Curriculum Vitae – José Miguel Paiva Proença

CONTACT INFORMATION
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NATIONALITY
Portuguese

RESEARCH INTERESTS
Software engineering, Concurrency, Coordination models, Wireless sensor networks, Product line engineering, Formal methods, Functional programming languages.

SHORT BIO
I graduated from the University of Minho as the best student in Math & Computer Science (2005), and continued to do my PhD in CWI, Amsterdam – a research institute in the top 28 of Europe and top 83 worldwide (`http://research.webometrics.info`). I worked on coordination models: models that describe how runtime components can interact with each other under the supervision of Prof. Farhad Arbab. In 2010 I moved to KU Leuven University, in Belgium – a university in the top 11 of Europe and top 77 worldwide (same source as above). I continued to work in the coordination field and investigated variability within the HATS european (FP7) project, collaborating mainly with Prof. Dave Clarke. In 2014 I started to collaborate within the Wireless Sensor Group, mainly with Prof. Danny Hughes, where I modelled and experimented with communication models in resource-constraint devices. In 2015 I returned to U.Minho, working as a post-doctoral researcher collaborating with Prof. Luis Barbosa, and taught as an invited assistant professor at U.Minho (2016-1019). I now work at CISTER/ISEP since February 2019, investigating coordination aspects in the context of Cyber-Physical Systems. Currently I am involved in the Lightkone european project (H2020) since January 2017, and I am leading the FCT project DaVinci since July 2018.

EDUCATION

– *PhD* **January 2006 – December 2009**
  - Organisation: Research work at Centrum Wiskunde & Informatica (CWI), degree awarded by Leiden University (LIACS), Leiden, The Netherlands
  - Supervisors: Farhad Arbab (CWI and LIACS), Dave Clarke (KUL), and Erik de Vink (Eindhoven University of Technology – TUE)
  - Topic: Deployment of Distributed Component Based Systems
  - Core subjects: Coordination, concurrency, component-based systems, formal methods

– *Integrated MSc* **September 2000 – October 2005**
  - Organisation: University of Minho (UM), Braga, Portugal
  - Degree: Licenciatura on Math & Computer Science (5-year degree) in 2005
  - ERASMUS mobility: 1 full semester of courses at University of Bristol, UK, in 2004
  - Internship: 1 month at University of Kent, in Canterbury, UK, working with Prof. Simon Thompson, during the final year project in 2005
  - Final grade: 18/20 (best for that year & degree)

– *Summer schools*
  - *2nd International Summer School on Deep Learning*, in Genova, Italy, 2018;
    Summer school on the recent advances of deep learning, covering theory and practice.
  - *School on Formal Models for Objects and Components*, in Bertinoro, Italy, 2012;
    Summer school covering areas such as type theory, programming languages, formal methods, concurrency and software engineering.
  - *Trends in Concurrency*, held in Prague, Czech Republic, 2008;
    Summer school on current research and future trends in concurrent systems design and implementation, including well-known speakers such as Martin Odersky and Byron Cook, among others.
  - *Summer School on Language-Based Techniques for Integrating with the External World*, in the University of Oregon, Eugene, USA, 2007;
    Summer school on programming languages, sponsored by ACM and Microsoft.

- *Marktoberdorf Summer School*, in Marktoberdorf, Germany, organised by NATO, 2006; Summer school on dependable software systems engineering, including the turing-awarded organisers and speakers Amir Pnueli and Tonny Hoare.
- *IPA Spring and Fall Schools* – I attended a school every spring and fall from 2006 until 2009, in different cities in the Netherlands, over a range of topics in computer science for PhD students and organised by IPA – Institute for Programming research and Algorithmics (`http://www.win.tue.nl/ipa/`).
- *Midland Graduate School*, in the University of Birmingham, UK, 2005;
  Summer school on Foundations of Computing Science, including the topics: category theory, typed lambda-calculus, denotational semantics, and functional programming.

