University Academic Curriculum Vitae

General Information

Personal information
Name: Eduardo Martins Guerra
E-Mail: eduardo.guerra@unibz.it

Education since leaving school
- 2002 – Bachelor in Computer Engineering (Instituto Tecnológico de Aeronáutica, ITA, Brasil)
- 2005 – Master Degree in Electronic and Computer Engineering – Area: Computer Science (Instituto Tecnológico de Aeronáutica, ITA, Brasil)
- 2011 – PhD in Electronic and Computer Engineering – Area: Computer Science (Instituto Tecnológico de Aeronáutica, ITA, Brasil)
- 2023 – Abilitazione Scientifica Nazionale alle funzioni di professore universitario di Seconda Fascia nel Settore Concorsuale 09/H1 - SISTEMI DI ELABORAZIONE DELLE INFORMAZIONI.
- 2023 – Abilitazione Scientifica Nazionale alle funzioni di professore universitario di Seconda Fascia nel Settore Concorsuale 01/B1 - INFORMATICA .

Present appointment
- Job title: Researcher (RTD)
- Since: 15-May-2023
- Free University of Bozen-Bolzano
- Develop research activities in software engineering. Teach courses for undergraduate and master's students. Supervise PhD, master, and bachelor thesis.

Professional experience

Chronological list of previous employments

Period	Job title	Institution	Academic level	Responsibilities
2020-2023	Researcher (RTD)	Free University of Bozen-Bolzano	PhD	Develop research activities in software engineering. Teach courses for undergraduate and master's students. Supervise PhD, master, and bachelor thesis.
2013-2020	Researcher	Instituto Nacional de Pesquisas Espaciais	PhD	Develop research in the field of software engineering in the context of space applications. Titular member of the Applied Computing Master/PhD program, teach courses and supervise master and PhD students, member of the board of the EMBRACE space weather program, participate in the institute software development projects.
2010 - 2013	Teacher (military rank: Captain)	Instituto Tecnológico de Aeronáutica	PhD	Teacher of undergraduate courses and graduate courses. Supervisor of undergraduate and graduate works. Coordinator of the Command-and-Control Laboratory.
2007 - 2010	Teacher (military rank:	Instituto Tecnológico de Aeronáutica	Master	Teacher of undergraduate courses and graduate scourses. Supervisor of

	Lieutenant)			undergraduate and graduate works.
2005 - 2007	Colaborator (military rank: Lieutenant)	Instituto Tecnológico de Aeronáutica	Master	Teacher of graduate courses.
2005-2007	Software Architect (military rank: Lieutenant)	Centro de Computação da Aeronáutica de São José dos Campos	Master	Software architect; Software engineer.
2003-2005	Software Developer (military rank: Lieutenant)	Centro de Computação da Aeronáutica de São José dos Campos	Graduated	Software developer.

Language competence

- Portuguese: native
- English: C1 (Free University of Bozen-Bolzano exam)
- Italian: C1 (Free University of Bozen-Bolzano exam)
- German: B1 (Free University of Bozen-Bolzano exam)
- Spanish: A2 (no certification)

Personal References

- Xiaofeng Wang
  Free University of Bozen-Bolzano, UniBZ
  Xiaofeng.Wang@unibz.it / +39 377 450 4574
- Clovis Torres Fernandes
  Instituto Tecnológico de Aeronáutica (retired)
  clovistf@uol.com.br / +55 12 98125 2507
- Alfredo Goldman
  Universidade de São Paulo
  gold@ime.usp.br / +55 11 98239 0407
- Paulo Roberto Miranda Meirelles
  Universidade Federal do ABC
  paulo.meirelles@ufabc.edu.br / +55 11 96496-9184
- Ademar Manuel Teixeira de Aguiar
  Faculdade de Engenharia da Universidade do Porto (FEUP)
  ademar.aguiar@fe.up.pt / +351 933 408 063
- Reinando Rosa
  Instituto Nacional de Pesquisas Espaciais
  reinaldo.rosa@inpe.br / +55 12 98129-8988

Driving license   Type AB (Italian)

Teaching Highlights	• In the last five years in Unibz, have 8.7 (in 10.0) as a professor score and 95% of positive responses, based on students' evaluation. • More than 20 years of experience (started in 2004) in superior education for courses in the field of computer science, teaching for bachelor students in one of the best engineering schools in Brazil (Instituto Tecnológico de Aeronáutica - ITA) and for master and Ph.D. students in one of the most recognized research institutes from Brazil (National Institute of Space Research - INPE). • Use innovative teaching methods, including gamification, coding dojos, design challenges, and educational games, to create an engaging and stimulating environment for students. • Developed online courses in the Coursera platform in partnership with Instituto Tecnológico de Aeronáutica, which were pioneers as courses in Portuguese from Brazilian institutes for the Coursera platform and have a higher evaluation from the students of the platform. • During the period as a teacher in Instituto Tecnológico de Aeronáutica (2007-2013), he was chosen as the "honored teacher" by the students of the Computer Engineering course (2009, 2010, 2011) and by the students of the Software Engineering specialization program (2009).
Research Highlights	• Good record and regularity of publications both in top-ranked conferences and journals, and, even having significant research contributions in under-researched field, has a current H-index is 12 in Scopus and 19 in Google Scholar. • Has research independence, having important publications both as the leading author and in collaborations with different research groups. • Supervised 6 concluded PhDs and currently participate in the supervision of 1 PhD student in Unibz and 3 PhD students in other institutions as an external supervisor. • Strong participation in the community in conference organization (examples: program chair in EuroPLoP 2026, XP 2024, PLoP 2022, ACM SAC Cloud Continuum Track Chair 2025-2026) and as an invited keynote (examples: XP 2026 and PLoP 2023) • Receive an award for the academic activity in 2024 and 2025 from Free University of Bozen-Bolzano.
Third Mission Highlights	• Offered the Board Game Design course in Studium Generale as an 18h course in 2022 and 2023, and with 36h in 2024 and 2025. The course is popular among students from diverse courses and levels and had more than 50 enrolments in the last edition. • Is the host of the Hillside PatternCast, a podcast of scientific dissemination focused on the field of patterns and pattern languages which has monthly episodes with the participation of different guests, since May 2024. • Engaged in the local software development community, already participating as a speaker several times in events like SFSCon, Open Data Hub Day, and Developer's Thursday. Since 2024, joined as an organizer of the Open Data Hub Bootcamp. • Manage and participate in several open-source projects of frameworks and software engineering tools. These projects use best practices for coding and testing, several being mature enough to be adopted in industrial and production environments. • Participated in important projects and programs with companies and public institutions Highlights: for the Brazilian government while in INPE, was a member of the council of the Brazilian Space Weather Program called EMBRACE; in unibz participated on the EDIH project from the Digital Innovation Hub South Tyrol (DIS-HUB) working with 4 companies and offering a course on Agentic AI.

Table of Content

Teaching

Teaching Statement

My first experience teaching was in 1999 in a chemistry course for underprivileged students to do the exam to enroll in universities in Brazil. I started using unconventional resources with these students to make the classes more interesting. One example was using a mirror and small balls with wooden sticks to show optical isomers in organic molecules. But it was in 2004 that I started teaching undergraduate students in Computer Science. The creativity also took place in these classes, where I used games and outdoor activities as didactic resources. The ordering championship in which the students should order themselves using different algorithms became famous among the students.

Since then, I have accumulated extensive teaching experience, mainly in programming, software design, and software architecture courses. I had the opportunity to teach at one of the best engineering schools in Brazil, the Instituto Tecnológico de Aeronáutica (ITA), where I supervised many undergraduate and graduate conclusion works. From 2013 to 2019, acting as a researcher in the Instituto Nacional de Pesquisas Espaciais (INPE), I focused my teaching on advanced courses for Master's and PhD students. Finally, from 2020 until today, in my current position, I acted on courses for Bachelor and Master students in online, hybrid, and face-to-face editions. Last year, I also started teaching at Unibz, an interdisciplinary course related to one of my passions: Board Game Design.

In the graduate and undergraduate programs where I participate, I actively propose new courses: (a) at Unibz proposed the Advanced Software Design Techniques at the Master course for Software; (b) at Unibz proposed the Board Game Design course in Studium Generale; (c) at Unibz proposed Software as a Research Contribution in the Computer Science PhD; (d) at Instituto Nacional de Pesquisas Espaciais proposed the courses Agile Software Design, Framework Development, and Design Patterns to the Applied Computing master and PhD program; (e) at Instituto Tecnológico de Aeronáutica proposed the course Software Engineering Fundamentals as mandatory course and Advanced Topics on Object-Orientation as an optional course for the Computer Engineering bachelor.

I also had the opportunity to work on one of the first online courses released by the Coursera platform in Portuguese in partnership with a Brazilian institute. All five courses I was involved in remain available online and had an excellent evaluation from the students. In the last years, I used all this experience with online classes in Unibz to face challenges related to the COVID restrictions.

By teaching courses related to programming and technology for several years, I learned how to balance the teaching of core principles and best practices of software design with the introduction of new technologies and trends. I currently design my courses to have a fixed path involving the main concepts related to the subject, but also considering a variable content that covers how these concepts are used in practice by local companies, presented in recent research studies, and applied in novel frameworks and platforms. That is done through optional activities that can be chosen and performed along the course.

These optional activities are managed through a gamified scheme, where the students should perform activities to get points. The diversity of activities offered allows the students to choose a path to explore the course concepts in the direction of their personal interests and profile. Examples of types of activities are: [a] research (presentation of tools, frameworks, or research papers); [b] judgments (two students presenting benefits and drawbacks of a given technology or practice); [c] quests (talking to professionals or visiting local companies to understand how things are done in practice); and [d] hands-on (implementing and

presenting code created using a tool or technique).

In the last years, my courses had also a strong connection with the local industry through a partnership with the Open Data Hub. The students work in projects and challenges in which they need to interact with real data provided by the platform services. The presentation are in public events, like Open Data Hub Day and Developers Thursday, where the students have the opportunity to have interesting discussions with professionals.

Besides all these practices, I also try to adopt more engaging didactic approaches and formats in the frontal lectures, like using real-world examples, proposing challenging hands-on exercises, developing collaborative solutions using coding dojos, conducting didactic games, and stimulating participation in classroom debates. A coding dojo is an activity where all students in the class work cooperatively to implement code that fulfills a given number of requirements. While a pair of students develop the code in front of the class, the other students can provide suggestions. The control of the keyboard alternates every 5 minutes, giving a chance to all of them to participate. About didactic games, I highlight one developed by me and a student called Software Architecture Sherlock. In this game, the students investigate problems and explore software architectures in a hybrid analogic-digital game using cards with QR codes and an app employing mechanics from modern investigative board games.

Considering the goal of developing my career in a university in Italy and having Portuguese as my native language, in my last years at Unibz, I also invested much effort in learning Italian and German. At the beginning of 2023, I passed the Italian C1 level exam, and in 2024 I passed the German B1 level. This knowledge was already put into practice in my current position in the interaction with students, university staff, and local companies. Today, I feel ready to teach courses at the university, not only in English but also in the Italian language. Additionally, I continue to study German, completing the B2 courses and I am currently preparing for the B2 exam.

My background allowed me to develop advanced programming skills and a strong knowledge of software design. I am passionate about passing this knowledge to students, and I am continuously searching for engaging and creative ways to stimulate the students in this learning path.

Experience in academic teaching	Teaching at Free University of Bozen-Bolzano (2023-2020) – *with a description of the didactic approaches adopted. Evaluation of the didactic activities in Appendix I.*

- "Software as a Research Contribution": course for the PhD in Computer Science; Free University of Bozen-Bolzano; 30 hours (responsible for 15 hours); 2 instances (2024/2025, 2025/2026) - *The goal of this course is to present how the software produced as part of PhD research projects can also be a relevant research contribution. The first edition of the course had several enrollments from different faculties and was finished by 17 PhD students.*

- "Software Architecture": Master course for Software Egineering; Free University of Bozen-Bolzano; 60 hours; 1 instance (2025/2026) – *This course was moved from the bachelor's in computer science ("Software Systems Architecture") and adapted from the Master level. While all the didactic strategies from the bachelor course were kept (described further), a highlight in this edition was the introduction of a topic related to the architecture of AI Agents, covering a recent subject that presents to the students a knowledge that is current being pursued by a large number of*

companies in industry.

- "Software Systems Architecture": undergraduate course for Bachelor Computer Science; Free University of Bozen-Bolzano; 60 hours; 6 instances (from 2019/2020 to 2024/2025) – *This course was taught online (2019/2020), in hybrid mode (2020/2021, 2021/2022), and in presence in the following years. It adopted an approach where the classes presented fundamental concepts in software architecture, and the students actively learned by making presentations where they showed recent applications and technologies related to those concepts. The inceptive to participate in the presentations was done using an innovative gamified approach that evolved and was adapted through the course instances. Besides theory classes and presentations, the course also used games and hands-on sessions based on coding dojos. In the last years, the students developed projects with real data in the context of the Open Data Hub and present in public events.*

- "Advanced Software Design Techniques": Master course for Software Egineering; Free University of Bozen-Bolzano; 60 hours; 4 instances (from 2021/2022 to 2024/2025) – *This course was a proposed restructure of the course "Requirements and Design of Dependable Systems" taught in the previous year. Besides adopting a similar didactic approach to "Software Systems Architecture," the innovation was also in the content. The course focused on contemporary design techniques like TDD (Test-Driven Development), refactoring, framework design, and pattern combinations. The labs focused on hands-on software design problems based on real industry requirements. In the last edition, the students worked on challenges in the context of the Open Data Hub and presented their works in a public event.*

- "Board Game Design": Studium Generale; Free University of Bolzano; 4 instances (18h in 2021/2022, 2022/2023, 36h in 2023/2024, 2024/2025) – *This course was proposed to Studium Generale as a new course that presents game mechanics and the development process for board games. The material was created from scratch and used personal experience and the (scarce) current literature. As the final work, the students presented games designed by them, reaching excellent results. In all editions of the course, the course received a high number of enrollments, and it was attended by students from several faculties It was published online articles about this course:*

  https://www.salto.bz/it/article/27092022/studying-board-games.
  https://www.unibzmagazine.it/en/magazine/article/dalle-aule-di-ingegneria-a-lucca-comics-per-parlare-di-game-design

- "Requirements and Design of Dependable Systems": Master course for Software Engineering for Information Systems; Free University of Bozen-Bolzano; 40 hours (only theory); 1 instance (2020/2021) – *This course's main challenge was adapting the activities to a hybrid audience. Having half of the students online and the other half in presence, it was needed to stimulate and propose actions that inceptive the interactions among the students. It also adopted gamification and hands-on activities as*

described in the previous courses.

