorticography data*", Integrated Master degree in Computer Engineering and Telematics, University of Aveiro (co- supervision), 2008

2 Research insterests

- Computer science
  - o Seamless integration of information system with mobile computing. The focus is two fold: (1) on software engineering and architecture integration patterns and (2) on information system integration of spatially distributed sources namely distributed data gathering and processing to support human resources decision and coordination. This line of work is partially integrated in VitalResponder project (http://www.vitalresponder.pt)
  - o Software architecture and complex workflows orchestrations: I started collaborating with the group lead by D. Garlan at the ISR/ Carnegie Mellon University focused on the validation and automation of complex analysis workflows in brain imaging using architecture styles and type checking as high level tools for verification and orchestration.
  - o Support to eScience: As part of ANFIC (Portuguese Brain Imaging Network - www.brainimaging.pt) I have been involved in the conception and evolution of the computational services available to the network.
- Neuroscience
  - o Exploring the use of independent regressor in the analysis of brain motor function in contrast with typical evoked potential approaches. The focus is in using motion quantification based in video to characterize the performance of the actual motion instead of relying in the protocol compliance in the motion related information.
  - o Support to Epilepsy and stroke diagnosis: although with less emphasis I still mantain a collaboration with the Epilepsy surgery program in HUC (Coimbra) namely in the registration of

Research positions

- Research proposals (name, reference, funding entity)
  - PI in proposal PTDC/EEA-ELC/121280/2010 - "NeuroMove: Movement Quantification in Neurological Diseases: A Multimodal Multi-dimensional Approach" - submitted to FCT, under revision
- Member of the following undergoing projects (name, reference, funding entity)
  - VitalResponder - "Vital Responder - Monitoring Stress among First Responder Professionals" - CMU-PT/CPS/0046/2008 (Carnegie Mellon - Portugal program)
  - MISC - "MISC—Massive Information Scavenging with Intelligent Transportation Systems" - MIT-Pt/TS-ITS/0059/2008 (MIT Portugal program)
  - "Rede Nacional de Imagiologia Funcional Cerebral ",REDE/1519/RNIFC/2006 , PROGRAMA NACIONAL DE RE-EQUIPAMENTO CIENTÍFICO, FCT
- Member of research team of the following projects (past projects):
  - "BING –Brain Imaging Network Grid", GRID/GRI/81833/2006 - Portuguese national GRID iniciative, FCT.
  - "GERES-med: Grid-Enabled REpositorieS for medical applications" GRID/GRI/81819/2006, Portuguese national GRID iniciative, FCT.
  - "MovEpil3D - 3D movement quantification in epilepsy ", PTDC/SAU-BEB/72305/2006 – FCT
  - "Neural correlates of object recognition: structure-function correlations within the visual ventral stream, striatal and limbic circuits in health and disease", PTDC/PSI/67381/2006 - FCT.
  - "E-Science grid facility for Europe and Latin America - EELA -2", 7th Framework Programme, Capacities of the European Commission
  - "EpilBI - Epileptogenic focus localization in a 3D multimodal Brain Imaging system", POSC/EEA-CPS/60977/2004 – Fundação para a Ciência e Tecnologia (FCT).
  - "Topo3D – Statistical Topographic Analysis of 3D Spatial and Temporal Distribution of Epileptic Spikes and its Sources in Realistic Brain Models", project POSI/CPS/39758/2001 - FCT. (2002-2005)
  - "Fusion – Functional and Morphologic Data Fusion for Epileptogenic Foci Localization on Surgery Candidate Patients" – PRAXIS /P/EEI/12150/1998 - FCT. (1998-2001)
  - "MovEpil – Movement Quantification in Epilepsy: a new Contribution for Epileptic Seizures Classification" – Praxis POSI/CPS/33802/99 – FCT (2000 –2002).
  - SADHIO (modelação e previsão de dosagens de Warfarin a doentes hipocoagolados) - Bolsa BIC do programa Praxis XXI PRAXIS XXI/BIC/12256/96 (1997-1999).
- Selected collaborations in the projects/proposals:
  - Project proposal Healing– "Health Application Layer for Infrastructures using Grids", – IST 2002 (FP6-2002-IST-1 – proposal 27374), European Comission.
  - Project Team-HOS - Methodology and Tools for World-best Teamwork in Hospitals - IST-DGXIII (Jan 2000 – Dez 2002).
  - Project HANSA - "Healthcare Advanced Networked Systems Architecture" - Projecto Europeu – Telematics DGXIII (Jan 1996 – Dez 1998) - http://www.gesi.it/hansa .