– *Secondary School* **September 1997 – June 2000**

- Organisation: Escola Secundária Carlos Amarante, Braga, Portugal
- Core subjects: Mathematics, Physics and Chemistry
- Final grade: 19/20

Work Experience

– *Invited Assistant Professor ("Professor Auxiliar")* **Fev 2016 – Fev 2019**

- Organisation: University of Minho (UM), Braga, Portugal
- Prepared and taught the course: "Software Architecture and Design Calculi", at a MSc degree (2016-`http://ac1516.proenca.org`, 2017-`http://ac1617.proenca.org`, and 2018-`http://arca.di.uminho.pt/ac-1718`)
- Planned and lectured the course: "Mathematics for Computer Science", under the program Qualifica-IT for the requalification of software scientists (2017-`http://mi1718.proenca.org`).
- In charge of lab classes of the courses:
  - "Functional Programming", for first year students (2016/17 and 2017/18);
  - "Laboratory of Informatics I", for first year students (2016/17, 2017/18, 2018/19);
  - "Laboratory of Informatics II", for first year students (2017/18);
  - "Program Calculation", for third year students (2016/17).

– *Senior Researcher* **Feb 2019 – present**

- Organisation: CISTER (ISEP), Porto, Portugal
- Topic: Coordination and monitoring of components in Cyber-Physical Systems

– *Post-doctoral Researcher* **Feb 2018 – Jan 2019**

- Organisation: University of Minho (UM), Braga, Portugal
- Project leaders: Luís Barbosa (UM)
- Context: Chair PT-FLAD on Smart Cities & Smart Governance
- Topic: Coordination of concurrently evolving software components

– *Post-doctoral Researcher (FCT grant)* **Mar 2013 – Jan 2014, Feb 2015 – Jan 2018**

- Organisation: University of Minho (UM), Braga, Portugal *and* KU Leuven University (KUL), Leuven, Belgium
- Project leaders: Luís Barbosa (UM) and Dave Clarke (KUL)
- Topic: Adaptable coordination
- Core business: Hybrid modelling of variability for synchronous coordination systems

– *Post-doctoral Researcher* **February 2010 – January 2016**

- Organisation: KU Leuven, Belgium
- Project leaders: Dave Clarke (KUL) and Danny Hughes (KUL)
- Topic: Highly Adaptable and Trustworthy Software using Formal Models
- Core business: Specification and analysis of both variability in a concurrent language and component models for embedded devices.

– *PhD Researcher (FCT grant)* **January 2006 – December 2009**

- Organisation: Centrum Wiskunde & Informatica (CWI), Amsterdam, The Netherlands
- Research interests: Coordination, Distributed systems, Formal methods.

– *Software engineer (work contract)* **November 2005 – December 2005**
  - Organisation: MULTICERT – Serviços de Certificação Electrónica SA, Porto
  - Type of business or sector: Company on software certification
  - Main activities and responsibilities: Programming, documenting and validating the implementation of certification standards.

– *Researcher (BIC grant)* **April 2005 – October 2005**
  - Organisation: PURE Project, Dep. Informática, Universidade do Minho;
  - Type of business or sector: Scientific research in Computer Science.
  - Main activities and responsibilities: Study and development of automatic program transformations;

– *Demonstrator* **February 2004 to September 2004**
  - Organisation: Dep. Informática, Universidade do Minho;
  - Type of business or sector: Higher Education.
  - Main activities and responsibilities: Teaching, tutorial guidance and project marking in a Computer Science subject;

Prizes & Awards

- Post-doctoral Fellowship by the Portugues foundation FCT (SFRH/BPD/91908, 2012);
- PhD Studenship by the Portugues foundation FCT (SFRH/BD/22485, 2005);
- Best graduated student in Computer Science at U.Minho, awarded by the Minister of Science, Technology and Higher Education, 2005;
- Best project in Cryptography at U.Minho, awarded by the company MultiCert, 2005;
- Best student in Computer Science at U.Minho in 2002, 2003, 2004, and 2005: awarded 4 Scholarship Merits;
- Best student that applied for the Computer Science degree, U.Minho, 2001, awarded a Scholarship of Excelence ("Prémio Conselho Académico").

Key publications

This selection of 5 papers reflects my most active areas of research in the last 5 years, sorted chronologically, including 2 journal versions and 3 conference proceedings. All selected conferences and journals are different. The papers are freely available at `http://jose.proenca.org/publications`. The full publication list is included at the end of this CV.

1. *Teaching how to program using automated assessment and functional glossy games (experience report)* [15], José Bacelar Almeida, Alcino Cunha, Nuno Macedo, Hugo Pacheco, José Proença, Proceedings of the ACM on Programming Languages volume 2, ICFP, article 82, 2018.