- "Systems Engineering": undergraduate course for Bachelor Computer Science; Free University of Bozen-Bolzano; 20 hours (only lab); 1 instance (2020/2021) – *The ten weeks of the course were structured to simulate the development of real software delivered in four iterations. Each week, a new technique was introduced and should be adopted by the students. Some instances of techniques that were learned: User Stories, Shared Ownership, Planning Poker, Automated Testing, Continuous Integration, Retrospectives, and Continuous Inspection. This structure of the lab part of the course, introducing techniques and requiring evidence of their usage throughout the course, was innovative and received good feedback from the students.*

Teaching at Instituto Nacional de Pesquisas Espaciais (2013-2019):

- "Agile Software Design" (original "Projeto de Software Ágil"): graduate course for master and PhD students; Instituto Nacional de Pesquisas Espaciais; Applied Computing Master and PhD program; 40 hours; 6 instances (2013, 2014, 2015, 2016, 2017, 2018).
- "Framework Development" (original "Desenvolvimento de Frameworks"): graduate course for master and PhD students; Instituto Nacional de Pesquisas Espaciais; Applied Computing Master and PhD program; 40 hours; 5 instances (2014, 2016, 2017, 2018, 2019).
- "Design Patterns" (original "Padrões de Projeto"): graduate course for master and PhD students; Instituto Nacional de Pesquisas Espaciais; Applied Computing Master and PhD program; 40 hours; 4 instances (2016, 2017, 2018, 2019).

Online Courses for the Coursera Platform developed in partnership with Instituto Tecnológico de Aeronáutica (recorded from 2015 to 2017) - *number of subscribers and user rating data provided by the Coursera platform*:

- "Object-oriented Programming in Java" (original "Orientação a Objetos em Java"): on-line course in the Coursera platform; Instituto Tecnológico de Aeronáutica; launched on 26-feb-2016; 40655 subscribers; rating 4.8/5.0 (data from 31-jul-2019).
- "TDD – Test-driven Development" (original "TDD – Desenvolvimento Guiado por Testes"): on-line course in the Coursera platform; Instituto Tecnológico de Aeronáutica; launched on 23-may-2016; 10699 subscribers; rating 4.5/5.0 (data from 31-jul-2019).
- Agile Development With Advanced Java (original "Desenvolvimento Ágil com Java Avançado"): on-line course in the Coursera platform; Instituto Tecnológico de Aeronáutica; launched on 29-aug-2016; 8357 subscribers; rating 4.7/5.0 (data from 31-jul-2019).
- "Principles of Agile Software Development" (original "Princípios de Desenvolvimento Ágil de Software"): on-line course in the Coursera platform; Instituto Tecnológico de Aeronáutica; launched on 05-dez-2016; 10605 subscribers; rating 4.7/5.0 (data

from 31-jul-2019).

- "Agile Development with Design Patterns" (original "Desenvolvimento Ágil com Padrões de Projeto"): on-line course in the Coursera platform; Instituto Tecnológico de Aeronáutica; launched on 04-set-2017; 6337 subscribers; rating 4.7/5.0 (data from 31-jul-2019).

Didactic approach and results from these online courses are presented in the technical report "Recommended Guidelines for Effective MOOCs based on a Multiple-Case Study" - https://arxiv.org/abs/2204.03405

Teaching at undergraduate engineering courses in Instituto Tecnológico de Aeronáutica (2007-2012):

- "Object-oriented Programming" (original "Programação Orientada a Objetos") undergraduate course for the third year of the bachelor course of Computer Engineering; Instituto Tecnológico de Aeronáutica; 96 hours; 1 instance (2012)
- "Software Engineering Fundamentals" (original "Fundamentos de Engenharia de Software") undergraduate course for the third year of the bachelor course of Computer Engineering; Instituto Tecnológico de Aeronáutica; 80 hours; 2 instances (2011, 2012)
- "Advanced Topics in Object-Orientation" (original "Tópicos Avançados em Orientação a Objetos") optional undergraduate course for the last year of the bachelor course of Computer Engineering; 64 hours; 2 instances (2008, 2009)
- "Introduction to Computer Science" (original "Introdução a Computação") undergraduate course for the first year for all engineering bachelor courses; Instituto Tecnológico de Aeronáutica; 96 hours; 5 instances (2008, 2009 for two classes, 2010, 2011)
- "Database Techniques" (original "Técnicas de Banco de Dados") undergraduate course for the third year of the bachelor course of Computer Engineering; Instituto Tecnológico de Aeronáutica; 80 hours; 4 instances (2007, 2008, 2009, 2010)

Teaching at graduate "lato-sensu" specialization courses in Instituto Tecnológico de Aeronáutica (2004-2012):

Note: In Brazil, "lato-sensu" specialization courses refers to graduate courses that target professionals that want to expand their knowledge and specialize in a given field. MBA would be an example of a "lato-sensu" specialization course. These specialization programs should have a minimum of 360 hours.

- "Design Patterns and Frameworks" (original "Padrões de Projeto e Frameworks") graduate specialization course in Software Engineering; Instituto Tecnológico de Aeronáutica; 32 hours; 2 instances (2010 for 2 classes)
- "Identification, Authentication and Authorization Systems" (original "Sistemas de Identificação, Autenticação e Autorização") graduate specialization course in Information Security; Instituto Tecnológico de Aeronáutica; 32 hours; 9 instances (2006 for 2 classes, 2007 for 2 classes, 2008 for 2 classes, 2009, 2010 for 2

classes)

- "Complementary Topics in Software Engineering" (original "Tópicos Complementares em Engenharia de Software") graduate specialization course in Software Engineering; Instituto Tecnológico de Aeronáutica; 32 hours; 9 instances (2006 for 2 classes, 2007 for 2 classes, 2008 for 2 classes, 2009 for 2 classes, 2010)
- "J2EE Distributed Programming" (original "Programação Distribuída com J2EE") graduate specialization course in Software Engineering; Instituto Tecnológico de Aeronáutica; 32 hours; 10 instances (2003, 2006 for 2 classes, 2007 for 3 classes, 2008 for 2 classes, 2009 for 2 classes)
- "Object-oriented Programming" (original "Programação Orientada a Objetos") graduate specialization course in Systems Analysis; Instituto Tecnológico de Aeronáutica; 48 hours; 1 instance (2004)
- "Computer Programming Fundamentals" (original "Fundamentos de Programação de Computadores") graduate specialization course in Systems Analysis; Instituto Tecnológico de Aeronáutica; 32 hours; 1 instance (2004)

Teaching at undergraduate Computer Science course in Universidade Paulista - UNIP (2004):

- "Programming Paradigms I and II" (original "Paradigmas de Programação I e II") undergraduate course of Computer Science; Universidade Paulista; 1 instance (2004)
- "Computer Graphics I and II" (original "Computação Gráfica I e II") undergraduate course of Computer Science; Universidade Paulista; 1 instance (2004)
- "Programming Languages" (original "Linguagens de Programação") undergraduate course of Computer Science; Universidade Paulista; 1 instance (2004)

Visiting Professor
- Universidade Federal Rural do Semi-Árido, Mossoró, Brazil September 2025. Funded by the Brazilian Federal Foundation for Support and Evaluation of Graduate Education – CAPES.

Undergraduate Supervisions

Undergraduate Supervisions at Free University of Bozen-Bolzano:

- Sofia Aspromonte. "Gioca con me: Una collezione Il design dei giochi da tavolo applicato nell'assistenza sociale per i pazienti affetti da Alzheimer, demenze e demenza senile.", 2025, Bachelor's Degree in Design and Art - Major in Design, Free University of Bozen-Bolzano, co-supervised by Marcello Barison.
- Maximilian Penduzzu. "A code augmentation approach for displaying implicit method characteristics using impermanent identifiers", 2024. Bachelor's Degree in Computer Science, Free University of Bozen-Bolzano.
- Balawal Sultan. "Website Carbon Emissions: How are they estimated? How can we mitigate them? Can users lower them?", 2024. Bachelor's Degree in Computer Science, Free University of Bozen-Bolzano.
- Alessandro Gottardi. "An analysis of the impact of domain debt in open-source projects", 2023. Bachelor's Degree in Computer Science, Free University of Bozen-Bolzano.

- Samuel Dalvai. "Extending Esfinge Query Builder Framework to Support Apache Cassandra", 2022. Bachelor's Degree in Computer Science, Free University of Bozen-Bolzano.
- Simon Gschnell. "An Educational Game with Digital and Analogic Elements for Teaching Software Architecture", 2022. Bachelor's Degree in Computer Science, Free University of Bozen-Bolzano.
- Shahraz Nasir. "Non-functional Requirements Management in Agile Teams - A study with South Tyrolean companies", 2022. Bachelor's Degree in Informatics and Management of Digital Business, Free University of Bozen-Bolzano.
- Davide Filippi. "A Web Tool to Manage a Lightweight Software Analytics Process", 2022. Bachelor's Degree in Computer Science, Free University of Bozen-Bolzano.

Other undergraduate supervisions:

- Thiago Guerrero Balera. "Improving modifiability in microservices architectures - A reference implementation for a remote work platform in software startups", 2023. Bachelor's Degree in Computer Science, University of São Paulo.
- João Francisco Lino Daniel and Leonardo Lana Violin Oliveira. "Byron - an Event-Driven Microservices Framework", 2019. Bachelor's Degree in Computer Science, University of São Paulo.
- Bruno de Souza Bonagura. "Refactoring of Neutrino to Use Resources of the Eclipse Language Toolkit" (original "Refatoração do Neutrino Para Uso Dos Recursos Do Language Toolkit do Eclipse"). 2013. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Allan Machado da Silva. "Extension of Esfinge QueryBuilder framework for NoSQL databases" (original "Extensão do framework Esfinge QueryBuilder para bancos de dados NoSQL"), 2012. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Gustavo Schmidt Joau e Silva. "Refactoring plugin of Esfinge QueryBuilder framework for Eclipse IDE" (original "Plugin de refatoração do framework Esfinge QueryBuilder para o Eclipse IDE"), 2012. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Vinícius Canaã Medeiros Ruela. "Compile-time verifications for name convetions used by Esfinge QueryBuilder framework" (original "Verificações em tempo de compilação de convenções de nomenclatura de métodos utilizados pelo framework Esfinge QueryBuilder"), 2012. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Igor de Souza Almeida. "Automatic Detection of Bad Smells and Evaluation of Metrics Threshold Values on Annotated Codes", 2011. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Bruno Picinin Cardoso. "Android Framework based on Metadata" (original "Framework para Android Baseado em Metadados"), 2011. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Rodrigo Simões de Almeida. "Bad smells detection in test code" (original "Detecção de maus cheiros em código de testes"), 2011.

Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.

- Leonardo Ribeiro de Castro Carvalho. "Frameworks based on metadata and reflection for JavaME" (original "Frameworks baseados em metadados e reflection em JavaME"), 2011. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Arthur Pereira Duarte. "Tool for refactoring XML documents" (original "Ferramenta para refatoração de documentos XML"), 2010. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Diego Alvarez Araujo Correia. "Metrics definition, automatic detection of bad smells and refactoring on annotated codes", 2010. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Felipe Corrêa de Moraes. "A tool to use reflection in mobile apps in JavaME" (original "Uma ferramenta para uso de reflexão em aplicativos móveis JavaME"), 2010. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Rafael Prudente Mamare. "Web application for managing database refactorings in agile software development" (original, "Aplicação web de gerenciamento de refatorações de bancos de dados para desenvolvimento ágil"), 2009. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Kely Marques Rosa. "Definition of na architecture for storing files generated by Shamir algorithm" (original "Definição de uma arquitetura para armazenamento dos arquivos gerados pelo algoritmo de compartilhamento de segredo de Shamir"), 2009. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Douglas Ribeiro and Emil Yoshigae Nakao. "Comparative study on the approach for metadata definition in frameworks" (original, "Estudo comparativo de formas de definição de metadados para frameworks"), 2009. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Júlio César Moura de Oliveira. "Flexibilization in the usage of metadata by SwingBean framework" (original "Flexibilização do uso de metadados no framework Swingbean"), 2009. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Luciano Severo Bittencourt. "Architectural model for cooperative edition of reports in Command and Control applications" (original "Modelo arquitetural para edição cooperativa de diretrizes e relatórios restruturados em aplicativos de comando e controle"), 2009. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Guilherme Rodrigues Salerno and Marcela Sobrinho Pereira. "Refactoring model for XML documents" (original "Um modelo de refatoração em documentos XML"), 2009. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Renzo dos Santos Nuccitelli. "Event handling in Java using metadata" (original "Tratamento de Eventos em Java com Uso de Metadados"), 2008. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Menanes Chaves Barros Cardoso. "Analysis, Identification, and

Documentation of Annotations Patterns" (original "Análise, Identificação e Documentação de Padrões de Anotação"), 2008. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.

- Luiz Fernando Dalcico. "Web application for managing several database platforms" (original "Aplicativo Web para administração de diversas plataformas de bancos de dados"), 2008. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Marcio Araujo Varchavsky. "Access Control Solution for the Integration of Command and Control Applications" (original "Solução em Controle de Acesso para Integração de Aplicativos de Comando e Controle"), 2007. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.
- Ednelson Silva de Oliveira. "Study of the JXTA platform for Command and Control Applications" (original "Estudo da plataforma JXTA para uso em aplicações de comando e controle"), 2004. Bachelor's Degree in Computer Engineering, Instituto Tecnológico de Aeronáutica.

