Journal of the Brazilian Computer Society, 2026, 32:1, doi: 10.5753/jbcs.2026.8350

Graphs and Algorithms celebrating a fifty-year landmark

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Received: 27 May 2026 • **Accepted:** 02 June 2026 • **Published:** 16 June 2026

Abstract Landmarks are important and yet hard to celebrate. We have the privilege of witnessing Jayme Luiz Szwarcfiter reach 48 supervised doctoral theses as we celebrate the 50th anniversary of his own doctoral degree. The past five decades have witnessed the birth and growth of a vibrant research community on Graphs and Algorithms in Brazil, covering both the diversity of themes and the diversity of regions of our continental country. Jayme has acted as a key catalyst in articulating collaborations beyond the regions of Brazil to reach Argentina, Mexico, and Chile. He has fostered regional and international collaboration and helped consolidate different research groups in Latin America. On this landmark occasion, we describe some of the noteworthy achievements of our community, with special attention to Professor Szwarcfiter's role.

Keywords: Graph theory, graph algorithms, computational complexity of graph problems, design and analysis of algorithms, combinatorial optimization

1 Honoring Jayme Luiz Szwarcfiter's landmarks

Jayme Luiz Szwarcfiter is a Brazilian pioneer in computer science who, since his doctoral years, has been successful in forging collaborations, producing papers that are milestones in the history of Brazilian science, and fostering generations of researchers throughout Latin America.

Jayme's first journal paper [Knuth and Szwarcfiter, 1974], written during his doctoral years in the UK, was published in *Information Processing Letters* in coauthorship with Donald Knuth, considered by many the father of the analysis of algorithms. In that same year, Knuth received the ACM Turing Award, considered the Nobel Prize of computer science. During his postdoctoral studies at the University of California, Jayme collaborated with Christos Papadimitriou, a foundational figure in theoretical computer science, author of the textbook on computational complexity [Papadimitriou, 1994] that for decades was considered the definitive graduate-level book on the topic. Alon Itai was a visiting lecturer and the three of them collaborated in a *SIAM Journal on Computing* paper [Itai *et al*., 1982], obtaining one of the most important NP-complete restricted versions of the Traveling Salesman Problem. Jayme's subsequent long-term research visit at Université Paris XI sowed the seeds of the continued strong collaboration between Brazil and France, which is the basis of the Latin American Algorithms, Graphs, and Optimization Symposium series: its first edition was a joint School on Algorithms and Combinatorics sponsored by the International Center for Pure and Applied Mathematics (CIMPA) to promote mathematical research in developing countries.

Jayme Luiz Szwarcfiter received in 2000 the prestigious Admiral Álvaro Alberto Award for Science and Technology. This award is a partnership between the Ministry of Science, Technology, and Innovation (MCTI), the National Council for Scientific and Technological Development (CNPq), and the Brazilian Navy. It recognizes and encourages Brazilian researchers who have made significant contributions to the country's science and technology. Since its inception in 1982, only three researchers have received the award in the area of computer science. Jayme exceptionally first received the main award for Brazilian Science and Technology, even before receiving other prestigious awards, among them the Scientific Merit Award given by the Brazilian Computer Society and election to the Brazilian Academy of Sciences.

In 2002, in honor of Jayme's 60th birthday, the *Journal of the Brazilian Computer Society* published a special issue [de Figueiredo and Barbosa, 2002] comprising contributions from several influential members of the international community in the areas of theoretical computer science and discrete mathematics, including former collaborators and students of Jayme's. Cláudio Lucchesi gave an account of Jayme's contributions to Graph Theory and Computer Science [Lucchesi, 2002].

In 2012, the *Journal of the Brazilian Computer Society* published a special issue [de Oliveira, 2012] dedicated to full papers selected from those presented at the Fourth Latin-American Workshop on Cliques in Graphs. In the occasion, Lucchesi's 2002 article was reprinted, and two reasons were mentioned by the editor-in-chief for reprinting: the original print truncated the final two pages of the article, and in celebration of Jayme's 70th birthday as an acknowledgment of his continuing important contributions to the field.

