

University Academic Curriculum Vitae

Personal information

Name: Tiago Prince Sales

Date of birth: 15/03/1990

Nationality: Brazilian

Google Scholar: <https://scholar.google.com/citations?user=bfaMR2YAAAAAJ>

Education

- **2012, Bachelor's Degree in Computer Science**
GPA: 7,83 out of 10
Universidade Federal do Espírito Santo, Brazil
- **2015, Master's Degree in Informatics**
GPA: 9,44 out of 10
Universidade Federal do Espírito Santo, Brazil
- **2019, Doctoral Degree in Information and Communication Technology**
Obtained a *Cum Laude* distinction for the outstanding quality of the research work and the additional title of *Doctor Europaeus*.
University of Trento, Italy

Present appointment

- **Assistant Professor**
Free University of Bozen-Bolzano, Bolzano – BZ (Italy)
From 10/2019 to now

Professional experience

- **Research Assistant**
Free University of Bozen-Bolzano, Bolzano – BZ (Italy)
From 07/2019 to 10/2019
Applied Research and Development activity in the context of the project “AlpineAnnotation: A Lightweight Data format and Proof-of-concept for INtErchanging culturAl eveNts aNd ski-resOrT”, a collaboration between UNIBZ and IDM Südtirol-Alto Adige. My main activities regarded the definition of an open standard (schema) for the description of cultural events and ski-resort information, as well as the development of a set of Application Programming Interfaces (APIs) for the exchange of information and testing data about events and ski-resort information.
- **Junior Associate Researcher**
Laboratory for Applied Ontology, ISTC-CNR, Trento – TN (Italy)
From 02/2016 to 10/2019
I have been a Junior Associate Researcher at the Laboratory for Applied Ontology for the last three years. In this context, I have collaborated in several research directions with the members of the laboratory and co-author a number of papers.
- **PhD Candidate**
University of Trento, Trento – TN (Italy)
From 11/2015 to 04/2019
I worked as a PhD candidate under the supervision of Prof. John Mylopoulos, Nicola Guarino and Prof. Giancarlo Guizzardi. During this period, *I received a scholarship grant funded by the Lucretius ERC project*. My PhD research was on the ontological foundations of strategic business modeling, with a focus on the notions of value, risk and competition.

- **Visiting Researcher**
Ghent University, Ghent (Belgium)
From 04/2019 to 10/2019

During my PhD, I went on a research mobility to the UGent Business Informatics Research Group at Ghent University, where I worked on the development of an ArchiMate extension for value modeling. In this period, I was hosted by and collaborated with Prof. Frederik Gailly and Prof. Geert Poels.
- **Co-founder and Lead Ontologist**
Menthor, Vitória – ES (Brazil)
From 11/2014 to 10/2018

I co-founded Menthor, a spin-off of the Ontology and Conceptual Modeling Research Group (NEMO) whose goal was to develop ontology-based software solutions. My main role within the company was of Lead Ontologist. A noteworthy project carried out by Menthor was the development of a semantic annotation and search tool for Globosat, the largest broadcasting company in South America. In this project, I was responsible for: (i) designing and implementing the ontologies around which the software was developed; (ii) transforming legacy data into the ontology's format; (iii) eliciting requirements for the software under development; and (iv) implementing both front-end and back-end features.
- **Ontology Engineering Consultant**
Federal University of Ceará, Fortaleza – CE (Brazil)
From 07/2015 to 10/2015

I worked as an ontology engineering consultant in an R&D project sponsored by Petrobras (a Brazilian multinational petroleum corporation), which aimed to integrate several legacy databases. My main activities included: (i) training the project's team in ontology-driven conceptual modeling; and (ii) coaching the design of the ontology developed within the project.
- **Ontology Engineer**
Instituto Atlântico, Fortaleza – CE (Brazil)
From 04/2015 to 10/2015

I worked as an ontology engineer in an innovation project sponsored by the Brazilian Health Ministry, which aimed to develop a decision-support system for public health managers. My main activities included: (i) training the project team in ontology-driven conceptual modeling and semantic web technologies; (ii) developing domain ontologies; and (iii) implementing scripts to transform and integrate legacy data in semantic web formats.
- **Visiting Researcher**
Polytechnic University of Valencia, Valencia (Spain)
From 11/2015 to 04/2019

During my masters, I did a research mobility at the Research Center on Software Production Methods, in which I investigated the integration of the Unified Foundational Ontology and the OO-Method. In this period, I was hosted by and collaborated with Prof. Oscar Pastor.
- **Ontology Engineer**
Fundação Euclides da Cunha, Niterói – RJ (Brazil)
From 04/2012 to 06/2014

I worked as an ontology Engineer in a R&D project for the Brazilian

Ground Transportation Agency, which aimed to improve decision making within the agency and support open data publication. My main activities included: (i) designing domain ontologies; (ii) assessing the interoperability context and challenges within the agency; (iii) prototyping software solutions to support data interoperability; and (iv) developing software tools to support the validation of ontologies developed within the project.