Graduate Supervisions

Master and specialization courses

Supervisions in Master courses:

- Matteo Gozzi. A Study about Representing Version Control Information through Emojis based on Code Augmentation, 2025. Master in Software Engineering. Free University of Bozen-Bolzano.
- Igor dos Santos Moreira. Analysis of practices and challenges for documenting non-functional requirements from the perspective of agile software development. (original "Análise de práticas e desafios para documentação de requisitos não funcionais na perspectiva do desenvolvimento ágil de software"), 2025. Master in Applied Computing - IPT - Instituto de Pesquisas Tecnológicas do Estado de SP.
- Iury Henrique de Oliveira. Developers Perspectives on GitHub Copilot: Unveiling Pain Points through Experience-Based Adoption, 2025. Master in Applied Computing - IPT - Instituto de Pesquisas Tecnológicas do Estado de SP.
- André Paris. Handling Architectural Uncertainties Through Patterns for Minor Adjustments in the Development Process, 2025. Master in Applied Computing - IPT - Instituto de Pesquisas Tecnológicas do Estado de SP.
- Michele Berlanda. Using Code Augmentation to Show Usage of Vulnerable Libraries, 2024. Master in Software Engineering for Information Systems. Free University of Bozen-Bolzano.
- Marcelo Vidu Vendite de Almeida, Detecting Architectural "Bad Smells" in Microservices: A Metrics-Based Approach (original, "Detecção de "Bad Smells" arquiteturais em microsserviços: Uma abordagem baseada em métricas"), 2024. Master in Applied Computing - IPT - Instituto de Pesquisas Tecnológicas do Estado de SP.
- Tiago Samuel Rodrigues Teixeira, Mutation testing-based tool for verifying the maintainability of test code behavior after refactoring. (original, "Ferramenta baseada em teste de mutação para verificação da manutenção do comportamento do código de teste

após a refatoração"), 2024. Master in Applied Computing - IPT - Instituto de Pesquisas Tecnológicas do Estado de SP.

- João José Maranhão Junior, A prompt patterns sequence aproach to apply generative AI in assisting software architecture Evaluation of the decision-making, 2024. Master in Applied Computing - IPT - Instituto de Pesquisas Tecnológicas do Estado de SP.
- Hosna Hooshyar, Quantitative evaluation of responses to a survey regarding the impact of COVID-19 restrictions on software engineering activities. 2024. Master Degree in Computational Data Science, Free University of Bozen-Bolzano.
- Matheus Chaves Leite, An empirical study of the microservices cataloging tool impact in a large software development unit, 2024. Master in Applied Computing - IPT - Instituto de Pesquisas Tecnológicas do Estado de SP.
- Marcelo Augusto da Silva, A study on differences between the perspectives of business and architecture area regarding software systems in an agile context (original, "Um estudo sobre disparidades de visões entre área de negócio e arquitetura acerca de sistemas de software em um contexto ágil"), 2024. Professional Master's Degree in Mission Critical Computing, Instituto Tecnológico de Aeronáutica, co-supervised with Prof. Dr. Inaldo Capistrano Costa.
- Bruno Meira Tenório D'Albuquerque. A Development Team-Centric Approach to Analyzing the Modularity of Monolithic Applications. 2024. Professional Master's Degree in Mission Critical Computing, Instituto Tecnológico de Aeronáutica, co-supervised with Prof. Dr. Inaldo Capistrano Costa.
- Jana Karas. The Impact of Natural Language Processing on Business Process Design. 2023. European Master in Software Engineering, double degree with Universidad Politécnica de Madrid and Free University of Bozen-Bolzano, co-supervised with Jose Antonio Calvo-Manzano Villalón.
- Wagner Santos de Souza. A Framework Model for Decoupling A/B Test Experiment Implementations at Class and Component Level. 2023. Master in Applied Computing - IPT - Instituto de Pesquisas Tecnológicas do Estado de SP.
- Luiz Viviani. Anti-patterns related to uncertainty in non-functional requirements. 2023. Master in Applied Computing - IPT - Instituto de Pesquisas Tecnológicas do Estado de SP, co-supervised with Jorge Melegati.
- João Francisco Lino Daniel. Automatic detection of Patterns in Microservices-based Architectures. 2022. Master in Computer Science - Instituto de Matemática e Estatística – University of São Paulo, co-supervised with Alfredo Goldman
- Duarte Filipe Machado de Oliveira. "Continuous assessing of code quality through software analytics in a start-up environment", 2021. Integrated Master in Computer Engineering, Engineering Faculty from the University of Porto, co-supervised with Filipe Correia.
- Guilherme Vale Martins. "Designing Microservice Systems Using Patterns: An Empirical Study On Architectural Trade-offs", 2021. Integrated Master in Computer Engineering, Engineering Faculty from the University of Porto, co-supervised with Filipe Correia.
- João Pedro Bandeira Fidalgo. "Metrics-based evaluation and

improvement of source code design", 2021. Integrated Master in Computer Engineering, Engineering Faculty from the University of Porto, co-supervised with Filipe Correia.

- Antonio de Oliveira Dias. "Architecture for Using Reflexive Frameworks in the Behavioral Parts of Adaptive Object Models" (original "Uma Arquitetura para Utilização de Frameworks Reflexivos na Parte Comportamental de Modelos de Objetos Adaptativos"), 2019. Master Thesis in Applied Computing, Instituto Nacional de Pesquisas Espaciais.
- Eduardo Pereira de Sousa. "Comparative Analysis of Logic Coupling for Web Framework Components" (original "Análise Comparativa do Acoplamento Lógico entre Componentes de Frameworks Web"), 2018. Master Thesis in Applied Computing, Instituto Nacional de Pesquisas Espaciais.
- David França. "Architectural Model for Managing Versions of Web Service Contracts" (original "Modelo Arquitetural para Gerenciamento de Versões de Contratos de Serviços Web"), 2017. Master Thesis in Applied Computing, Instituto Nacional de Pesquisas Espaciais.
- Diego Benincasa. "Evaluation of Web Services Contracts and their Variability During Project's Life Cycle", 2015. Master Thesis in Applied Computing - Instituto Nacional de Pesquisas Espaciais.
- Carlos Rafael Gimenes das Neves. "JavaAsync – Java Language Extension for Handling Asynchronous Events" (original "JavaAsync - Extensão da Linguagem Java para Tratamento de Eventos Assíncronos"), 2013. Master Thesis in Electronic and Computer Engineering - Instituto Tecnológico de Aeronáutica, co-supervised with Clovis Torres Fernandes.
- Jefferson Silva. "An Architectural Model for Access Control Frameworks Extensible for Different Authorization Models", 2013. Master Thesis in Electronic and Computer Engineering, Instituto Tecnológico de Aeronáutica, co-supervised with Clovis Torres Fernandes.

Supervisions at graduate "lato-sensu" specialization course of Software Engineering in Instituto Tecnológico de Aeronáutica:

Note: In Brazil, "lato-sensu" specialization courses refers to graduate courses that target professionals that want to expand their knowledge and specialize in a given field. MBA would be an example of a "lato-sensu" specialization course. These specialization programs should have a minimum of 360 hours.

- Luiz Felipe Miranda de Oliveira. "Annotation Library for RMI Distributed Systems Test" (original "Biblioteca de Anotações para Teste de Sistemas Distribuídos que Utilizam RMI"), 2012. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Leandro Resende de Pádua. "A probabilistic approach for release prioritization techniques used in agile methods" (original "Uma Abordagem Probabilística para Técnicas de Priorização de Releases de Software Utilizadas em Metodologias Ágeis"), 2012. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Eduardo Sérgio e Silva Buarque. "SystemGlue – A framework to

manage application integration in distict scenarios" (original "SystemGlue - Framework para Gerenciamento da Integração de Aplicações em Cenários Distintos"), 2012. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Bruno Rodrigues Demboscki. "Neutrino: a test code refactoring tool" (original "Neutrino: Uma Ferramenta de Refatoração de Código de Teste"), 2012. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Patricia Megumi Matsumoto. "An Architectural Model for Adapting Domain-Specific AOM Applications", 2012. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Lucas Scheid and Ricardo de Araujo Santos. "Persistence Component JDBC to Integrate with Esfinge QueryBuilder framework" (original "Componente de Persistência de Dados JDBC para Integração com o Framework Esfinge QueryBuilder"), 2012. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Mauricio Matsuda. "TeamsPolicy – A tool using domain annotations to create role restrictions" (original "TeamsPolicy - Uma Ferramenta para Criar Restrições de Papéis Usando Anotações de Dominio"), 2011. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Alessandro Alba. "Readability analysis of code annotations using annotation patterns" (original "Análise de Legibilidade de Código Usando Padrões de Anotações"), 2011. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Rafael Monico Azevedo. "A tool model for test code refactoring" (original "Um Modelo para Ferramentas de Automação de Refatoração de Código de Teste"), 2011. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Marcus Vinicius Costa Floriano and Debora Alves Lima Chama. "An automated test framework to create annotations to validate and initialize external elements" (original "Framework para Construir Anotações de Validação e Inicialização de Fatores Externos em Testes Automatizados"), 2011. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Flávia Cristina De Marco. "Architectural refactoring for workflow adoption" (original "Refatoração de Arquitetura para Adoção de Workflows"), 2011. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Herbert de Oliveira Vieira and Jolienai Ribeiro Viégas. "Extension of JavaDoc to include test code in the class documentation" (original "Extensão do JavaDoc para Inclusão de Código de Testes na Documentação das Classes"), 2010. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- Paulo Henrique Ferreira Costa and Pedro Abs. "JSIN: Tool based on metadata for detecting code vulnerabilities through static analysis" (original "JSIN: Ferramenta baseada em metadados para analise estática de códigos para detecção de

vulnerabilidades"), 2010. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.

- José Roberto Campos Perillo. "Daileon: a tool to enable the usage of domain annotations" (original "Daileon: Uma ferramenta para habilitar o uso de anotações de domínio"), 2010. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica..
- Carlos Farro, Davyd Santos, Felipe Firmo and Leandro Jacomelli. "A model for interface reuse based on domain class metadata" (original "Um Modelo para Reúso de Interface Baseados em Metadados de Classes de Domínio"), 2009. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Marcos Wada and Salomão Batista Rodrigues Junior. "A comparative study on the tools to support metadata-based frameworks usage" (original "Estudo Comparativo de Ferramentas de Apoio ao Uso de Frameworks Baseados em Metadados"), 2009. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Gustavo Maimone Hispagnol. "A multidimentional unified model to integrate OLAP and OLTP domains" (original "Modelo Multidimensional Unificado: Integrando Domínios OLAP e OLTP"), 2009. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Fábio José Marcelino Rosalém and Rodrigo Ferreira. "A study about the correction of defects in the definition and configuration of mock objects in unit tests" (original "Um Estudo da Correção de Defeitos em Definições e Configurações de Mock Objects em Testes de Unidade"), 2009. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Jorge Augusto Oliveira da Silva and Ricardo Rikio Costa Okura. "A model for sharing metadata amoung frameworks" (original "Um Modelo para Compartilhamento de Metadados entre Frameworks"), 2009. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Bruno Cavalcante da Costa and Leandro Pecora Figueredo. "A metadata-based architecture for the integration between web applications and mobile platforms" (original "Uma arquitetura baseada em metadados para integração entre aplicações Web e plataformas móveis'), 2009. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Emmanuel Santana and Sandro Tanaka. "JQuati: a tool for precision test in joint points" (original "JQuati: Uma Ferramenta para Teste de Precisão de Conjunto de Junção"), 2009. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Renato Vinícius Filipov. "Metrics for the deployment of AJAX technology in web applications" (original "Métricas para Implantação de Tecnologia AJAX em Sistemas Web"), 2008. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Andrea Cavalcante Ferreira and Renato de Queiroz Mello. "A quantitative study of SCRUM Applied to software projects" (original "Estudo Quantitativo do SCRUM aplicado a projetos de software"), 2008. Graduate specialization course in Software

Engineering, Instituto Tecnológico de Aeronáutica.
- Fernando Pavão. "Design patterns for metadata-based frameworks and components" (original "Padrões de projetos para frameworks e componentes baseados em metadados"), 2008. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.
- Jefferson Silva. "Aspect-oriented frameworks based on metadata" (original "Frameworks Orientados a Aspectos baseados em Metadados"), 2008. Graduate specialization course in Software Engineering, Instituto Tecnológico de Aeronáutica.Monografia.

Additional Information about Teaching

- His teach experience started on 1999, when, as a volunteer, he taught chemistry classes for underprivileged students to try the admission test for universities in Brazil (1999-2000), being also responsible for preparing all the didactic material used in the classes.

Research

Research Statement

My research activity could be summarized as a continuous search for better ways to develop software. Even before graduation, I was always involved in software development projects and with industry professionals. Consequently, I always looked at the research topics in software engineering with the eyes of the practitioner, identifying real problems to focus on.

Back in 2002, when I graduated, working with software development in the Brazilian Air Force, I was one of the early adopters of Agile methods, pushing the team toward TDD and short iterations. Feeling difficulty maintaining the test code, I proposed to my Master supervisor to work in the field of test code refactoring. My Master's thesis was one of the pioneers in Agile methods research in Brazil, being the first in the country to focus on this theme.

One year later, with the introduction of code annotations in the Java language, I became fascinated by the possibilities that it could bring to software design, but by that time, only a little material was available about that. This code feature was the sparkle that motivated the theme of my PhD thesis, which focused on metadata-based frameworks. Through the years, my work contributed to techniques for designing and assessing annotated code. Some relevant contributions to this field are: a pattern language and a reference architecture to metadata-based frameworks, a metrics suite for the assessment of code annotations, the conduction of several experiments that evaluated the usage of this kind of framework in several contexts, the development of diverse frameworks that use a metadata-based approach to propose an innovative solution to several fields (like access control, gamification, and continuous experimentation), and, more recently, a software visualization tool to assess the code annotation distribution. Even with all these contributions, much work is still to be done. In the following years, I intend to continue researching in this field, focusing on assessing the impact of individual annotation design practices and proposing new techniques based on code conventions to manage the high number of annotations on some applications.