   Overview: It reports our experience of restructuring, over the last 5 years, a laboratory course unit on functional programming for first year students. We have been using game programming to keep students motivated, and following a methodology that hinges on test-driven development and continuous bidirectional feedback.

   The target conference is a top conference for programming languages (CORE A* conference), and this work reflects an ongoing interest in functional programming and education.

2. *Composing Families of Timed Automata* [18], Guillermina Cledou, José Proença, Luís Barbosa, Lecture Notes in Computer Science, FSEN 2017.

   Overview: This article addresses the challenge to analyse large systems composed out of concurrent components, each with a timed behaviour captured by a Timed Automaton. It proposes a new formalism to facilitate the modular construction of complex networks of timed automata, taking variability into account and focusing on the architecture of the network.

   This paper illustrates recent lines of research to reason about Timed systems, and was followed by a later conference publication exploring refinement notions of timed automata [17].

3. *Typed Connector Families and their Semantics* [1], José Proença, Dave Clarke, Special Issue published in Science of Computer Programming, Elsevier, volume 146, pages 28–49, 2017. Extends a conference publication at FACS 2015.

   Overview: It is motivated by the need to describe interactions between families of components (families as in Software Product Lines). It presents an algebra of connectors, which can be seen as a variableless programming language with algebraic properties, extended with parameters and constraints over the parameters (to model software product lines of connectors). It includes a type system and a prototype engine for type checking.

   The SCP journal advertises an impact factor of 0.828, and impacts of 1.38 (SNIP 2015) and 0.57 (SJR 2015). This paper combines 2 areas that I have previously investigated separately: coordination languages and software product lines, and represents an active research interest.

4. *Refraction: Low-Cost Management of Reflective Meta-Data in Pervasive Component-Based Applications* [21], Wilfried Daniels, José Proença, Dave Clarke, Wouter Joosen, Danny Hughes, CBSE 2015, ACM SIGSOFT, 2015.

   Overview: It tries to reduce the energy costs needed to inspect and update the configurations of a network of battery-powered devices (as in the IoT). The proposed approach uses the unused space in the payload of frames sent by the running components to propagate configuration-related data. Globally-defined rules define how components react to this information to collect the information about the running system.

   The target conference is an important venue for component-based software (CORE A conference), and this work is one out of 2 publications accepted there, reflecting collaborations with the group on Wireless Sensor Networks at KUL, where I contributed with a more formal and fundamental perspective.

5. *Feature Nets: behavioural modelling of software product lines* [4], Radu Muschevici, José Proença, Dave Clarke, International Journal on Software and Systems Modeling (SoSyM), Springer, 2015.

   Overview: This recent journal version extends 2 of my previous publications on software variability: one published in 2010 [36] in a workshop affiliated to SPLC (a reference conference on Software Product Lines, 2010), and the other published in 2011 [32] in SEFM (a conference in software engineering and formal methods with LNCS-Springer proceedings). It extends Petri Nets with constraints to reason about families of such nets, including approaches for modular development and for verification of properties.

   The SoSyM journal advertises an impact factor of 0.99 and Google Scholar finds 30 papers citing the SPLC workshop paper and 20 citing the SEFM paper.

Edited proceedings and books

- *Special Issue of COORDINATION and FORTE 2016 (Journal)*, Logical Methods in Computer Science, Episciences, Volume 13, 2017. `https://lmcs.episciences.org/volume/view/id/293`
- *International Conference on Formal Aspects of Component Software (FACS)* , José Proença, Markus Lumpe (Editors), FACS 2017, Lecture Notes in Computer Science, Volume 9686, 2016. `http://dx.doi.org/10.1007/978-3-319-39519-7`
- *IFIP conference: Coordination Models and Languages* , Alberto Lluch Lafuente, José Proença (Editors), COORDINATION 2016, Lecture Notes in Computer Science, Volume 10487, 2017. `https://link.springer.com/book/10.1007/978-3-319-68034-7`
- *International Workshop on Foundations of Coordination Languages and Self-Adaptive Systems (FOCLASA)* , José Proença, Massimo Tivoli (Editors), FOCLASA 2015, Electronic Proceedings in Theoretical Computer Science, Volume 201, 2015. `http://dx.doi.org/10.4204/EPTCS.201`
- *International Workshop on Foundations of Coordination Languages and Self-Adaptive Systems (FOCLASA)* , Javier Cámara, José Proença (Editors), FOCLASA 2014, Electronic Proceedings in Theoretical Computer Science, Volume 175, 2015. `http://dx.doi.org/10.4204/EPTCS.175`

- *Synchronous Coordination of Distributed Components*, José Proença, (supervisors: Farhad Arbab, Dave Clarke, Erik de Vink), PhD thesis, Leiden University, 2011.