Experience in teaching

- I have taught the following courses:
 - **Ontology Engineering (2015)**
At the Federal University of Ceará, Fortaleza, Brazil
This course covered ontology engineering and semantic technologies with an emphasis on how to design and validate models using OntoUML. It was taught to graduate students, researchers and practitioners participating at a research project at the university.
 - **Ontology-driven Conceptual Modeling (2015)**
At the Instituto Atlântico, Fortaleza, Brazil
This course covered ontology-driven conceptual modeling, in general, and of OntoUML, in particular. It was taught to a team of developers that was working on the development of a platform that needed to integrate public health data.
 - **An Introduction to Ontology-driven Conceptual Modeling (2014)**
At the Centro Universitário do Estado do Pará, Belém, Brazil
This tutorial introduced the field of Ontology-driven Conceptual Modeling to computer science bachelor students of the Centro Universitário do Estado do Pará (<http://www.cesupa.br/>).
 - **Ontology Engineering (2014)**
At the Brazilian Ground Transportation Agency, Brasília, Brazil
This course was designed to train public employees of the Brazilian Ground Transportation Agency (<http://antt.gov.br/>) on Ontology-driven Conceptual Modeling and Ontology Engineering.
- I co-supervised two master's thesis and one bachelor thesis on topics related to Conceptual Modeling and Enterprise Modeling. One of the master's students was able to publish the result of his work on an international peer-reviewed conference.

Service to the Scientific Community

- I have worked as a **program committee member** at the following scientific events:
 - International Workshop on Formal Ontologies Meet Industry (FOMI) since 2017;
 - Seminar on Ontology Research in Brazil (ONTOBRAS) since 2018;
 - Enterprise Engineering Working Conference (EEWC) since 2018;
 - 19th CIAO! Doctoral Consortium Workshop (2019)
 - 1st Workshop on Conceptual modeling, Ontologies and Metadata Management for FAIR Data (FAIR 2019)
 - 1st International Workshop of Ontology of Economics (WOE 2018);
 - 1st International Workshop on the Ontology of Social, Legal and Economic Entities (SoLEE 2019);
- I am one the founders of the OntoUML portal (<http://www.ontouml.org>) and I am currently serving as a member of its Editorial Board.

Publications

According to Google Scholar, I have a **citation count of 225**, an **h-index of 10**, and a **i10-index of 10**.

- **In peer-reviewed international academic journals:**
 - *T. P. Sales*, and G. Guizzardi (2015). “Ontological anti-patterns: Empirically Uncovered Error-prone Structures in Ontology-driven Conceptual Models”. *Data & Knowledge Engineering*, vol. 99, pp. 72-104. <https://doi.org/10.1016/j.datak.2015.06.004>
- **In peer-reviewed international conference:**
 - R.S.S. Guizzardi, A. Bravalheri, G. Guizzardi, *T.P. Sales*, D Simeonidou (2019). In: In: 37th International Conference on Conceptual Modeling (ER). Springer.
 - G. Amaral, *T.P. Sales*, G. Guizzardi, D. Porello (2019). “Towards a Reference Ontology of Trust”. In: 27th International Conference on Cooperative Information Systems (CoopIS). Springer.
 - *T.P. Sales* and G. Guizzardi (2019). “Ontological Anti-Patterns in Taxonomic Structures”. In: 12th Seminar on Ontology Research in Brazil (ONTOBRAS). CEUR-WS.org.
 - *T. P. Sales*, B. Roelens, G. Poels, G. Guizzardi, N. Guarino, and J. Mylopoulos (2019). “A Pattern Language for Value Modeling in ArchiMate”. In: 31st International Conference on Advanced Information Systems Engineering (CAiSE). vol. 11483. pp. 230–245. Springer. https://doi.org/10.1007/978-3-030-21290-2_15.
 - *T. P. Sales*, J. P. A. Almeida, S. Santini, F. Baião, and G. Guizzardi (2018). “Ontological Analysis and Redesign of Risk Modeling in ArchiMate”. In: 22nd IEEE International Enterprise Distributed Object Computing Conference (EDOC). pp. 154–163. IEEE. <https://doi.org/10.1109/edoc.2018.00028>
 - *T. P. Sales*, D. Porello, N. Guarino, G. Guizzardi, and J. Mylopoulos (2018). “Ontological Foundations of Competition”. In: 10th International Conference on Formal Ontology in Information Systems (FOIS). vol. 306. IOS Press, pp. 96–109. <http://doi.org/10.3233/978-1-61499-910-2-96>
 - *T. P. Sales*, F. Baião, G. Guizzardi, N. Guarino, and J. Mylopoulos (2018). “The Common Ontology of Value and Risk”. In: 37th International Conference on Conceptual Modeling (ER). vol. 11157. pp. 121–135. Springer. https://doi.org/10.1007/978-3-030-00847-5_11
 - G. Guizzardi, C. M. Fonseca, A. B. Benevides, J. P. A. Almeida, D. Porello, and *T. P. Sales* (2018). “Endurant Types in Ontology-Driven Conceptual Modeling: Towards OntoUML 2.0”. In: 37th International Conference on Conceptual Modeling (ER). vol. 11157. pp. 136–150, Springer. https://doi.org/10.1007/978-3-030-00847-5_12
 - N. Guarino, *T. P. Sales*, and G. Guizzardi (2018). “Reification and Truthmaking Patterns”. In: 37th International Conference on Conceptual Modeling (ER). vol. 11157, pp. 151–165. Springer. https://doi.org/10.1007/978-3-030-00847-5_13
 - *T. P. Sales*, N. Guarino, G. Guizzardi, and J. Mylopoulos (2017). “An Ontological Analysis of Value Propositions”. In: 21st IEEE International Enterprise Distributed Object Computing Conference (EDOC). pp. 184–193. IEEE. <https://doi.org/10.1109/edoc.2017.32>
 - *T. P. Sales* and G. Guizzardi (2017). ““Is It a Fleet or a Collection of