After finishing my Ph.D. in 2010, since I was still an officer in the Brazilian Air Force, I was invited to stay developing research and teaching activities at the Instituto Tecnológico de Aeronáutica (ITA), where I remained until 2013. From the period between 2013 and 2020, I assumed a tenured researcher position in Instituto Nacional de Pesquisas Espaciais (INPE). The selection was through a public tender composed of a written test, a CV evaluation, a research project presentation, and an interview. I started as an Adjunct Researcher, was promoted to Associate Researcher in 2016, and was promoted to Senior Researcher in 2019.

At INPE, I participated in a master's and Ph.D. program in Applied Computing, in which I supervised students and acted on the course council. In this course, I assumed the position of interim coordinator for eight months. In this position, a considerable amount of my time was focused on the institute's projects, which unfortunately impacted my publications. For instance, I was the software architect responsible for the project LEONA (Transient Luminous Event and Thunderstorm High Energy Emission Collaborative Network in Latin America), and I acted as a board member in a seat focused on software engineering in the Brazilian Space Weather Program, called EMBRACE. However, during this period, several papers published reported studies performed in the context of these projects, which evidence my experience in developing research applied in real projects and the capacity to collaborate with research projects from other fields.

Between 2020 and 2023, I asked for an unpaid leave at INPE and assumed an RTD position at Unibz. To have more time to the research activity and the access to resources reflected positively in my publications, both in number and quality.

Also, during this period, my three first Ph.D. students published their main results and finished their thesis. In 2023, I asked resignation to my position in INPE to assume a second RTD contract at Unibz and decided to search for a tenured position in Italy. Aligned with the goal, in 2023, I obtained the Abilitazione Scientifica Nazionale for the sectors 09/H1 and 01/B1.

An important characteristic in my research profile is the involvement of students from all levels, including bachelor and Master. That can be evidenced by my large record of supervisions and student's co-authorship in my published papers. That evidence my skills to present the value of having a scientific publication to students and to organize my research agenda to allow students from all levels to do a relevant contribution with the knowledge and time they have available.

Besides the topic of code annotations and frameworks that I developed in my PhD, I contributed significantly to other programming and software architecture fields, such as adaptive object models (AOM), test-driven development (TDD), and microservices. In my last years at Unibz, I joined the Software Startups Global Research Network, and software development in startups also became one of my lines of research. Following this line of research, guided by my background in agile methods, I collaborated and contributed to my current research group, having publications focused on UX practices and hypothesis engineering. This experience shows that, besides my lines of research, I am also open to contributing to my local research group, using my software engineering background to participate in its research projects and develop research on its topics.

My relationship with the pattern community is another essential pillar of my research history. The patterns complement my research work since they are a way to represent some of the findings in a way that they can be understood and used by practitioners. I am deeply involved in organizing pattern conferences as a Hillside Group board member. I was the program chair of the Conference on Pattern Languages of Programming (PLoP) in 2012 and 2022, the most important international conference in the patterns field. I was also the invited Keynote at international pattern conferences, including PLoP and SugarLoafPLoP.

Another scientific community that I have a relevant participation in is Agile software development. Besides being the organizer of the Brazilian Workshop on Agile Methods, I am also active in the international community, participating in the organization of the International Conference on Agile Software Development (XP), the pioneer and most relevant in the field. In 2021, I was the Research Workshop chair, and for 2024 I am one of the program chairs.

When I worked in INPE, I submitted several projects in competitive calls to important Brazilian funding agencies, FAPESP and CNPq, having several of them accepted. During my contracts in Unibz, I was the PI of three projects that were selected in competitive calls and funded with university internal funds.

Academic Conference Organization *Program chair experiences highlighted*	• 30th European Conference on Pattern Languages of Programs, People, and Practices **(2025 conference chair, 2026 program chair)** • The 40th ACM/SIGAPP Symposium On Applied Computing (**2025, 2026 Cloud Continuum track chair**) • CBSoft 2026 - Congresso Brasileiro de Software: Teoria e Prática (general organizer) • International Conference on Agile Software Development (XP) (2021 as research workshops chair, **2024 as program chair**) • Conference on Pattern Languages of Programming - PLoP (**2012 as program chair, 2022 as program chair**) • ICSOB 2022 – The 13 International Conference on Software Business (2022 as industry chair)

- AMP 2022 : Third International Workshop on Agility with Microservices Programming Co-Located with XP 2022 (**2022 as program chair**)
- \<Programming\> 2022 (2022 as research workshops chair)
- The Brazilian Conference on Software: Theory and Practice - CBSoft 2020 - Workshop on Theses and Dissertations (**2020 as program chair**)
- Brazilian Workshop on Agile Methods - WBMA (**2014 - program chair**, 2018 as local organizer)
- The Brazilian Conference on Software: Theory and Practice - CBSoft (2018 as short courses chair)
- Workshop de Computação Aplicada (WorCAP) (2015 and 2016 as organizer)
- Brazilian Workshop on Systematic and Automated Software Testing - SAST (**2013 as program chair**)
- Latin-American Conference on Pattern Languages of Programming – SugarLoafPLoP (**2014 as program chair**)
- SPLASH Wavefront Experience (**2013 as program chair)**
- Mini Latin-American Conference on Pattern Languages of Programming - MiniPLoP Brasil (2011 as general organizer, **2013 as program chair**)
- Workshop of Agile Software Development Techniques (WAGILE) in International Conference on Computational Science and its Applications (**2014 as program chair**)

Journal Editor

- Special issue "Agile and Lean: How far did we come and what's next?", 2024, Information and Software Technology (IST), Guest editors: Eduardo Guerra, Darja Smite, Xiaofeng Wang. https://www.sciencedirect.com/special-issue/1030C2L9KD1
- Special issue "Cloud Continuum", 2025, Future Generation Computer Systems, Guest Editors: Alfredo Goldman, Eduardo Guerra, Jean Luca Bez. Current status: review phase.

Invited Keynotes

- 27th International Conference on Agile Software Development, São Paulo, Brazil (invited). Uncertainty in the Future of Agile Software Architecture (proposed title), 2026.
- 30th Conference on Pattern Languages of Programs - PLoP 2023, Monticello, Illinois, USA. Using Hypotheses Engineering to Manage Uncertainty in Software Architectures, 2023.
- International Conference on IT and Industrial Technologies (ICIT), Chiniot, Punjab, Pakistan. Techniques to Evolve the Software Architecture in an Agile Project, 2023.
- Web.Br Conference, São Paulo, Brazil. Between random metrics and guessing? Software analytics to the rescue!, 2019.
- 12th Latin American Conference on Pattern Languages of Programming - SugarLoafPLoP 2018, Valparaíso, Chile. Patterns for adopting software analytics in small and medium size agile teams, 2018.
- 8th Brazilian Workshop on Agile Methods at Agile Brazil, Belém, Brazil. Agile Software Architecture Practices, 2017.
- 11th Latin American Conference on Pattern Languages of Programming, SugarLoafPLoP 2016, Buenos Aires, Argentina. Agile Architecture Patterns, 2016.
- 17th Conference on Pattern Languages of Programs - PLoP 2010, Reno, USA. Framework Evolution: from Inheritance to

Metadata, 2010.

Journal Peer review	Confirmed Peer Reviews on Web of Science (https://www.webofscience.com/wos/author/record/813673)

- IET Software (5 reviews)
- IEEE Transactions on Software Engineering (10 reviews)
- IEEE Software (3 review)
- Journal of Software Engineering Research and Development (4 reviews)
- Journal of the Brazilian Computer Society (3 reviews)
- Journal of Internet Services and Applications (1 review)
- Plos One (1 review)
- Multimedia Tools and Applications (2 reviews)
- Software: Practice and Experience (1 review)
- ACM Transactions on Software Engineering and Methodology (3 review)

Other reviews

- Information and Software Technology - IST (8 reviews)
- The Journal of Systems and Software - JSS (6 reviews)
- Transactions on Software Engineering (3 reviews)

Membership of academic groups

- Hillside Group (*non-profitable group that promotes the use of patterns and pattern languages to record, analyze, and share knowledge*), member of the board (2016-2025), https://hillside.net/
- Software Startups Global Research Network (*disseminate novel research findings in the context of software startup and informing entrepreneurs with necessary knowledge, tools and methods to minimise threats and maximise chances of successes*), member, https://softwarestartup.org/
- GAME Science Research Center (*promoting, supporting and spreading the research in the field of Game Science*), member, https://gamescience.imtlucca.it/game-sci-re-center

Participation in program committees

- European Conference on Software Architecture (ECSA) (2025)
- International Conference on Information Systems Development (ISD) - Lean and Agile Software Development (2024-today)
- Advances in Software Startups: Engineering, Business and Beyond (AiSIS) (2024)
- International Conference on Software Engineering (ICSE) - Software Engineering in Practice track (2024-today)
- International Conference on on Product-Focused Software Process Improvement (PROFES) (2023)
- Lean and Agile Software Development (LASD) at ACM/SIGAPP Symposium on Applied Computing (SAC) (2023)
- European Conference on Pattern Languages of Programming - EuroPLoP (2023-today)
- Technical track on Software Architecture: Theory, Technology, and Applications (SA-TTA) at ACM/SIGAPP Symposium on Applied Computing (SAC) (2021-today)
- International Conference on Software Business – ICSOB (2021-

today)
- IEEE International Conference on Services Computing – IEEE SCC (2020)
- International Symposium on Open Collaboration - OpenSym (2020)
- The Brazilian Conference on Software: Theory and Practice - CBSoft - Tools section (2020-today)
- International Workshop on Agility with Microservices Programming - AMP (2020-today)
- Brazilian Symposium on Software Engineering - SBES - Insightful Ideas & Emerging Results Track (2019-2021)
- International Conference on Agile Software Development – XP (2018-today)
- The Brazilian Conference on Software: Theory and Practice – CBSoft – Tools section (2018-2021)
- Workshop on Meta-Programming Techniques and Reflection – META (2018)
- The Brazilian Conference on Software: Theory and Practice – CBSoft – Workshop on Theses and Dissertations (2017-2021)
- Agile Portugal (2017)
- Asian Conference on Pattern Languages of Programming - AsianPLoP (2015-2019)
- Software Quality Assurance in Large Scale and Complex Software-intensive Systems (2015)
- The Second Latin-American School on Software Engineering - ELA-ES (2015-2016)
- Workshop on Software Visualization, Evolution and Maintenance – VEM (2015-2020)
- International Conference on Computational Science and its Applications (2014-2021)
- Workshop on Software Modularity – WMod (2014)
- Workshop on Tools and Technologies for Virtual Laboratories - TTVL (2014)
- Fórum de Educação em Engenharia de Software (2014)
- INForum Software Science and Engineering - SOFT-PT (2014)
- International Free Software Workshop - WSL (2014-2017)
- Brazilian Symposium on Components, Architectures and Software Reuse - SBCARS (2013-today)
- SPLASH (Systems, Programming, Languages and Applications:
- Software for Humanity) Wavefront Experience Track (2012-2013)
- The Brazilian Conference on Software: Theory and Practice - CBSoft – Industry track (2013-2021)
- Workshop de Computação Aplicada (WorCAP) (2013-2014)
- Latin-American Workshop on Aspect-Oriented Software Development – LA-WASP (2012-2013)
- Brazilian Workshop on Agile Methods – WBMA (2012-today)
- Brazilian Symposium on Systematic and Automated Software Testing – SAST (2011-2017; 2020-2021)
- Conference on Pattern Languages of Programming - PLoP (2011-today)
- Latin-American Conference on Pattern Languages of Programming - SugarLoafPLoP (2010-today)
- ECOOP Doctoral Symposium (2009)
- Simpósio de Aplicações Operacionais em Áreas de Defesa –

SIGE (from 2008-2012)

PhD supervisions   Concluded supervisions:

- Fernando de Oliveira Pereira. A Transparent Polyglot Persistence Layer Approach To Accessing Different Types of Databases. 2025. PhD in Applied Computing - Instituto Nacional de Pesquisas Espaciais. Co-advisor: Reinaldo Rosa.
- Elaino Kelson. ArchHypo: A Technique for Uncertainties Management in Software Systems Architecture for Agile Projects (original in Portuguese: ArchHypo: Uma Técnica de Gestão de Incertezas em Arquitetura de Sistemas de Software em Projetos Ágeis"). 2024. PhD in Spatial Engineeering - Instituto Nacional de Pesquisas Espaciais. Co-advisor: Mauricio Ferreira.
- Luana Silveri, Esercizio di pensiero sistemico attraverso i giochi cooperativi come strumento per la didattica della biologia e lo sviluppo di competenze trasversali per l'apprendimento profondo delle relazioni complesse alla base dei sistemi biologici - un caso studio nella scuola secondaria di secondo grado. 2024. PhD in General Pedagogy, co-supervisor, main supervisor Federico Corni.
- Thatiane de Oliveira Rosa. CharM — A Model for Characterizing the Architecture of Service-based Systems. 2023. PhD in Computer Science – Federal University of São Paulo (USP), co-advisor, main supervisor Alfredo Goldman.
- Joelma Choma. An approach to supporting agile teams in software analytics activities. 2021. PhD in Applied Computing - Instituto Nacional de Pesquisas Espaciais, main supervisor, co-supervisor Tiago Silva da Silva.
- Phyllipe de Souza Lima Francisco. Assessing Code Annotations Usage in Software Projects. 2021. PhD in Applied Computing - Instituto Nacional de Pesquisas Espaciais, main supervisor, co-supervisor Paulo Meirelles.

Ongoing PhD Supervisions

- João Francisco Lino Daniel, A Reference Architecture for Pluggable and Extensible Microservices, PhD in Computer Science, main supervisor, co-supervisor Xiaofeng Wang. Expected end: 2026.
- Isadora Valle Sousa. Value-Based Analysis of the Return on Modeling Effort in Ontology-Driven Conceptual Modeling Ecosystems. Start: 2021. Expected end: 2026. PhD in Computer Science – University of Twente. Co- supervisor, main supervisor Giancarlo Guizzardi.
- Everaldo de Avila Gomes Junior. Improving metadata configuration through Declarative Definition of Convention over Configuration (D2C2). Start: 2023. Expected end: 2026. PhD in Computer Science – Federal University of São Paulo (USP), co-supervisor, main supervisor Paulo Meirelles.
- Jonathan Carvalho. An Agentic Architecture for Software Architecture Uncertainties Management. Start: 2025. Expected end: 2028. PhD in Computer Science – Federal University of São Paulo (UNIFESP). Co-supervisor, main supervisor Fabio Silveira.