University Teaching

- **Invited Assistant Professor** in charge of lab classes of the courses:
  - *Functional Programming* in U.Minho (16/17 and 17/18);
  - *Laboratory of Informatics for functional programming* in U.Minho (16/17, 17/18, and 18/19);
  - *Laboratory of Informatics for imperative programming* in U.Minho (17/18);
  - *Program Calculation* in U.Minho (16/17).
- **Invited Assistant Professor** to deliver the MSc course *Arquitectura e Cálculo* (Software Architecture and Design Calculi) in U.Minho (15/16, 16/17, and 17/18), including the preparation of slides, tutorials, assignments, and exams (`http://ac1516.proenca.org`, `http://ac1617.proenca.org`, and `http://arca.di.uminho.pt/ac-1718`).
- **Teaching Assistant** at KU Leuven; undergraduate courses:
  - Practical project with constrained devices (P&O, 13/14, 14/15).
  - Software design in object-oriented languages (SWOP, 11/12, 12/13, 13/14),
  - Comparative Programming Languages (CPL, 12/13),
  - Operating Systems (BS, 12/13),
  - Introduction to the object-oriented paradigm (OGO, 11/12),
- **Invited lectures**:
  - 2 lectures on the Comparative Programming Languages course (KU Leuven, 12/13),
  - introductory lecture on Functional Programming (Petrozavodsk State University, Russia, Nov. 2012),
  - lecture on the Reo coordination language (U.Minho, Braga, Apr. 2013).
- **Supervisor** of the following MSc theses:
  - Rúben Cruz, *Web-based analysis of families of Reo connectors* (Univ. Minho, 2017/18 - ongoing);
  - Sam Gielis, *A reactive, extensible & modular Dashboard Factory for WSN monitoring* (KU Leuven, 2015);
  - Jonas Flament, *Encoding Scala with Logic* (KU Leuven, 2014);
  - Wouter Seyen, *Delta Modelling Evaluation using ABS Language* (KU Leuven, 2012);
- **Involved in the supervision** of the work carried in the PhD theses:
  - Guillermina Cledou (U.Minho, defense scheduled for Nov. 2018)
  - Wilfried Daniëls (KU Leuven, defended in 2018)
  - Gowri Sankar Rang (KU Leuven, defended in 2017)
  - Radu Muschevici (KU Leuven, defended in 2013)

Management of Science

- **General Chair and Local Organizer**
  - *FACS 2017*, 14th International Conference on Formal Aspects of Component Software, held in Braga, Portugal.
- **Chair of Program-Committees**
  - *F-IDE 2019*, 5th Workshop on Formal Integrated Development Environment, co-located with the Formal Methods 2019 conference, to be held in Porto, Portugal; co-chaired with Rosemary Monahan, from Maynooth University, and Virgile Prevosto from the University of Paris-Saclay; Edited proceedings will be available in Electronic Proceedings in Theoretical Computer Science (EPTCS).

  - *FACS 2017*, 14th International Conference on Formal Aspects of Component Software, held in Braga, Portugal; co-chaired with Markus Lumpe, from the Swinburne University of Technology, Australia; Edited proceedings available in Lecture Notes in Computer Science (LNCS), and a special issue is being organised for Science in Computer Programming (Elsevier Journal).
  - *COORDINATION 2016*, IFIP International Conference on Coordination Models and Languages (CORE A conference), part of the 3 DisCoTec conferences, held in Heraklion, Greece; Co-chaired with Alberto Lluch Lafuente, from the Technical University of Denmark; Edited proceedings available in Lecture Notes in Computer Science (LNCS), and a special issue is being organised for Logical Methods in Computer Science (LMCS).
  - *FOCLASA 2015*, International Workshop on Foundations of Coordination Languages and Self-Adaptive Systems, held in Madrid, Spain; co-chaired with Massimo Tivoli, from the University of L'Aquila, Italy; Edited proceedings available in Electronic Proceedings in Theoretical Computer Science (EPTCS).
  - *FOCLASA 2014*, International Workshop on Foundations of Coordination Languages and Self-Adaptive Systems, held in Rome, Italy; co-chaired with Javier Cámara, from Carnegie Mellon University, USA; Edited proceedings available in Electronic Proceedings in Theoretical Computer Science (EPTCS).