Ships?": Ontological Anti-patterns in the Modeling of Part-Whole Relations". In: 21st European Conference on Advances in Databases and Information Systems (ADBIS). vol. 10509, pp. 28–41. Springer https://doi.org/10.1007/978-3-319-66917-5_3

- M. I. Ferreira, J. L. R. Moreira, M. L. M. Campos, B. F. B. Braga, T. P. Sales, K. F. Cordeiro, and M. R. Borges (2015). "OntoEmergePlan: Variability of Emergency Plans Supported by a Domain Ontology". In: 12th International Conference on Information Systems for Crisis Response & Management (ISCRAM).
- G. Guizzardi, and T. P. Sales (2014). "Detection, Simulation and Elimination of Semantic Anti-patterns in Ontology-driven Conceptual Models". In: 33rd International Conference on Conceptual Modeling (ER). vol. 8824, pp. 363-376. Springer. https://doi.org/10.1007/978-3-319-12206-9_30
- R. Pergl, T. P. Sales, and Z. Rybala (2013). "Towards OntoUML for Software Engineering: From Domain Ontology to Implementation Model". In: 3rd International Conference on Model and Data Engineering (MEDI). vol. 8216, pp. 249-263. Springer. https://doi.org/10.1007/978-3-642-41366-7_21
- **In peer-reviewed international workshops:**
 - T. Derave, T.P. Sales, M. Verdonck, F. Gailly, and G. Poels (2019). "Domain Ontology for Digital Marketplaces". In: 7th International Workshop on Ontologies and Conceptual Modeling (OntoCom). Springer.
 - G. C. M. Amaral, G. Guizzardi, N. Guarino, D. Porello, T. P. Sales (2019). "Capability Agreements and Risk". In: 13th International Workshop on Value Modeling and Business Ontologies (VMBO). <https://vmbo2019.blogs.dsv.su.se/files/2019/02/AmaralEtAl.pdf>
 - M. Verdonck, T. P. Sales, and F. Gailly (2018). "A Comparative Illustration of Foundational Ontologies: BORO and UFO". In: 6th International Workshop on Ontologies and Conceptual Modeling (Onto.Com). vol. 2205. CEUR-WS.org http://ceur-ws.org/Vol-2205/paper24_ontocom1.pdf
 - T. P. Sales, N. Guarino, G. Guizzardi, and J. Mylopoulos (2018). "Towards an Ontology of Competition". In: 12th International Workshop on Value Modeling and Business Ontologies (VMBO). vol. 2239, pp. 64–73. CEUR-WS.org. http://ceur-ws.org/Vol-2239/article_6.pdf
 - N. Guarino, G. Guizzardi, and T. P. Sales (2018). "On the Ontological Nature of REA Core Relations". In: 12th International Workshop on Value Modeling and Business Ontologies (VMBO). vol. 2239, pp. 89–98. CEUR-WS.org. http://ceur-ws.org/Vol-2239/article_9.pdf
 - G. Guizzardi and T. P. Sales (2017). "“As Simple as Possible but not Simpler”: Towards an Ontology Model Canvas". In: 3rd Joint Ontology Workshops (JOWO). vol. 2050. CEUR-WS.org. <http://ceur-ws.org/Vol-2050/invited3-Guizzardi.pdf>
 - T. P. Sales, N. Guarino, G. Guizzardi, and J. Mylopoulos (2017). "Towards an Ontological Analysis of Value Propositions". In: 11th International Workshop on Value Modeling and Business Ontologies (VMBO).