PhD Examinator   Second Reader:

- Ghamgosar Kisomi Ali. Integrating AI and Machine Learning into Self-Healing Infrastructure-as-Code. Advanced-Systems Engineering PhD Program, 40th Cycle, 2025.
- Mohammad Hajian Berenjestanaki. Scalability Challenges and Prospects in Electronic Voting Systems Based on Blockchain Technology, Advanced-Systems Engineering PhD Program, 37th Cycle, 2023/2024.

PhD Examinator at the defense:

- Bruno Borlini Duarte. An Ontology-based Reference Model for the Software Systems Domain with a focus on Requirements Traceability, 2022. Prof. Vitor Souza and Prof. Giancarlo Guizzardi, PhD in Informatics, Federal University of Espirito Santo.
- Pedro Henrique Dias Valle. Tomada de decisões arquiteturais sobre interoperabilidade em sistemas intensivos em software (title translated: Making architectural decisions about interoperability in software-intensive systems), 2021. Prof. Elisa Yumi Nakagawa, PhD in Computer Science, University of São Paulo.
- Fabio Villamarin Arrebola. Modelo de sugestão de código-fonte baseado em modelos de linguagem organizados em um contexto hierárquico (title translated: Source code suggestion model based on language models organized in a hierarchical context), 2018. Prof. Plinio Thomaz Aquino Júnior, PhD in Eletric Engineering, Centro Universitário da Fundação Educacional Inaciana "Padre Sabóia de Medeiros" (FEI).
- Graziela Simone Tonin. Technical Debt Management in the Context of Agile Methods in Software Development, 2018. Prof. Alfredo Goldman and Prof. Carolyn Seaman, PhD in Computer Science, University of São Paulo.
- Rodrigo de Almeida Vilar de Miranda. Decomposição e Reúso de Componentes baseados em Metadados para Interfaces Gráficas do Usuário em Aplicações Corporativas Web (title translation: Decomposition and Reuse of Metadata-based Components for Graphical User Interfaces in Enterprise Web Applications). Prof. Hyggo Oliveira de Almeida e Angelo Perkusich, PhD in Computer Scicence, Federal University of Campina Grande.
- Maurício Finavaro Aniche. Architectural Roles in Code Metric Assessment and Code Smell Detection, 2016. Prof. Marco Gerosa, PhD in Computer Science, University of São Paulo.
- Viviane Almeida dos Santos. Compartilhamento de conhecimento inter-equipes: O processo de socialização do conhecimento tácito em contextos ágeis de desenvolvimento de software (title translation: Inter-team knowledge sharing: The process of socialization of tacit knowledge in agile software development contexts), 2013. Prof. Alfredo Goldman, PhD in Computer Science, University of São Paulo.
- Roberto Miranda Meirelles. Monitoramento de métricas de código-fonte em projetos de software livre (title translation:

Monitoring source code metrics in open source projects), 2013. Prof. Fabio Kon, PhD in Computer Science, University of São Paulo.

- Helves Humberto Domingues. Replicação assíncrona em bancos de dados evolutivos (title translation: Asynchronous replication in evolutionary databases), 2011. Prof. Fabio Kon, PhD in Computer Science, University of São Paulo.

Research Grants

Research projects (principal investigator)

Competitive calls

Date granted	Funding Body	Title	Amount received
10/2024	UniBZ	Empowering Web Applications End-users to Make Sustainable Choices	€ 41.426,94
10/2019	UniBZ	ADaptive software VERBosity	€ 100.000,00
07/2020	UniBZ	A Study on the Impact of Code Annotations on Software Maintenance	€ 3.225,00
11/2015	FAPESP	Programing Interface for Metadata Retrieval on Object-oriented Language Elements	R$ 48.662,38 US$ 2.843,85
11/2014	CNPq	Arquitetura para o Mapeamento de Modelos de Objetos Adaptativos para uma API Baseada em Classes Estáticas (translation: Architecture for Mapping Adaptive Object Models to an API Based on Static Classes)	R$ 20.975,00
11/2014	CNPq	Lightweight Software Variability Management for Space Weather Applications	R$ 50.637,61
12/2013	CNPq	Um Framework para Construção de Modelos de Objetos Adaptativos Híbridos (translation: A Framework for Building Hybrid Adaptive Object Models)	R$ 28.433,45
11/2012	CNPq	Jogos computacionais como estímulo à formação de engenheiros: um evento apoiado pela iniciativa ITAbits (translation: Computer games as a stimulus for the training of engineers: an event supported by the ITAbits initiative)	R$ 26.848,00

Research projects (member of research team)

Year granted	Funding Body	Title	Award holder
2023	Alpine Space - Interreg	Fostering gReen infrAstruCture in The ALps	Mitta Drius
2022	UniBZ	Startup Digi-Dojo: A Digital Space Supporting All-Remote Startups towards a Sustainable Way of Working	Xiaofeng Wang
2021	FAPESP	Turning Padawans into Jedis: Using worked examples to improve the newcomer's skills in open software projects	Igor Scaliante Wiese
2020	FAPESP	A Study About the Impact of Code Annotations in Software Evolution [1]	Paulo Roberto Miranda Meirelles

2019	FAPESP	An Extensible Infrastructure for Planning, Running, Analyzing and Packaging Experiments in Software Engineering	Fábio Fagundes Silveira
2018	FAPESP (PIPE)	AOM Framework for Dynamic Adaptation of Multi Tenant ERP Systens Available as a Service [2]	Elaino Kelson Teixeira da Silva
2015	FAPESP	A portal for newcomer developers to open source software communities	Marco Aurelio Gerosa
2014	CNPq	Teste de Interesses Dinâmicos em Aplicações Orientadas a Aspectos (translation: Test of Dynamic Interests in Aspect-Oriented Applications)	Fábio Fagundes Silveira
2012	FAPESP	LEONA: Transient Luminous Event and Thunderstorm High Energy Emission Collaborative Network in Latin America	Eliah Fernanda de Maria de São Sabbas Tavares

[1.] *This project was elaborated and submitted by Eduardo Guerra, but the grant was transferred to Paulo Meireles due the position accepted in UniBZ.*
[2.] *This project was elaborated by Eduardo Guerra to a call for support research in small companies, and for that reason it was submitted by the company owner. The grant was approved but it was not executed due to burocracy issues in Instituto Nacional de Pesquisas Espaciais.*

Bachelor student scholarships for scientific initiation
* This scholarship is provided by Brazilian funding agencies to bachelor students to develop a 1-year research project. The funding is obtained by the supervisor through a project submission.

Year granted	Funding Body / Institution	Title	Student
2016	CNPq / INPE	Criação de Biblioteca de Metadados para Framework de Gamificação (translation: Creating Metadata Library for Gamification Framework)	Jeremias Ponciano
2016	CNPq / INPE	Solução Reutilizável para Consumo de Anotações de Código (translation: Reusable Solution for Consumption of Code Annotations)	Gabriel Amboss Pinto
2015	CNPq / INPE	Arquitetura para Tradução de Modelos Dinâmicos para Modelos Estáticos de Classe (translation: Architecture for Translating Dynamic Models to Static Class Models)	Jean Novaes Santos
2014	CNPq / INPE	Framework Baseado em Metadados para Inserção de Gamification em Aplicações (translation: Metadata-Based Framework for Embedding Gamification in Applications)	Hugo Alexandro Souza
2012	CNPq / ITA	Avaliação Histórica de Projetos de Software (translation: Historical Evaluation of Software Projects)	Lucas Amaral Cunha de Assis

Publications (books and book chapters)

Books authored:

- *Guerra, E. M.* Componentes Reutilizáveis em Java com Reflexão e Anotações, in Portuguese (title translation: Reusable Components with Reflection and Annotations). 1. ed. São Paulo: Casa do Código, 2014. v. 1. 380p.

- *Guerra, E. M.* Design Patterns com Java - Projeto Orientado a Objetos Guiado por Padrões, in Portuguese (title translation: Design Patterns with Java – Object-oriented Design Based on Patterns). 1. ed. São Paulo: Casa do Código, 2013, v. 1, 251p.

Books edited:

- Darja Smite, Eduardo Guerra, Xiaofeng Wang, Michele Marchesi, Peggy Gregory. Agile Processes in Software Engineering and Extreme Programming - 25th International Conference on Agile Software Development, XP 2024, Bozen-Bolzano, Italy, June 4-7, 2024, Proceedings. Lecture Notes in Business Information Processing 512, Springer 2024, ISBN 978-3-031-61153-7, DOI: https://doi.org/10.1007/978-3-031-61154-4.
- Eduardo Guerra, MundoJ Java Efetivo, in Portuguese (title translation: MundoJ Effective Java). 1 ed. São Paulo, Casa do Código, 2014, v. 1, 68p.
- Eduardo Guerra, MundoJ Segurança com Java, in Portuguese (title translation: MundoJ Security with Java). 1 ed. São Paulo, Casa do Código, 2014, v. 1, 75p.
- Eduardo Guerra, MundoJ Orientação a Objetos, in Portuguese (title translation: MundoJ Object Orientation). 1 ed. São Paulo, Casa do Código, 2014, v. 1, 82p.

Book Chapters:

- Guerra, E., Melegati, J., Montesin, D. (2026). Hypotheses Engineering in Software Startups: From Business to Architecture. In: Tripathi, N., Edison, H., Wang, X. (eds) Advances in Software Startups. Springer, Cham. DOI: 10.1007/978-3-032-04294-1_7
- Nakov, M., Wang, X., Guerra, E. (2026). Patterns for Startup Pitch Video Creation with Generative AI Support. In: Tripathi, N., Edison, H., Wang, X. (eds) Advances in Software Startups. Springer, Cham. DOI: 10.1007/978-3-032-04294-1_5
- Melegati, J., & Guerra, E. (2024). DAnTE: a taxonomy for the automation degree of software engineering tasks. In Generative AI for Effective Software Development (pp. 53-70). Cham: Springer Nature Switzerland. DOI: 10.1007/978-3-031-55642-5_3
- *Guerra, E.*, & Aniche, M. (2016). Achieving quality on software design through test-driven development. In *Software Quality Assurance* (pp. 201-220). Morgan Kaufmann. DOI: 10.1016/B978-0-12-802301-3.00009-0
- *Guerra, E. M.*, & Oliveira, E. (2013). Metadata-based frameworks in the context of cloud computing. In Cloud Computing (pp. 3-24). Springer, London. DOI: 10.1007/978-1-4471-5107-4_1

Publications (journal papers)

- Nguyen-Duc, A., Cabrero-Daniel, B., Przybylek, A., Arora, C., Khanna, D., Herda, T., Rafiq, U., Melegati, J., Guerra, E., Kemell, K., Saari, M., Zhang, Z., Le, H., Quan, T., Abrahamsson, P. (2025) Generative Artificial Intelligence for Software Engineering - A Research Agenda. Software: Practice and Experience. DOI: 10.1002/spe.70005
- Maqsood, H. M., Choma, J., Guerra, E., Bondavalli, A. (2025) A Systematic Literature Review on Application of Agile Software

Development Process Models for the Development of Safety-Critical Systems in Multiple Domains, IET Software, 5227350, 24 pages. DOI: 10.1049/sfw2/5227350

- Valle, I., Sales, T. P., Guerra, E., Daneva, M., Guizzardi, R., da Silva Santos, L. O. B., ... & Guizzardi, G. (2025). Unraveling the pain points of domain modeling. Information and Software Technology, 183, 107736. DOI: 10.1016/j.infsof.2025.107736
- Gomes, E., Guerra, E., Lima, P., & Meirelles, P. (2025). An approach based on metadata to implement convention over configuration decoupled from framework logic. Journal of Software: Evolution and Process, 37(5), e70028. DOI: 10.1002/smr.70028
- Choma, J., da Silva, T.S., Guerra, E.M. (2025). Pattern Language for Lightweight and Interactive Software Analytics Process. In: Wallingford, E., Zdun, U., Kohls, C. (eds) Transactions on Pattern Languages of Programming V. Lecture Notes in Computer Science, vol 14630. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-662-70810-1_4
- Silva, K., Melegati, J., Silveira, F., Wang, X., Ferreira, M., & Guerra, E. (2025). ArchHypo: Managing Software Architecture Uncertainty Using Hypotheses Engineering. *IEEE Transactions on Software Engineering*, *51*(02), 430-448. DOI: 10.1109/TSE.2024.3520477
- Rafiq, U., Wang, X., & Guerra, E. (2024). Data analytics in software startups: Understanding key concepts and critical challenges. Information and Software Technology, 107652. DOI: 10.1016/j.infsof.2024.107652
- Guerra, E., Gomes, E., Ferreira, J., Wiese, I., Lima, P., Gerosa, M., & Meirelles, P. (2024). How do annotations affect Java code readability?. Empirical Software Engineering, 29(3), 1-31. DOI: 10.1007/s10664-024-10460-w
- Silva, K., Melegati, J., Wang, X., Ferreira, M., & Guerra, E. (2024). Using Hypotheses to Manage Technical Uncertainty and Architecture Evolution in a Software Start-up. IEEE Software, 41(4), 7-13. DOI: 10.1109/MS.2024.3383628
- Guerra, E. M., Ivo, A. A., Pereira, F. O., Robbes, R., Janes, A., & Silveira, F. F. (2024). Impermanent identifiers: Enhanced source code comprehension and refactoring. Journal of Systems and Software, 112137. DOI: 10.1016/j.jss.2024.112137
- Melegati, J., Wiese, I., Guerra, E., Chanin, R., Aldaeej, A., Mikkonen, T., ... & Wang, X. (2024). Product managers in software startups: A grounded theory. Information and Software Technology, 107516. DOI: 10.1016/j.infsof.2024.107516
- Lemos, O., Silveira, F., Ferrari, F., Silva, T., Guerra, E., Garcia, A. (2024) Unraveling the code: an in-depth empirical study on the impact of development practices in auxiliary functions implementation. Software Quality Journal. DOI: 10.1007/s11219-024-09682-4.
- de Oliveira Rosa, T., Guerra, E. M., Correia, F. F., & Goldman, A. (2023). CharM—Evaluating a model for characterizing service-based architectures. Journal of Systems and Software, 111826, doi: 10.1016/j.jss.2023.111826.
- Lima, P., Melegati, J., Gomes, E., Pereira, N. S., Guerra, E., & Meirelles, P. (2023). CADV: A software visualization approach for code annotations distribution. Information and Software