In 2022, in honor of his 80th birthday, a collection of 14 short papers was published in a *Cadernos do IME* special issue [de Souza Oliveira and dos Santos, 2022]. Former students and colleagues coauthored survey-like personal accounts of their work with Jayme.

Since 2002, Jayme's academic footprint has expanded dramatically: the 44 publications and 16 advised doctoral theses

recorded in 2002 have since grown to 179 and 48, respectively (see Appendix A). It is fitting that to mark the occasion of the 50th anniversary of Jayme's doctoral degree, a review of his noteworthy achievements in the field of Graphs and Algorithms is presented here, summarizing his activity to foster the integration of the scientific community in our country and his important role in the integration of the Latin American scientific communities, through collaboration with many researchers from different countries, where his influence extends to several generations of students and is enhanced by several textbooks, surveys and monographs.

This introductory section is followed by a historical perspective through books in Section 2, the foundation of Graphs and Algorithms regional conferences in Section 3, and a legacy of nearly 50 theses in Section 4. We conclude by acknowledging the enduring inspiration of our professors Knuth and Szwarcfiter, collaborators on a paper from fifty years ago who are keen to revise their views on AI models and data science. An appendix contains the full list of theses supervised by Jayme Luiz Szwarcfiter.

2 A historical perspective through books

The evolution of theoretical computer science in Brazil since the 1970s is a narrative of intellectual maturation that has transformed the country into an international protagonist, in particular in the fields of graph algorithms, combinatorics and optimization. In this section, we review the influential literature produced by Brazilian researchers, with a focus on those fields, contextualizing Jayme's contribution through his books. We do not mean to be exhaustive, leaving out, for example, research oriented books, such as the recent *Perfect Matchings: A Theory of Matching Covered Graphs* by Lucchesi and Murty [2024].

The formalization of the computational structures and methods received its first major foundation in Brazil in the work *Aspectos Teóricos da Computação* [Simon *et al*., 1979] by Imre Simon, Istvan Simon, Janos Simon, Cláudio Lucchesi, and Tomasz Kowaltowski. This seminal book systematized concepts of formal languages, decidability, and complexity, becoming the first reference in theoretical computer science for the Brazilian community.

A few year later, Routo Terada made a key contribution with the publication of *Desenvolvimento de Algoritmos e Complexidade de Computação* [Terada, 1982], one of the first works in Brazil to treat complexity classes and the design of efficient algorithms in a structured way, paving the way for the rigorous study of computational efficiency. Complementing this theoretical base, the availability of literature focused on organizing structured data advanced significantly with the publication of *Estruturas de Dados* [Veloso *et al*., 1983] by Paulo Veloso, Clesio dos Santos, Paulo Azeredo, and Antonio Furtado — an essential work for consolidating the teaching of abstract data types and information management.

As the 1980s progressed, Jayme was a key figure in bringing prominence to the field of graphs and algorithms for dealing with them efficiently, notably with the release of his book *Grafos e Algoritmos Computacionais* [Szwarcfiter, 1983], fully revised as *Teoria Computacional de Grafos: Os Algoritmos* [Szwarcfiter, 2018]. Szwarcfiter's books played a fundamental role in shaping computer science education in Brazil, offering deep mathematical and algorithmic treatment to problems on graphs. This excellence was definitively brought to undergraduate and graduate education when Szwarcfiter, in partnership with Lilian Markenzon, published *Estruturas de Dados e seus Algoritmos* [Szwarcfiter and Markenzon, 1994]. This book became ubiquitous in Brazilian universities, recognized for its clarity in explaining complexity analysis and the implementation of fundamental algorithms. At the same time, Paulo Boaventura Netto expanded these frontiers with *Grafos: Teoria, Modelos, Algoritmos* [Netto, 1996], which focused on applying these models to engineering and logistics problems, providing a practical and multidisciplinary character to graph theory. Simultaneously, the textbook *An Introduction to Distributed Algorithms* [Barbosa, 1996] by Valmir Barbosa played a key role in popularizing the field of distributed algorithms in university curricula.