- **Member of Steering-Committees**
  - *COORDINATION* – IFIP International Conference on Coordination Models and Languages (CORE A conference), for the years **2017**, **2018**, and **2019**.
  - *FACS* – International Conference on Formal Aspects of Component Software, for the years **2018** and **2019**.

- Creation and management of a **research cluster Arca** (`http://arca.di.uminho.pt`) within HASLab, about Software Architecture & Design Calculi, including the organisation of periodic seminars and maintaining an up-to-date website with current research activities and outcomes.

Other Scientific Activities

- **Member of Program-Committees**
  - *FSEN* – IPM International Conference on Fundamentals of Software Engineering, for the years **2013**, **2015**, **2017**, and **2019**.
  - *FACS* – International Conference on Formal Aspects of Component Software, for **2014**, **2017**, **2018**, and **2019**.
  - *FOCLASA* – International Workshop on Foundations of Coordination Languages and Self-Adaptive Systems, for the years **2012**, **2013**, **2014**, **2015**, and **2018**, and **2019**.
  - *REBLS* – International Workshop on Reactive and Event-Based Languages & Systems, for **2018**.
  - *PhD-iFM* – International Conference on integrated Formal Methods – PhD Symposium on Formal Methods: Algorithms, Tools and Applications, for **2018**.
  - *AlgoSensors* – International Symposium on Algorithms and Experiments for Wireless Networks, for **2018**.
  - *COORDINATION* – IFIP International Conference on Coordination Models and Languages, for the years **2012** and **2016** (this last year as Chair).

- **Juri in PhD defences** of the following PhD researchers:
  - Fan Yan (KU Leuven, private defence on Jan 2019);
  - Guillermina Cledou, *A Virtual Factory for Smart City Service Integration* (U.Minho, 12 Nov 2018);

- **Juri in MSc thesis** of the following MSc projects:
  - Sven Akkermans, *Supporting the Internet of Things: IPv6 multicase in publish/subscribe middleware* (KU Leuven, 2015);
  - Vincent Goossens, *Reification of monads for parser combinators* (Monadreïficatie voor Parsercombinatoren) (KU Leuven, 2015);
  - Wim Beck, *Verifying Noninterference with a Whitebox Fuzzer* (KU Leuven, 2011);

- Ruben Vandevelde, *Self-protecting modules* (Efficiënte isolatie van software modules in standaard besturingssystemen), (KU Leuven, 2011).

- **Reviewer** for the following 62 editions of 18 journals and 44 publications on international peer-reviewed conferences and workshops: FSEN'07,13,15,17,19; Conc.& Comp. (Wiley journal)'19; FORTE'13,17,18; SCP (Elsevier journal)'11,13,14,18,19; SoSyM (Springer journal)'14,18,19; FM'16,18; REBLS'18; VORTEX'18; AlgoSensors'18; FACS'08,12,14,18; FOCLASA'06,12,13,14,15,18; Inf. and Comp. (Elsevier journal)'18; PhD-iFM '18; JSS (Elsevier journal)'17; SEFM'17; FASE'17; JLAMP (Elsevier journal)'14,15,17; COORDINATION'08,09,12,13,15,16; SBCAR'16;
SBLP'16; ESOP'12,16; COMLAN (Elsevier journal)'15; FAOC (Springer journal)'15;
ECOOP'15; JSC (Elsevier journal)'14; iFM'13; ICFEM'12; Distributed Computing (Springer journal)'11; ICSOFT'11; SAC'11; SCICO'09,10; TOOLS'09;

Applied Research

This section compiles research activities with a more practical application.

- *Case-study in the DaVinci project* – The industrial partner of this recent FCT project, which I'm leading, is Altreonic: a Belgium company developing software for Real Time embedded systems. I visited them in September 2018, and are on ongoing collaboration to devise orchestration mechanisms between tasks being scheduled in a real time operating system. The specific case-study consists of the analysis of the software running in the modular electric cars being built at Altreonic, the *Kurt vehicles*, including a remote steering functionality.