Technology, 154, 107089. DOI: 10.1016/j.infsof.2022.107089

- Hooshyar, H., Guerra, E., Melegati, J., Khanna, D., Aldaeej, A., Matturro, G., ... & Nguyen-Duc, A. (2023). Impact in Software Engineering Activities After One Year of COVID-19 Restrictions for Startups and Established Companies. IEEE Access, vol. 11, pp. 55178-55203, 2023, doi: 10.1109/ACCESS.2023.3279917.
- Nguyen-Duc, A., Khanna, D., Huong Le, G., Greer, D., Wang, X., Zaina, L., Matturro, G., Melegati, J., Guerra, E., Kettunen, P. Hyrynsalmi, S., Edison, H., Sales, A., Chanin, R., Rutitis, D., Kemell, K., Aldaeej, A., Mikkonen, T., Garbajosa, J., Abrahamsson, P. (2023). Work-from-home impacts on software project: A global study on software development practices and stakeholder perceptions, 1-31. *Software: Practice and Experience*. DOI: 10.1002/spe.3306
- Pereira, F., França, D., Paschoal, V., Nardes, M., Rosa, R. R., Guerra, E. (2023) Esfinge Virtual Lab—A Virtual Laboratory Platform With a Metadata-Based API and Based on Dynamic Component. IEEE Access, vol. 11, pp. 143167-143181. DOI: 10.1109/ACCESS.2023.3342911.
- Lima, P., Pereira, N. S., Gomes, E., Guerra, E., & Meirelles, P. (2023). Annotation Visualizer: A software visualization tool for code annotations. Software Impacts, 16, 100491. DOI: 10.1016/j.simpa.2023.100491
- Teixeira, T. S. R., Silveira, F. F., & Guerra, E. M. (2023). Moving towards a Mutant-Based Testing Tool for Verifying Behavior Maintenance in Test Code Refactorings. Computers, 12(11), 230. DOI: 10.3390/computers12110230
- Choma, J., *Guerra, E. M.*, Alvaro, A., Pereira, R., & Zaina, L. (2022). Influences of UX factors in the Agile UX context of software startups. Information and Software Technology, 152, 107041. DOI: 10.1016/j.infsof.2022.107041
- Choma, J., *Guerra, E. M.*, da Silva, T. S., & Zaina, L. M. (2022). An approach to explore sequential interactions in cognitive activities of software engineering. Information and Software Technology, 141, 106730. DOI: 10.1016/j.infsof.2021.106730
- Melegati, J., *Guerra, E.*, & Wang, X. (2022). HyMap: Eliciting hypotheses in early-stage software startups using cognitive mapping. Information and Software Technology, 144, 106807. DOI: 10.1016/j.infsof.2021.106807
- *Guerra, E.*, Dias, A. D. O., Véras, L. G. D., Aguiar, A., Choma, J., & Da Silva, T. S. (2021). A Model to Enable the Reuse of Metadata-Based Frameworks in Adaptive Object Model Architectures. IEEE Access, 9, 85124-85143. DOI: 10.1109/ACCESS.2021.3087795
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- Bernardino, M. T., Belinassi, G., Meirelles, P., *Guerra, E. M.*, & Goldman, A. (2020). Improving Parallelism in Git and GNU Compiler Collection: Strategies, Difficulties, and Lessons Learned. IEEE Software, 38(5), 92-100. DOI: 10.1109/MS.2020.3020932
- Lima, P., Guerra, E., & Meirelles, P. (2020). Annotation sniffer: a tool to extract code annotations metrics. *Journal of Open Source*

Software, *5*(47), 1960. DOI: 10.21105/joss.01960

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- Ivo, A. A., *Guerra, E. M.*, Porto, S. M., Choma, J., & Quiles, M. G. (2018). An approach for applying Test-Driven Development (TDD) in the development of randomized algorithms. Journal of Software Engineering Research and Development, 6(1), 1-31. DOI: 10.1186/s40411-018-0053-5
- de Sousa, E. P., & *Guerra, E. M.* (2016). ESHistory: Ferramenta de Extração de Métricas Históricas para Projetos JavaScript (title translation: ESHistory: Historical Metrics Extraction Tool for JavaScript Projects). Tecnia, 1(2), 131-142.
- Pinto, A. F., Terra, R., *Guerra, E.*, & São Sabbas, F. (2017). Introducing an Architectural Conformance Process in Continuous Integration. J. Univers. Comput. Sci., 23(8), 769-805. DOI: 10.3217/jucs-023-08-0769
- *Guerra, E. M.*, Silva, J. O., & Fernandes, C. T. (2015). A Modularity and Extensibility Analysis on Authorization Frameworks. Journal of Information Security and Cryptography (Enigma), 2(1), 36-47. DOI: 10.17648/enig.v2i1.46
- *Guerra, E.* (2014). Designing a framework with test-driven development: A journey. IEEE software, 31(1), 9-14. DOI: 10.1109/MS.2014.3
- Matsumoto, P. M., & *Guerra, E.* (2014). An Approach for Mapping Domain-Specific AOM Applications to a General Model. J. Univers. Comput. Sci., 20(4), 534-560. DOI: 10.3217/jucs-020-04-0534
- *Guerra, E.*, Souza, J. D., & Fernandes, C. (2013). Pattern language for the internal structure of metadata-based frameworks. In Transactions on Pattern Languages of Programming III (pp. 55-110). Springer, Berlin, Heidelberg. DOI: 10.1007/978-3-642-38676-3_3
- *Guerra, E.*, Alves, F., Kulesza, U., & Fernandes, C. (2013). A reference architecture for organizing the internal structure of metadata-based frameworks. Journal of Systems and Software, 86(5), 1239-1256. DOI: 10.1016/j.jss.2012.12.024
- Correia, D. A., *Guerra, E. M.*, Silveira, F. F., & Fernandes, C. T. (2010). Quality improvement in annotated code. CLEI Electron. J, 13(2). DOI:10.19153/cleiej.13.2.7

Publications (conference papers)	- Valle, I., Sales, T. P., Guerra, E., Bonino da Silva Santos, L. O., Proper, H., Guizzardi, G. (2026). Modeling Value Canvas: A tool to rationalize the value of domain modeling. In CAiSE 2026: 38th International Conference on Advanced Information Systems Engineering (accepted) - Carvalho, J., Dias, V., Silveira, F., Guerra, E., Gadelha, P., Choma, J. (2026). ArchHypo.AI: An LLM-Based Tool for Managing Software Architecture Uncertainty with Hypothesis Engineering in Agile Boards. In International Conference on Agile Software Development (accepted) - Paris, A., Silveira, F., Melegati, J., Guerra, E. (2026). Evaluating the Consequences of Process Adjustment Patterns for Handling Software Architecture Uncertainties. In International Conference

on Agile Software Development (accepted)

- Daniel, J., Mota, G., Wang, X., & Guerra, E. (2025). Architecture Refactoring Towards Service Reusability in the Context of Microservices. In International Conference on Agile Software Development (pp. 129-144). Springer, Cham. DOI: 10.1007/978-3-031-94544-1_9
- Pancher, J. C., Melegati, J., & Guerra, E. M. (2025). Exploratory Test-Driven Development Study with ChatGPT in Different Scenarios. In International Conference on Agile Software Development (pp. 145-159). Springer, Cham. DOI: 10.1007/978-3-031-94544-1_10
- Teixeira, T. S. R., Silveira, F. F., & Guerra, E. M. (2025). Mutation Testing in Test Code Refactoring: Leveraging Mutants to Ensure Behavioral Consistency. In International Conference on Agile Software Development (pp. 176-185). Springer, Cham. DOI: 10.1007/978-3-031-94544-1_12
- Moreira, I., Adolfo, L., Melegati, J., Choma, J., Guerra, E., & Zaina, L. (2025). Exploring Documentation Strategies for NFR in Agile Software Development. In International Conference on Agile Software Development (pp. 229-244). Springer, Cham. DOI: 10.1007/978-3-031-94544-1_16
- Pereira F., Guerra E. and Rosa R. (2025). A Framework Model for Supporting Transparent Polyglot Persistence with a Unified API and Extensible for Different Database Types. In Proceedings of the 27th International Conference on Enterprise Information Systems - Volume 1: ICEIS; ISBN 978-989-758-749-8 SciTePress, pages 109-120. DOI: 10.5220/0013369300003929
- Valle, I., Sales, T. P., Guerra, E., Oliveira, Í., Guizzardi, R., Bonino da Silva Santos, L. O., ... & Guizzardi, G. (2025). Friend, foe, or target? Domain models as risk deterrents, risk sources, and assets at risk. In *International Conference on Research Challenges in Information Science* (pp. 103-118). Springer, Cham. DOI: 10.1007/978-3-031-92474-3_7
- Junior, J. J. M., Melegati, J., & Guerra, E. (2025, February). Applying a Prompt Pattern Sequence for Decision-Making in Microservices Architectures. In European Conference on Service-Oriented and Cloud Computing (pp. 18-32). Cham: Springer Nature Switzerland. DOI: 10.1007/978-3-031-84617-5_2
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- Sultan, B., Ammendola, J., Guerra, E. (2024). Green Framework Patterns - Strategies for Embedding Sustainability into Application Frameworks. In Proceedings of the 31st Conference on Pattern Languages of Programs, People, and Practices (PLoP '24). The Hillside Group, USA, Article 20, 1–12. https://doi.org/10.64346/PLoP2024p58
- JMaranhão, J. O., & Guerra, E. M. (2024, July). A Prompt Pattern Sequence Approach to Apply Generative AI in Assisting Software Architecture Decision-making. In Proceedings of the 29th European Conference on Pattern Languages of Programs, People, and Practices (pp. 1-12). DOI: 10.1145/3698322.3698324

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- Silva, K., Adolfo, L. B., Coppe, A., Silveira, F. F., Ferreira, M., & Guerra, E. (2024, July). Patterns for using hypothesis engineering to manage architectural uncertainties. In Proceedings of the 29th European Conference on Pattern Languages of Programs, People, and Practices (pp. 1-8). DOI: 10.1145/3698322.3698333
- Silva, M., Costa, I., Guerra, E. (2023, November). Are business expectations aligned with the development plan made by the software architecture area? A case study on Agile teams in a large company. In International Conference on Software Business. DOI: 10.1007/978-3-031-53227-6_2
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- Daniel, J. F. L., Rosa T. O., Goldman, A., Guerra, E. (2023) Towards the Detection of Microservice Patterns Based on Metrics. In Proceedings of the 49th Euromicro Conference Series on Software Engineering and Advanced Applications (SEAA), Durres, Albania. DOI: 10.1109/SEAA60479.2023.00029
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- Viviani, L., Guerra, E., Melegati, J., Daniel, J. F. L. (2023). Anti-patterns in managing uncertain non-functional requirements. In 29th European Conference on Pattern Languages of Programs, Kloster Irsee, Germany. DOI: 10.1145/3628034.3628067
- Nasir, S., Guerra, E., Zaina, L., & Melegati, J. (2023, March). An Exploratory Study About Non-functional Requirements Documentation Practices in Agile Teams. In Proceedings of the 38th ACM/SIGAPP Symposium on Applied Computing (pp. 1009-1017). DOI: 10.1145/3555776.3577605.
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- *Guerra, E. M.*, Silveira, F. F., & Fernandes, C. T. (2009, October). Questioning traditional metrics for applications which uses metadata-based frameworks. In Proceedings of the 3rd workshop on assessment of contemporary modularization techniques (ACoM'09).
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- *Guerra, E.*, Fernandes, C. (2008) A Metadata-Based Components Model. Doctoral Symposium at 22nd European Conference on Object Oriented Programming (ECOOP 08), Pafos - Chipre.
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Citations

Information from Google Schoolar (05/03/2026)
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	All	Since 2021
Citations	1572	1009
h-index	19	13
I10-index	51	28
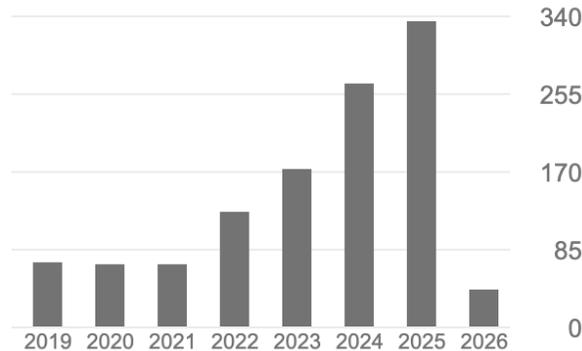
Information from Scopus (05/03/2026)
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- *517 citations by 127 documents*
- *H-index 12*

Document & citation trends
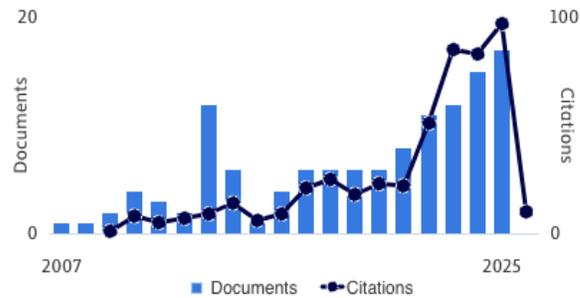
Academic-related awards	• (2024, 2025) Award for the Academic activity, Free University of Bozen-Bolzano. • (2024) Best Shepherd Award, EuroPLoP 2024. • (2018) 2º Best Paper Award, Tools Track of CBSoft 2018 • (2014) Best Paper Award, ICCSA - International Conference on Computational Science and Its Applications. • (2011) PhD Thesis chosen to represent the Electronic and Computer Engineering course of Instituto Tecnológico de Aeronáutica in the CAPES Thesis Awards of 2011. • (2010) 2º Best Paper Award, VII Workshop de Manutenção de Software Moderna - WMSWM 2010. • (2010) Best presentation, XML: APLICAÇÕES E TECNOLOGIAS ASSOCIADAS - XATA 2010. • (2002) Honorable Mention in disciplines of Math Department, Computer Engineering course, Instituto Tecnológico de Aeronáutica. • (2002) Honorable Mention in disciplines of Humanities Department, Computer Engineering course, Instituto Tecnológico de Aeronáutica. • (2002) Honorable Mention in disciplines of Computer Science Theory Department, Computer Engineering course, Instituto Tecnológico de Aeronáutica. • (1997) 1º Place in the Physics Olympics of "IX Semana de Física da UFJF", Federal University of Juiz de Fora (UFJF).
Significant research results	• *Agile software architecture approaches:* A pattern language identifying agile architecture practices was developed. Studies related to the management of uncertain non-functional requirements. Development of ArchHypo, a technique for managing architectural uncertainties based on hypothesis engineering. • *Code annotations and metadata:* Contributions on the impact of using code annotations and other metadata-based approaches, like code conventions. Several experiments and studies investigated maintenance, code readability, and class coupling implications. A metrics suite and a visualization tool were developed to support this assessment. • *Metadata-based frameworks:* Patterns about the internal design and applicability of metadata-based frameworks were investigated and documented, offering design guidance. Several frameworks developed to provide innovative solutions in more

specific domains. Esfinge Metadata offers a novel API to create this kind of framework.