In the field of optimization and hard problems, the influence of Nelson Maculan was decisive in integrating Operations Research with Computer Science in a much stronger way than in most countries, with repercussions on the composition of Computer Science departments even to the present day. A fundamental milestone of this effort was the book *Algoritmos e Heurísticas: Desenvolvimento e Avaliação de Performance* [Maculan and Campello, 1994], in partnership with Ruy Eduardo Campello. This work filled a significant gap by addressing the construction of methods for complex combinatorial problems and the scientific methodology for evaluating the performance of these algorithms. This branch also relied on the rigor of Yoshiko Wakabayashi, who published the book *Combinatória Poliédrica e Planos-De-Corte Faciais* [Wakabayashi and Ferreira, 1996] in co-authorship with Carlos Eduardo Ferreira. This work consolidated the study of advanced optimization techniques and polyhedral approaches in the national scene, placing Brazilian research at the frontier of that area.

Once they had matured, foundational concepts were soon applied in strategic areas, as seen in the later work of Routo Terada, *Segurança de Dados: Criptografia em Rede de Computadores* [Terada, 2000]. By using complexity theory to ground digital security, Terada demonstrated that the trajectory initiated by the logical foundations of Paulo Veloso, the combinatorial foundations of the Simon brothers, Lucchesi, and Kowaltowski, and the fundamentals of cryptography [Lucchesi, 1986] had reached full technological maturity.

Furthermore, computer science education in Brazil was revitalized by several new books. *Uma Introdução Sucinta à Teoria dos Grafos* [Feofiloff *et al*., 2004], by Yoshiko Wakabayashi, Paulo Feofiloff, and Yoshiharu Kohayakawa, brought a modern and precise approach to teaching the subject, rapidly becoming a contemporary reference. *Combinatória* [Botler *et al*., 2021], by Fábio Botler, Maurício Collares, Taísa Martins, Walner Mendonça, Rob Morris, and Guilherme Oliveira Mota, gave special focus to the areas of extremal and probabilistic combinatorics, which have shown steady growth and relevance in the past three decades, putting Brazil as a powerhouse on the topic. *Números Inteiros e Criptografia RSA* [Coutinho, 1997], by Severino Collier Coutinho,

is an elementary introduction to one of the most popular cryptographic methods currently available and to the classical mathematics that underlies it, number theory. Moreover, *Introdução aos Fundamentos da Computação: Linguagens e Máquinas* [Vieira, 2006], by Newton José Vieira, is an essential reference for the study of formal languages, automata theory, and computability. This expansion moved to recent trends, exemplified by *Ciência de dados: Algoritmos e Aplicações* [Faria *et al*., 2021], by Luerbio Faria, Fabiano de Souza Oliveira, Paulo Eustáquio Duarte Pinto, and Jayme Luiz Szwarcfiter. This book demonstrates how the solid foundation in algorithms and graphs built in the last century now supports the analysis of large volumes of data and artificial intelligence. This proliferation of specialized titles demonstrates that, after the year 2000, Brazil not only had consolidated its theoretical base but also began to map the most complex frontiers of computing with a large bibliographic production.

It is worth mentioning that the quality of those texts was also recognized by the scientific societies. The Elon Lages Lima Prize, jointly established by the Brazilian Society of Applied and Computational Mathematics (SBMAC) and the Brazilian Mathematical Society (SBM), aims to promote and encourage national bibliographic production in mathematics and applications, dedicated to the training and dissemination of knowledge in the field. In 2019, in its first edition, the prize was given to *Teoria Computacional de Grafos: Os Algoritmos* [Szwarcfiter, 2018]. In 2023, the prize was given to *Combinatória* [Botler *et al*., 2021].