- *Case-study in the LightKone project* – One of the case-studies in the LightKone project was given by the German company Peer Stritzinger GmbH, consisting of a network of nodes attached to a conveyor belt in a manufacturing process. Each node interacts with RFID tags placed on products being assembled, and controls where these products should go. Furthermore, nodes share information about these tags. I formalised this use-case using a model-checker for timed-automata, reasoning about the time the building process could take.

- *Analysis and verification of WSN* – I was part of a group working on Wireless Sensor Networks in KU Leuven, Belgium, in 2013-2015. During that period, I developed algorithms and approaches to analyse and monitor wireless sensor applications, leading to several publications [21, 22, 24, 30]. The work carried at this group led to a spin-off company —VersaSense.com—providing an IoT platform for industrial facilities.

- *Participation in the TRANSITION project (2014-2015)* – This was a Belgium project carried at KU Leuven, supported by an Industrial Research Fund aiming at a closer collaboration with industrial partners. It combines efforts between the computer science department (DistriNet group) and the mechanical engineering department (PMA group), investigating how to use lightweight wireless nodes to interact and reconfigure larger robots.

- *Open-source software artefacts* – Some of my proposed concepts and methodologies are supported by a companion tool or library that realises it. These are listed in the Tool Development section (page 8), including frameworks to verify software connectors that rely on external model checkers and constraint solvers.

Participation in projects

- **DaVinci** (Jul. 2018-present – **Principal Investigator**)—*Distributed Architectures: Variability and Interaction for Cyber-Physical Systems*—is an FCT project to analyse interactions among software components considering aspects such as real time and variability.

- **KLEE** (Jun. 2018-present)—*Coalgebraic Modeling and Analysis for Computational Synthetic Biology*—is an FCT project that aims at the design of biological systems in a systematic way, using the theory of coalgebras.

- **LightKone** (Dec. 2016-present)—*Lightweight computation for networks at the edge*—is a **H2020 european project** aiming at investigating models for programming edge networks. An edge network is a large set of heterogeneous, loosely coupled computing nodes situated

at the logical extreme of a network, including networks of Internet of Things and mobile devices.

- **TRUST** (Sep. 2016-present)—*Trustworthy Software Design with Alloy*—is an FCT project that proposes to investigate lightweight approaches to verify software systems via the Alloy toolset, considering aspects such as variability of systems.
- **EMD** (2015-2016)—*Elastic Media Distribution for Online Collaboration*—is an **ICON project**, Funded by iMinds and IWT (Belgium), and investigates how professional A/V systems can be integrated into corporate and public networks;
- **TRANSITION** (2014-2015)—*From Ad-Hoc Code Development To Code Reuse Through Middleware For Networked Embedded Control Systems*—is an **IOF (Industrial Research Fund) project** funded by KU Leuven, targeting the collaborations between the PMA and the Distrinet groups aiming at technology transfer;
- **HATS** (2010-2013)—*Highly Adaptable and Trustworthy Software using Formal Models*—was an Integrated Project supported by the **7th Framework Programme of the EC** within the FET (Future and Emerging Technologies) scheme, evaluated as "Excelent" in the final report;
- **DesignerTypeLabs** (2010-2013)—*Hybrid Enforcement and Certification of Domain Specific Program Annotations*—was a **BOF/START project** funded by KU Leuven University.

TOOL DEVELOPMENT

- **ArcaTools** – Web-based interactive framework to combine existing (independent) Reo tools [16] and tools for hybrid programming, previously known as *ReoLive*. It consists of a Scala and JavaScript implementation of a framework that provides the bridge between a browser-based IDE and a set of tools, using several widgets to provide quick feedback over the connectors or programs being build. Available at `https://github.com/ReoLanguage/ReoLive`, and usable at `http://arcatools.org`.
- **HubAutomata** – Hub Automata for coordination of tasks on a Real-Time OS: an automata model that gives semantics to connectors combining tasks on the VirtuosoNext™ framework [13]. Available at `https://github.com/arcalab/hubAutomata`, and usable at `http://arcatools.org/#virtuoso`.
- **Lince** – Lightweight prototyping of Hybrid Programs. It uses a DSL for Hybrid Programs, and produces simulations that take advantage of symbolic computations by SageMath and of perturbation analysis using quadratic programming. Available at `https://github.com/arcalab/hybrid-programming`, and usable at `http://arcatools.org/#lince`
- **Preo** – Parameterised Reo: a concrete language for a calculus of variable connectors [1]. It consists of a Scala implementation of a set of tools to parse, compose, inspect, and visualise families of connectors based on the Reo coordination language. Available at `https://github.com/ReoLanguage/Preo`, and usable at `http://arcatools.org/#reo`.
- **HAAP** – Haskell Automated Assessment Platform [15]. It consists of a Haskell implementation of a platform used to automatically analyse and evaluate student assignments, used to teach first-year students how to program in Haskell. Available at `https://github.com/haslab/HAAP`.
- **ITFA** – Scala implementation of the Interface Featured Timed Automata [18]. It provides libraries with an embedded DSL to describe timed automata with variability, methods to provide complex composition mechanisms, and methods to export the resulting automata to the UPPAAL model checker or to different visualisers. Available at `https://github.com/haslab/ifta`.
- **PICC** – Partial Interaction Coordination Constraints [25] - an interactive Reo implementation. It consists of a Scala implementation that explores how to include constraints with side-effects when describing communication protocols, based on transactions with compensations. Available at `https://github.com/joseproenca/picc`.