- **Test-driven development (TDD):** The TDD technique was studied and further developed through several works. Examples are approaches to using TDD in classes that use reflection and with a high number of random decisions. A pattern language that documents TDD steps for iterative design was developed.
- **Adaptive-object models (AOM) framework:** This work proposed a solution and an implementation that allows AOM applications to reuse frameworks that target static classes.
- **Lean software analytics:** A lean method and a canvas were designed for using software analytics in agile teams. Case studies and empirical evaluations were performed, and a web-based support tool was developed.
- **Software startups:** In the last years, the usage of specific software engineering techniques in software startups have been studied. Some highlights are the usage of hypothesis engineering, adoption of UX practices, and impact of remote work forced by COVID pandemic.
- **Microservices design:** Developed studies related to the implementation and trade-offs of microservices patterns. Evaluation of service-based architecture to support decision-making. Contributions related to the reusability in microservices.
- **Code Augmentation:** An approach based on code augmentation that improves the developer experience by adding emojis in the code IDE visualization.
- **Modeling Value and Practice:** Empirical studies that investigate modeling practices and the value that they can bring to software projects and to the company. Proposition of tools to support decision making related to modeling approaches.

Third Mission and Extension

Statement on third mission experience

Being a software engineering researcher, I believe it is essential to be constantly in touch with real projects. As an Air Force officer in Instituto Tecnológico de Aeronáutica (ITA), I worked on important national projects, such as integrating Command and Control applications for the Ministry of Defence and analyzing the application security for a large public bank. For seven years, I was the chief editor of a magazine focused on Java programming and software engineering. I interacted heavily with industry professionals in the 41 editions I edited in this period, understanding their difficulties and needs. In my position at Instituto Nacional de Pesquisas Espaciais (INPE), besides my research activity, I also participated in several projects from the institute. One highlight is being a council member of the Brazilian space weather program called EMBRACE, participating in technical decisions about the software systems that supported their operation.

From the beginning, I always shared the code of software frameworks and development tools I developed and supervised in open-source repositories. Based on the maturity level reached by some of these projects, they can be considered relevant contributions that the industry can use to support the development of software systems. As a highlight, Esfinge Framework is an "umbrella project" with several metadata-based frameworks that explore this kind of solution applied to innovative domains. These projects were also used to evolve the knowledge about development practices and software design based on code annotations.

In the last years, at the Free University of Bozen-Bolzano, part of my third mission activities focused on the field of board game design, teaching a Studium Generale course and supporting other related activities. For example, I supported students from different faculties that developed games as part of their thesis. Additionally, I served as a game design expert in the Game Jam promoted by UniBZ in 2022 and 2023. An NDA with the Innovation Hub from NOI Techpark was signed to collaborate in the development of a gamified approach to foster innovation opportunities in companies.

In Bolzano, I also created connections with local companies in the last three years, evidenced by organizing industry challenges in my classes and participating in events focused on industry professionals. For example, in every year since 2021, I presented talks at SFSCON, the South Tyrol Free Software Conference, one of Europe's most established annual conferences on Free Software. This close contact with local companies can also be highlighted by their direct on project submissions made in the last two years and publications that involved them as subjects for the investigated software engineering techniques. In the last years, I organized initiatives with the Master's and bachelor students where they develop projects in which they interact with the local companies and present the result in public events with industry professionals. I also have a significative participation in the EDIH project, funded by the Digital Innovation Hub South Tyrol (DIS-HUB), in which I collaborated with 4 different companies and taught a course on the development of agentic AI systems.

Related to scientific dissemination activities, besides the presentations in industry-focused events, I am also the host of a podcast called Hillside PatternCast. This podcast aims to present information regarding pattern and pattern languages, mostly in the field of Computer Science, to a more general public. It started in May 2024 and publish episodes monthly, with different guests that are specialists in different fields.

Third mission activities at Unibz (2020-2026)

- Participation of EDIH (European Digital Innovation Hubs) projects in Unibz, assisting local companies with the introduction of AI in their business and products. Worked with four different companies in the orientation and test-before-invest phase.

- Participation of EDIH (European Digital Innovation Hubs) projects in Unibz, offering two sessions of the course "Development of Agentic AI Applications in Practice".
- Co-organization of the event Open Data Hub Bootcamp, on April 19th 2024 and April 8th 2025 at NOI Techpark in Bolzano/Bozen, Italy. Participants worked in teams collaborating, communicating, learning from each other and sharing best practices. Participation was free of charge.
- "Open Day @ Faculty of Engineering" (2024) and "Science Live. Get Curious!" (2025): presented a board game called "Startups Assemble!" which is used to reflect on best practices for creating software startup teams. People of all ages played the game at the event and learned important concepts while having fun! This work is a great example of how, even inside the university, games can be a great tool for communication.
- Leader of the codEEmoji open-source project, an Intellij plugin that adds emojis in the code using code augmentation to provide additional information about code elements. Even being based on the results of the ADVERB research project, the plugin focus on industry professionals and has more than 550 downloads in the Intellij Marketplace.
- Scientific dissemination as host of the Hillside PatternCast, a podcast about patterns sponsored by the Hillside Group. The first episode was released in May 2024 and, after that, monthly episodes has been released. Available at: https://podcasters.spotify.com/pod/show/the-hillside-group
- Expert in game design and programming at the Game Jam organized by the FABLAB Bolzano and UniBZ on 2022 and 2023 editions.
- The "Company Design Challenges" are exercises related to software design and architecture where the students work on a problem in the context of a local company. It was implemented in the courses System Software Architecture (Bachelor) and Advanced Software Design Techniques (Master/SEIS). The following companies already participated: Catch Solve (https://www.catch-solve.tech/en/home), Infinitys (https://infinitys.it/en), Infominds (https://www.infominds.eu/) and Video Taxi (https://www.video.taxi/).
- Teacher of the course Board Game Design (18h at 2022 and 2023; 36h at 2024 and 2025) on Studium Generale (an interdisciplinary study program available to the general public).
- Organizer of the Industry Talks track of the event ICSOB (https://icsob2022.github.io/TutorialsAndIndustryTalks/). The ICSOB event is academic and will be colocated with SFSCon (https://www.sfscon.it/), which is focused on industry participants. This track will take place at SFSCon and not during ICSOB, aiming at an industry public, not an academic one.
- Training on Agile Software Development - Delivered using Agile Approaches (TASTE), European Social Fund 2018, axis III Education, 5th call, PI: Ilenia Fronza. taste.inf.unibz.it - Collaborated with lectures on Module 2 and responsible for Module 4.

| **Relevant third mission projects** | - Esfinge Virtual Lab at Instituto Nacional de Pesquisas Espaciais (2018-today): Leader of an open-source project of a virtual lab |

and Activities in Brazil	platform that is able to dynamically load new components that provide custom data analysis services. https://brazilianspace.blogspot.com/2019/12/plataforma-de-laboratorio-virtual-do.html?m=0 • LEONA (2013-2020) at Instituto Nacional de Pesquisas Espaciais: Software architect and researcher from the project "Transient Luminous Event and Thunderstorm High Energy Emission Collaborative Network in Latin America". Coordinated activities related to the development of the software used to monitor and register Transient Luminous Events – TLEs for research and study purposes. http://www.dae.inpe.br/acatmos/leona/ https://ui.adsabs.harvard.edu/abs/2017AGUFMAE21A..05S/ • EMBRACE (2015-2019) at Instituto Nacional de Pesquisas Espaciais: Member of the council of the Brazilian Space Weather Program called EMBRACE. Participated in discussions related to technical decisions of the software platform used by the program and advised the development team about the techniques and technologies adopted. http://www2.inpe.br/climaespacial/portal/en/ • Integration of C2 Applications at Instituto Tecnológico de Aeronautica (2007-2010): Consultant of the project to define a software architecture to integrate Command and Control applications between Defense Ministry and military forces. https://www.sige.ita.br/edicoes-anteriores/2010/st/IV_1.pdf • ASTICEF at Instituto Tecnológico de Aeronautica (2007-2008): Security analysis of the systems for a large public bank in Brazil. Participated in the team responsible for software and application security.
Roles in academic courses	• Member of the Quality Assurance for the Master in Software Engineering in Free University of Bozen-Bolzano (2025- today). • Member of the selection committee for the Master in Software Engineering in Free University of Bozen-Bolzano (2022-today). • Study plan advisor for the Master in Software Engineering in Free University of Bozen-Bolzano (2021-today). • Coordinated the seminars of the Applied Computing post-graduate program in Instituto Nacional de Pesquisas Espaciais (2014 - 2019). • Interim coordinator of the Applied Computing post-graduate program in Instituto Nacional de Pesquisas Espaciais (2015 for 8 months). • Council member of the Applied Computing post-graduate program in Instituto Nacional de Pesquisas Espaciais (2014 - 2016). • Coordinator of the Command-and-Control Laboratory (LAB-C2) at Instituto Tecnológico de Aeronautica that supported works from Master and PhD students developing works within a military graduate program called PPGAO (2011-2013).
Awards related to third mission	• (2019) 1º Place in "Prêmio Ludopedia" for the game Crop Rotation Bug Plague as the Best Board Game for Children of 2018, in the category Brazilian Designer, Public's Choice. • (2019) 1º Place in "Prêmio Ludopedia" for the game Crop Rotation Bug Plague as the Best Board Game for Children of

2018, in the category Brazilian Designer, Jury's Choice.
- (2010) 1º Place in the App Category of the "1º Concurso Universitário de Aplicativos para Telefones Celulares da Sercomtel", cell phone app contest, project supervisor, Sercomtel Celular S.A.
- (2010) 3º Place in the Game Category of the "1º Concurso Universitário de Aplicativos para Telefones Celulares da Sercomtel", cell phone game contest, project supervisor, Sercomtel Celular S.A.

Articles and Media About Me and My Work

- Dalle aule di Ingegneria a Lucca Comics per parlare di Game Design, , unibz magazine, Dec 2025 https://www.unibzmagazine.it/en/magazine/article/dalle-aule-di-ingegneria-a-lucca-comics-per-parlare-di-game-design
- Pós em Ciência da Computação da UERN/UFERSA recebe visita do professor Eduardo Guerra (translation: The Graduate Program in Computer Science at UERN/UFERSA receives a visit from Professor Eduardo Guerra), UFERSA portal, Oct 2025 https://assecom.ufersa.edu.br/2025/10/06/pos-em-ciencia-da-computacao-da-uern-ufersa-recebe-visita-do-professor-eduardo-guerra
- Software Engineers of an AI-enpowered world, unibz magazine, Sept 2025 https://www.unibzmagazine.it/en/magazine/article/software-engineers-of-an-ai-enpowered-world
- One Year After my Podcast Journey: Bridging Research and Practice, unibz magazine, Jun 2025 https://www.unibzmagazine.it/en/magazine/article/one-year-after-my-podcast-journey-bridging-research-and-practice
- Know the dark to stay away from it, unibz magazine, Jan 2025 https://www.unibzmagazine.it/it/magazine/article/know-the-dark-to-stay-away-from-it
- People | Eduardo Guerra, "Il mio gioco preferito?", 16/03/2024, Salto. https://salto.bz/de/article/16032024/il-mio-gioco-preferito
- Come è nato „Breaking News"?, 07/03/2024, Salto. https://salto.bz/de/article/07032024/come-e-nato-breaking-news
- Anotações de Código e Frameworks que as Usam com Eduardo Guerra, Unibz (translation: Code Annotations and Frameworks that Use Them with Eduardo Guerra, Unibz), 16/08/2023, Fronteiras da Engenharia de Software podcast, episode 38. https://fronteirases.github.io/episodios/paginas/38
- Studying board games, 27/09/2022, Salto. https://salto.bz/en/article/27092022/studying-board-games
- Padrões de Software - Eduardo Guerra (translation: Software Patterns – Eduardo Guerra), 24/08/2020, HIDEV Podcast. https://www.listennotes.com/podcasts/hidev-podcast/padr%C3%B5es-de-software-eduardo-hIUQbzjIM_d/
- Plataforma de laboratório virtual do INPE é testada com banco de dados do EMBRACE e do CEMADEN (translation: INPE's virtual laboratory platform is tested with EMBRACE and CEMADEN databases), 16/12/2019, INPE website. http://www.inpe.br/noticias/noticia.php?Cod_Noticia=5321