3 Publications

Thesis

Fernandes, J. M. (2007), "EpiGauss: spatio-temporal characterization of brain activity in Epilepsy/EpiGauss: caracterização espaço-temporal da actividade cerebral em Epilepsia", PhD thesis in PhD in Electrotecnical Engineering, University of Aveiro, Portugal

Fernandes, J. M. (1998), "MAGOO - Metodologia baseada em Agentes e Orientada por Objectos para resolução de Problemas Distribuídos: uma aplicação à gestão de trânsito/ MAGOO – Agent based methodology and Objected Oriented principles for problem solving: an application to traffic managment", MSc thesis in Computer Science, Faculty of Sciences, University of Oporto, Portugal

International journals

Fernandes, J. M., A. Martins da Silva, G. M. Huiskamp, D. N. Velis, I. Manshanden, J. C. de Munck, F. Lopes da Silva and J. P. Cunha (2005). "What Does an Epileptiform Spike Look Like in MEG? Comparison Between Coincident EEG and MEG Spikes", J Clin Neurophysiol **22**(1): 68-73.

Proceedings in international conferences with referee (2008 …)

Dwivedi V, P.V. Elizondo, J.M. Fernandes, D. Garlan, B. Schmerl (2011), "An Architectural Approach to End User Orchestrations " submitted to ECSA 2011.

Fernandes J.M., S. Tafula, J.P.S. Cunha (2011), "3D-Video-fMRI: 3D motion tracking in a 3T MRI environment", accepted in ICIAR2011, Burnaby BC, Canada.

Fernandes J.M., S. Tafula, J.P.S. Cunha (2011), "Different fMRI activations if a response box or a 3D movement tracking system is used", accepted in HBM 2011, Quebec City, Canada.

Oliveira, I.C. , E. Dias, L. Alves, J. Barros, J. Silva, M. Monteiro, A. Sousa-Pereira, J. M. Fernandes, A. Campilho and J.P.S. Cunha (2011),"Extending a desktop endoscopic capsule video analysis tool used by doctors with advanced computing resources" accepted in IberGrid2011, Santander, Spain.

Cunha J.P.S., J.M. Fernandes, V. Bento, L. Paula, E. Dias, C. Bilgin, S. Noachtar (2010), "2D versus 3D approaches to movement quantification in epileptic seizures: Simulations and real seizures comparative evaluation.", 9th European Congress on Epileptology, Rhodes, Greece.

Cunha J.P.S., J. M. Fernandes, A. Peters, C. Bilgin, J. Rémi, Z. Mirzadjanona, J.A. Gonzalez-Victores , S. Noachtar (2010) "Quantitative Analysis of Upper Limb Automatisms in Temporal and Frontal Lobe Epilepsy", 9th European Congress on Epileptology, Rhodes, Greece.

Cunha, J.P.S., S. Tafula, J. M. Fernandes (2010) "3D video-fMRI: Tri-dimensional video-based movement quantification in a 3T fMRI environment", Human Brain Mapping 2010, Barcelona, Spain.

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Patents:
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- Carlos Correia, Ricardo J. Machado, Marco Couto, Patrícia Pinto, Paula Monteiro, Sérgio Oliveira, Armando Almeida, Teresa McIntyre, Maribel Santos, Isabel Ramos, Carlos Oliveira. Ubiquitous Analgesia Control System for the Real time Monitoring of Acute and Chronic Pain. U.S. Patent and Trademark Office, U.S.A., submission ref. No. US38789 (18/Sep/2008).
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Awards:
- 2009 IEEE MGA Achievement Award, "for outstanding accomplishment and contributions towards the implementation of the 2009 IEEEXtreme Programming Contest".
- Award SEDES'2007 (2o Simpósio Doutoral em Engenharia de Software) for the best PhD thesis proposal (awarded to my PhD student Francisco Duarte).
- Award APDIO'2003 (Associação Portuguesa de Investigação Operacional) for the best MSc dissertation of 2003 (awarded to my MSc student Luís Pinto Ferreira).
- Award ENCEE'97 (3o Encontro Nacional do Colégio de Engenharia Electrotécnica da Ordem dos Engenheiros) for the paper in the area of "Computador and Software Systems"
- Award ETC'95 (Texas Instruments European Technical Conference), "for the excellent contribution as technical author"
- Award TIEP'94, for the best students of UP, UA e UC in Electrical and Computer Engineering, within the Programa UNIVERSIDADE da Texas Instruments - Equipamento Electrónico (Portugal), Lda.