Other Activities

- Member of the Ph.D. Council of the *Institute for Programming research and Algorithmics (IPA)* (http://www.win.tue.nl/ipa/), 2009/2010.
- Student representative of my undergraduate course (2^{nd}, 3^{rd}, 4^{th}, and 5^{th} years);
- Local organisation of JOIN'05 (http://join.di.uminho.pt) – *Jornadas de Informática*

Languages

Portuguese: Mother tongue
English: Excellent
Spanish: Good
French: Basic (3 years of courses)
Dutch: Basic (2 years of courses)
Russian: Basic (3 years of courses)
German: Poor (2 semesters of courses)

Porto, June 7, 2019

(José Miguel Paiva Proença)

Full list of publications, based on DBLP (http://dblp.uni-trier.de)

This list of publications includes only the peer-reviewed publications in international journals and proceedings, and does not include technical reports.

Journal publications

[1] José Proença and Dave Clarke. Typed connector families and their semantics. *Science of Computer Programming, Elsevier*, 146:28–49, 2017.

[2] Gowri Sankar Ramachandran, José Proença, Wilfried Daniels, Mario Pickavet, Dimitri Staessens, Christophe Huygens, Wouter Joosen, and Danny Hughes. Hitch hiker 2.0: a binding model with flexible data aggregation for the internet-of-things. *Journal of Internet Services and Applications, Springer*, 7(1):4:1–4:15, 2016.

[3] Sung-Shik T. Q. Jongmans, Dave Clarke, and José Proença. A procedure for splitting data-aware processes and its application to coordination. *Science of Computer Programming, Elsevier*, 115-116:47–78, 2016.

[4] Radu Muschevici, Jose Paiva Proenca, and Dave Clarke. Feature nets: behavioural modelling of software product lines. *Software and Systems Modeling (SoSyM)*, pages 1–26, Springer, June 2015.

[5] Peter Y. H. Wong, Elvira Albert, Radu Muschevici, José Proença, Jan Schäfer, and Rudolf Schlatte. The ABS tool suite: modelling, executing and analysing distributed adaptable object-oriented systems. *International Journal on Software Tools for Technology Transfer (STTT)*, Springer, 14(5):567–588, 2012.

[6] Dave Clarke, José Proença, Alexander Lazovik, and Farhad Arbab. Channel-based coordination via constraint satisfaction. *Science of Computer Programming, Elsevier*, 76(8):681–710, 2011.

Edited proceedings, journals, and books

[7] Elvira Albert, Ivan Lanese, Alberto Lluch Lafuente and José Proença, editors. newblock *Special Issue of COORDINATION and FORTE 2016*, volume 13 of *Journal of Logical Methods in Computer Science*. Episciences, 2017.

[8] José Proença and Markus Lumpe, editors. *Formal Aspects of Component Software - 14th International Conference, FACS 2017, Braga, Portugal, October 10-13, 2017, Proceedings*, volume 10487 of *Lecture Notes in Computer Science*. Springer, 2017.

[9] Alberto Lluch-Lafuente and José Proença, editors. *Coordination Models and Languages - 18th IFIP WG 6.1 International Conference, COORDINATION 2016, Held as Part of the 11th International Federated Conference on Distributed Computing Techniques, DisCoTec 2016, Heraklion, Crete, Greece, June 6-9, 2016, Proceedings*, volume 9686 of *Lecture Notes in Computer Science*. Springer, 2016.

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