Programming certifications	• Sun Certified Associate for The Java Platform, Standard Edition
	• Sun Certified Programmer for Java 2 Platform 1.4
	• Sun Certified Web Component Developer for J2EE 1.4
	• Sun Certified Business Component Developer for J2EE 1.3
	• Sun Certified Business Component Developer for the Java Platform EE 5
	• Sun Certified Java Web Services Developer for J2EE 1.4
	• Sun Certified Mobile Application Developer for the Java 2 Platform, Micro Edition
	• Sun Certified Enterprise Architect for Java 2 Platform Enterprise Edition Technology.
Editorial experience (2006-2014)	Chief-editor of a technical magazine in Brazil focused on Java programing, software engineering and agile from edition 23 to edition 64. This magazine had the names "Mundo Java" (editions 23-41), "MundoJ" (editions 42-62) and "MundoJ Ágil" (editions 63-64) and its target audience was professionals from software development industry.
	During this period, besides writing the editorials, handling articles submission and review, and organizing the content of each edition, also wrote several articles. These articles did not only present practical content for professionals, but also had the role of technology transfer, putting some research results in a more accessible language for professionals. The following were the articles published:

- *Guerra, E.* (2014). Padrões com TDD: é possível? (title translation: Patterns with TDD: is it possible?). Revista MundoJ, Curitiba, v. 63, p.54 - 59.
- *Guerra, E.* (2013). Coisas Que Você Não Sabia sobre Generics (title translation: Things You Didn't Know About Generics). Revista MundoJ, Curitiba, v. 60, p.5-11.
- *Guerra, E.* (2012). Esfinge Comparison – Um framework para Comparação de Objetos (title translation: Esfinge Comparison – A framework for Object Comparison)). Revista MundoJ, Curitiba, v. 56, p.54 - 60.
- *Guerra, E.* (2012). Esfinge QueryBuilder - Camada de Persistência Simples e Rápida (title translation: Esfinge QueryBuilder - Simple and Fast Persistence Layer). Revista MundoJ, Curitiba, v. 52, p.32 - 37.
- *Guerra, E.* (2011). Práticas para Lidar com Arquitetura em Ambientes Ágeis (title translation: Practices for Dealing with Architecture in Agile Environments). MundoJ, Curitiba, v. 50, p. 14 - 27.
- *Guerra, E.* (2011) Explorando Funcionalidades de Static Crosscutting do AspectJ (title translation: Exploring AspectJ's Static Crosscutting Features). MundoJ, Curitiba, v. 48, p. 26 – 32.
- *Guerra, E.* (2011) Programação Orientada a Aspectos para Leigos (title translation: Aspect Oriented Programming for Dummies). MundoJ, Curitiba, v. 46, p. 56 – 66.
- *Guerra, E.* (2010). Estratégias para Criação de Objetos Visando Modularidade (title translation: Strategies for Creating Objects Aiming for Modularity). MundoJ, Curitiba, v. 44, p. 6 – 15.
- *Guerra, E.* (2010) Avaliando Expressões com JBoss EL (title translation: Evaluating Expressions with JBoss EL). MundoJ, v.

42, p. 30 – 34.

- *Guerra, E.*, Perillo, R. (2010) Domain Annotations - Anotações Próximas ao Domínio da Sua Aplicação (title translation: Domain Annotations - Annotations Close to Your Application Domain). MundoJava, Curitiba, v. 41, p. 23 - 31.
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- *Guerra, E.*, Perillo, R. (2009) Aprendendo Padrões Java EE com uma História Interativa (title translation: Learning Java EE Patterns with an Interactive Story). MundoJava, Curitiba, v. 38, p. 18 – 37.
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Open-source Projects

The open-source projects listed here were developed directly by me or in projects by my supervision. Even if some of these projects are part of research studies, the software developed is a contribution by itself and can be used and adapted to real software projects.

Application Frameworks

- Greensfinge: The framework allows you to adjust resources in an efficient and personalized way, dynamically deactivating components that are not in use, without compromising existing behavior or business rules, integrating sustainability into the software in a simple and transparent way. Last update in 2025. https://github.com/EsfingeFramework/greensfinge
- Esfinge QueryBuilder: A framework that provides a unified metadata-based API for a persistence layer for several types of databases, supporting relational databases, MongoDB, Neo4J and Cassandra. Last update in 2025. https://github.com/EsfingeFramework/querybuilder
- Esfinge CNEXT: A framework to implement continuous experimentation at class and component level decoupled from the application. Last update in 2022. https://github.com/EsfingeFramework/experiments
- Esfinge Metadata: A framework that implements a novel API to be used by frameworks and components to read and consume code annotations. Last update in 2023. https://github.com/EsfingeFramework/metadata
- Esfinge AOM RoleMapper: A framework for applications that adopt the adaptive object model (AOM) architectural style, mapping it to static classes. Last update in 2020.

https://github.com/EsfingeFramework/aomrolemapper

- Esfinge Guardian: A metadata-based framework that provides an extensible solution for application access control. Last update in 2019.
  https://github.com/EsfingeFramework/guardian
- Esfinge Gamification: A framework to introduce gamification into an application decoupled from its business rules. Last update in 2019.
  https://github.com/EsfingeFramework/gamification
- Esfinge LiveProg: A live programming framework to allow swapping classes at runtime. Last update in 2018.
  https://github.com/EsfingeFramework/liveprog
- Esfinge Comparison: A framework that compare objects from the same class returning a list of their differences and allow the configuration of customized comparison for specific properties. Last update in 2023.
  https://github.com/EsfingeFramework/comparison
- Esfinge SystemGlue: A framework with a metadata-based approach that implements a plugin mechanism for different interfaces. Last update in 2016.
  https://github.com/EsfingeFramework/systemglue
- JColtrane: A metadata-based framework to parse XML files based on the SAX approach. Last update in 2009.
  http://jcoltrane.sourceforge.net/
- SwingBean: A framework that generates Swing UI components based on the class structure and metadata configuration. Last update in 2009.
  http://swingbean.sourceforge.net/

Test Frameworks

- Esfinge ClassMock: A test framework that generates classes at runtime to test classes and components based on reflection and annotations. Last update in 2022
  https://github.com/EsfingeFramework/ClassMock
- Esfinge ReTest: A test framework that provide code annotations for the test of classes and components with highly random algorithms. Last update in 2017.
  https://github.com/EsfingeFramework/ReTest

Software Development Tools

- ArchHypo.AI: A Trello plugin that integrates ArchHypo functionality, facilitating the management of hypotheses and architectural decisions using LLM directly within Trello cards. Last update in 2026.
  https://github.com/jonathancs-tester/ArchHypo-Trello-Plugin
- codƎEmoji: An Intellij Plugin that uses the concept of code augmentation to add emojis with additional semantics in the source code visualization. Last update in 2025.
  https://github.com/codeemoji/codeemoji-plugin
- Torii: A tool that implements an web-based implementation of a lean software analytics canvas. Last update in 2022.
  https://github.com/EsfingeFramework/torii-swanalyticscanvas
- Annotation Sniffer: A tool that collect code annotation metrics in

applications. Last update in 2022.
https://github.com/metaisbeta/asniffer

- AVisualizer: A tool for visualizing the distribution of code annotations in a software project. Last update in 2023.
https://github.com/metaisbeta/avisualizer
- Ecolyzer: A tool that aims to explore dependencies of software components from the point of view of a software ecosystem. Last update in 2021.
https://github.com/avancinirodrigo/ecolyzer
- Esfinge VirtualLab: A virtual lab platform with an API based on code annotations that load dynamically components and classes. Last update in 2019.
https://github.com/EsfingeFramework/virtual-lab
- Neutrino: Tool to automate the refactoring of test code independent of the test framework. Last update in 2018.
https://github.com/rmonico/Neutrino
- Chrysalis: A tool to refactor XML documents, supporting the migration of existing files among the versions. Last update in 2010.
https://code.google.com/archive/p/xmlrefactoring/

Organization of Community Events

- Open Data Hub Bootcamp (2024, 2025, 2026), initiative of the Open Data Hub together with the Free University of Bozen-Bolzano.
- Joint Seminar Unibz-Unitn, June 2024, Bolzano, an event with researchers from Unibz, Unitn, and external guests about topics in computer science. Funded by Euregio Mobility Fund.
- AgileVale – An event focused on Agile methods, target to practitioners at Instituto Tecnológico de Aeronáutica. (2010 as organizer – 440 registered, 330 present, 2011 as organizer – 900 registered, 550 present)

Presentations

Since 2016
(not including conference paper presentations and keynotes)

- 2025 - Empowering the End User to be More Sustainable in Web Applications – SFSCon 2025
- 2025 - Insegnare il Board Game Design – Un'Esperienza a UniBZ – Lucca Comics, Area talk
- 2025 - 20 Years of Code Annotations: What I learned and What's Next - Developer's Thursday at NOI Techpark
- 2025 - What my favorite movies can teach about agile? - Universidade do Estado do Rio Grande do Norte (UERN), Invited Talk, Brazil.
- 2025 – Matching the theme with your game mechanics – Invited talk in the Federal University of Juiz de Fora, Inova Talks, Brazil.
- 2025 – Towards Green Service APIs, Open Data Hub Day 2025.
- 2025 - What my favorite movies can teach about agile? (online) – Universidade Federal Rural do Semi-Árido (UFERSA), Invited talk, Brazil.
- 2025 – Emojis invade Programming, Science Slam @ Bruniko.
- 2024 – codEEmoji – Making code more informative with emojis, SFSCon 2024.
- 2024 - Jedi's Path to a Software Architecture that Evolves – Developer's Thursday at NOI Techpark
- 2024 – Interacting with Open Data Hub in Software Engineering Education at Unibz, Open Data Hub Day 2024.

- 2024 – Emojis invade Programming, Science Slam @ Bolzano, 2024.
- 2024 - What my favorite movies can teach about agile? – UFTPR, Invited talk, Brazil.
- 2024 - Design Challenges in the context of the Open Data Hub - Developer's Thursday at NOI Techpark (with Master students)
- 2023 - Using Hypothesis Engineering to Manage the Software Architecture Evolution in an Environment with Uncertain Requirements (tutorial) - ICSOB 2023
- 2023 - Pitfalls and Mistakes When Dealing With Non-Functional Requirements- SFSCon 2023
- 2023 - Supporting Open Data in Large Systems: principles and practices of extensibility in microservices – Open Data Hub Day at NOI Techpark
- 2023 - Between guessing and random metrics: software analytics to the rescue! - Developer's Thursday at NOI Techpark
- 2022 - Sustaining the Software Architecture - Techniques to manage the architecture evolution in an agile project - SFSCon 2022
- 2022 - Lean Analytics Canvas for Decision-Making in Software Projects (tutorial) - ICSOB 2022
- 2022 – What my favorite movies can teach about agile? – Developer's Thursday at NOI Techpark
- 2021 - A Lean Software Analytics Canvas for Agile Small Teams - Actually using metrics for making meaningful decisions - SFSCon 2021
- 2021 - Agile Software Architecture Practices - Seminar in the Brunel Software Engineering Lab (BSEL)
- 2019 - A Metrics Suite for code annotation assessment. Journal-First Track - ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM).
- 2019 - An Approach for Applying Test-Driven Development (TDD) in the Development of Randomized Algorithms. Journal-First Track - Brazilian Symposium on Software Engineering (SBES).
- 2019 – Practices for an Evolutionary and Sustainable Architecture (in Portuguese: Práticas para Arquitetura Evolutiva e Sustentável). Agile Trends (event focused on software development industry) – Workshop Teams Track. Accepted for presentation.
- 2018 – Panel: Software Engineering vs. Data Science: Challenges and Patterns. IX Brazilian Conference on Software: Theory and Practice (CBSoft 2018) – Industry Track. Invited panelist.
- 2018 – Decisions based on guessing? Meet Software Analytics (in Portuguese: Decisões baseadas em "achômetro"? Conheça Software Analytics!) - Agile Trends (event focused on software development industry) – Agile Testing and Quality Track. Invited talk.
- 2017 – Pattern Writing Dojo. Mini Latin American Conference on Pattern Languages of Programming – Mini SugarLoafPLoP 2017 colocated with Smalltalk 2017. Invited Workshop.

Published Games *In the role of game designer*	• *Guerra, E., Pomper, E., Reis, E.* (2025) Guardians Super Force, Jelly Monster (publisher), 3DUS (studio), Brazil. https://ludopedia.com.br/jogo/formula-pop • *Guerra, E., Pomper, E., Reis, E.* (2025) Formula POP, Jelly Monster (publisher), 3DUS (studio), Brazil. https://ludopedia.com.br/jogo/guardian-super-force • *Guerra, E.* (2023) Breaking News. Salto, Italy. https://boardgamegeek.com/boardgame/419471/breaking-news • *Guerra, E.*, de Moraes, D. (2020) Revolta em San Villano. Dijon Jogos, print-and-play, Brazil. https://dijonjogos.com.br/produto/revolta-em-san-villano/ • *Guerra, E.* (2019) Heróis de San Villano. Dijon Jogos, 1st print, Brazil. https://dijonjogos.com.br/produto/herois-de-san-villano/ • *Guerra, E.* (2018) Crop Rotation: Bug Plague. Legião Jogos, 1st print, Brazil.. https://ludopedia.com.br/jogo/crop-rotation-bug-plague • *Guerra, E.* (2017) Enchanted Cubes. The Game maker, print-on-demand, Brazil.. https://ludopedia.com.br/jogo/enchanted-cubes • *Guerra, E.* (2016) Crop Rotation. Studio Teia de Jogos, print-and-play, Brazil.. https://boardgamegeek.com/boardgame/219661/crop-rotation
Other activities	• Member of a group called Saber Guild that participate in cultural events in Italy by invitation. As an example, the group was invited several times to events like Play Muse (from Trento Museum), Rovereto Comics and Pergine Comics. • From 2018 to 2020, I was the president of the "START Teen Programming Club" where kids from 9 to 16 gather to develop projects about digital games and software applications. • I have a personal YouTube channel where I post videos with classes in Portuguese about agile software development, object-oriented programing, frameworks development and software patterns - https://www.youtube.com/user/eduardomg23/videos. • I participate in a YouTube channel in Portuguese with videos about board games and board game design - https://www.youtube.com/@3DUsjogos .

Date: 06/03/2026   Signature