In addition to these influential textbooks, other materials significantly impacted the dissemination of new trends, techniques, and research topics within the computer science community. Minicourses were presented in many editions of the Escola de Computação and the Jornada de Atualização em Informática (JAI), both promoted by the Brazilian Computer Society (SBC) and paired with accompanying texts, which remain relevant didactic material to the present day. On many occasions, the theoretical computer science community has been present in these events, including at least one course in all twelve editions of the Escola de Computação (from 1979 to 2000), venues where early drafts of several foundational textbooks were first sketched. Jayme's contribution, in the third edition of the *Escola*, in 1982, was the course *Algoritmos em Grafos: uma Introdução*. The community has also been present on several JAI editions, with courses such as *Coloração em Grafos* [de Figueiredo *et al*., 1997]; *Emparelhamentos em Grafos: Algoritmos e Complexidade* [de Figueiredo and Szwarcfiter, 1999]; *Introdução à Otimização Combinatória* [Miyazawa and de Souza, 2015]; *Uma Introdução à Complexidade Parametrizada* [dos Santos and Souza, 2015]; *Teoria da Computação: Uma Introdução à Complexidade e à Lógica Computacional* [de Figueiredo and Lamb, 2015], just to cite a few titles.

In the mathematics community, similar initiatives have been promoted. The Brazilian Mathematical Colloquium has been organized by IMPA every two years since 1957 and is the most important event in the Brazilian mathematics calendar. The event has advanced and introductory courses, where graphs and algorithms have often been present. One of such courses, dating from the same year of the foundational textbook of Simon *et al*. [1979], is *Introdução à Teoria dos Grafos* [Lucchesi, 1979]. In addition to those already mentioned, recent works include *Uma Introdução Sucinta a Algoritmos de Aproximação* [Carvalho *et al*., 2001]; *Introdução aos Algoritmos Randomizados* [de Figueiredo *et al*., 2007]; *Uma Introdução à Convexidade em Grafos* [Araújo *et al*., 2023]; *Paths and Connectivity in Temporal Graphs* [Marino and Silva, 2023]; *Teoria dos Jogos Combinatórios em Grafos* [Araújo *et al*., 2025]. The National Congress of Applied and Computational Mathematics is the main annual event promoted since 1978 by SBMAC. Minicourses are presented giving rise to texts, for instance, *Introdução à Teoria Espectral de Grafos com Aplicações* [Abreu *et al*., 2012]. Also, the international SBMAC SpringerBriefs in Mathematics series features texts in English, for instance *Locating Eigenvalues in Graphs* [Hoppen *et al*., 2022].

3 The founding of Graphs and Algorithms regional conferences

To show how Graphs and Algorithms research themes and groups have evolved in Brazil along the years, we discuss here the Brazilian and Latin American conferences and workshops LATIN, LAGOS, LAWCG, ETC, and WBC. Jayme's instrumental and active roles were followed by the effort of younger researchers in fostering a connected community in the region.

LATIN The Latin American Theoretical INformatics Symposium started in 1992 and is held every two years since 1998; it is currently in its 17th edition. Since its first edition, Jayme has actively collaborated with the event as program committee member and as author of accepted papers. The papers published in LATIN come from nearly 50 countries and about 15% of these have an author with a Latin American affiliation and 8% have all their authors affiliated to Latin American institutions. Many other articles are written by the Latin American diaspora working mostly in Europe and North America. In terms of worldwide reach measured by the origin of accepted papers, the top 10 come from the United States, France, and Germany, and is complemented by Canada, Brazil, Chile, Italy, the United Kingdom, Israel, and Switzerland. Among the strong research areas for which LATIN is a natural venue are algorithms, computational complexity, data structures, pattern matching, and random structures. Its proceedings are first published in Lecture Notes in Computer Science, followed by a special issue with selected full papers of the journals *Algorithmica* or *Theoretical Computer Science*. Another distinctive aspect of the symposium is its relatively large lineup of invited speakers who are ACM Fellows, ACM Turing Award and Nevanlinna Prize recipients. Although LATIN keeps its Latin American nature, it is a meeting that reaches the world. The official website of the conference is `http://www.latintcs.org`.