- J. L. R. Moreira, *T. P. Sales*, J. Guerson, B. F. B. Braga, F. Brasileiro, and V. Sobral (2016). “Menthor Editor: An Ontology-Driven Conceptual Modeling Platform”. In: 2nd Joint Ontology Workshops (JOWO). vol. 1660. CEUR-WS.org <http://ceur-ws.org/Vol-1660/demo-paper1.pdf>
- J. Guerson, *T. P. Sales*, G. Guizzardi, and J. P. A. Almeida (2015) “OntoUML Lightweight Editor: A Model-based Environment to Build, Evaluate and Implement Reference Ontologies”. In: 19th IEEE International Enterprise Computing Conference Workshops (EDOCW). pp. 144–147. IEEE. <https://doi.org/10.1109/edocw.2015.17>
- R. Pergl, *T. P. Sales*, and Z. Rybala (2013). “Instance-Level Modelling and Simulation Revisited”. In: 9th International Workshop on Enterprise and Organizational Modeling and Simulation (EOMAS). vol. 153, pp. 85-100. Springer. https://doi.org/10.1007/978-3-642-41638-5_6
- *T. P. Sales*, P. P. F. Barcelos, G. Guizzardi (2012). “Identification of Semantic Anti-patterns in Ontology-driven Conceptual Modeling via Visual Simulation”. In: 4th International Workshop on Ontology-driven Information Systems Engineering (ODISE).
- **Book chapters:**
 - *T. P. Sales* and G. Guizzardi (2016). “Anti-patterns in Ontology-driven Conceptual Modeling: The Case of Role Modeling in OntoUML”. In: Ontology Engineering with Ontology Design Patterns: Foundations and Applications. Ed. by A. Gangemi, P. Hizler, K. Janowicz, A. Krisnadhi, and V. Presutti. Studies on the Semantic Web. Chap. 8, pp. 161–187. IOS Press. <https://doi.org/10.3233/978-1-61499-676-7-161>
- **Academic theses:**
 - *T. P. Sales* (2019). “Ontological Foundations for Strategic Business Modeling: The Case of Value, Risk and Competition”. Doctoral Thesis (Cum Laude), Department of Information Engineering and Computer Science, University of Trento, Italy. <http://eprints-phd.biblio.unitn.it/3578/>
 - *T. P. Sales* (2014). “Ontology Validation for Managers”. Master’s Thesis. Informatics Department, Federal University of Espírito Santo, Brazil. <http://repositorio.ufes.br/handle/10/4273>
 - *T. P. Sales* (2012). “Identificação de Padrões de Erro em Modelagem Conceitual por Meio de Validação de Ontologias OntoUML Utilizando Alloy” [Error Pattern Identification in Conceptual Modeling via the Validation of OntoUML Models using Alloy]. Informatics Department, Federal University of Espírito Santo, Brazil.

Awards

- Best Student Paper Award at the 21st IEEE International Conference on Enterprise Computing (EDOC 2017), Quebec, Canada, 2017 for the paper entitled “An Ontological Analysis of Value Propositions”.

Further data

- I have over 8 years of experience with ontology engineering in industrial projects, including designing, validating and implementing ontology-based systems.
- Co-author and developer of two open-source software tools: OntoUML Lightweight Editor (OLED) and Method Editor. Both tools supported

ontology-driven conceptual modeling using OntoUML and included features for model design, model validation and code generation. Their source codes are available at:

- **OLED:** <https://github.com/nemo-ufes/ontouml-lightweight-editor>.
- **Menthor Editor:** <https://github.com/MenthorTools/menthor-editor>

Entrepreneurship

- Research and industrial experience in using and extending foundational ontologies, in particular the Unified Foundational Ontology.
- In 2015, I co-founded Menthor, a private company dedicated to developing ontology-based solutions to aid companies in leveraging their data into value-adding services.
- After starting my PhD, I was accepted to the EIT Digital Doctoral School, a complementary program for PhD students that aims to develop business and entrepreneurial skills on researchers. This program is sponsored by EIT Digital, the leading European digital innovation and entrepreneurial education organization.

Language competence

- **Portuguese:** Mother Tongue
- **English:** Listening: C2, Reading: C2, Speaking: C2, Writing: C2
- **Italian:** Listening: B1, Reading: B1, Speaking: B1, Writing: B1

Driving license B

Date: 23/09/2019

Signature