LAGOS The Latin American Algorithms, Graphs and Optimization Symposium started in 2001 and is currently in its

13th edition. Please visit `http://lagos.mat.br`. It has been held in Brazil, Chile, Argentina, and Mexico. Exceptionally, LAGOS 2017 was held in France, a Latin country that has always collaborated with, and helped develop science in Latin American countries. LAGOS 2017 celebrated the combined 150th birthday of its Emeritus Steering Committee members Jayme Szwarcfiter and Thomas Liebling. Among the strong research areas for which LAGOS is natural venue are algorithms and complexity, operations research and mathematical programming, graph theory, combinatorial geometry, and applications to real-world problems. Its proceedings were first published in *Electronic Notes in Discrete Mathematics*, then in *Electronic Notes in Theoretical Computer Science*, and nowadays in *Procedia Computer Science*, followed by a special issue of *Discrete Applied Mathematics* with selected full papers. Another distinctive aspect of the symposium is its selection of invited speakers. In the first edition of LAGOS in 2001 W. T. Tutte gave, in one of his last talks, a historical account of his role as a code breaker and mathematician during the Second World War. LAGOS 2011 featured special talks by the authors of the landmark paper, "Ellipsoid Method and its Consequences in Combinatorial Optimization" by M. Grötschel, L. Lovász, A. Schrijver, on its 30th anniversary. Each edition of LAGOS attracts authors from approximately 20 distinct countries. Outside Latin America, the largest number of submissions and participants are affiliated with French institutions.

LAWCG The Latin American Workshop on Cliques in Graphs is meant to foster interaction among the Latin American graph theory and combinatorics researchers, whose interests include cliques, clique graphs, the behavior of cliques and related issues. The first edition in 2002 was held in honor of Jayme's 60th birthday, having as invited speaker Víctor Neumann-Lara, the pioneer in the field of graph theory in Mexico. To celebrate Jayme's 70th birthday, Pavol Hell, the editor-in-chief of the *Journal of Graph Theory*, gave a special talk. Michael Fellows, recognized as one of the founders of parameterized complexity, gave an invited talk at LAWCG 2014, acknowledging that Jayme had supervised the first thesis in the subject in Brazil. LAWCG is currently in its 12th edition, to be held in Águas de Lindóia, Brazil. Its previous editions were held in Brazil, Argentina, and Mexico. More information is available at `http://www.lawcg.mat.br`. In all editions, the participants of the conference have been invited to submit an extended abstract describing their contributions to *Matemática Contemporânea*, a journal of the Brazilian Mathematical Society.

ETC The Encontro de Teoria da Computação is a forum focused on the general field of theoretical computer science, proposed by the Comissão Especial de Algoritmos, Combinatória e Otimização (CE-ACO), a thematic committee of SBC. The aim is promoting greater dissemination of the field to the Brazilian computing community and related fields, with the purpose of integrating and bringing researchers in the field, through CSBC, the main annual event of the Brazilian Computer Society. ETC started in 2016 and is currently in its 11th edition. While primarily aimed at student papers, the meeting also seeks to foster deeper integration between researchers and professionals working in the field, whether focusing on theory or applications, stimulating discussion of the importance of the fundamentals of computing and their direct application in understanding and solving problems in the most diverse areas and market segments. Jayme has been instrumental actively collaborating with the event since its inception, being one of its most active authors. For more information, please visit `http://sites.google.com/view/ceaco-sbc/etc`.

WBC With the purpose of fostering the advancement of Combinatorics in Brazil, two alternating events were created, the Brazilian Combinatorics Workshop (WBC) and the Brazilian School of Combinatorics (EBC). The workshop promotes a highly immersive academic environment. The series is designed to integrate excellent teaching with cutting-edge research, facilitating strategic cooperation between students and researchers. The program combines introductory mini-courses, aimed at undergraduate and graduate students, plenary lectures on contemporary topics, and collaborative research sessions. In these sessions, the focus is on the joint resolution of problems and conjectures, stimulating the development of innovative methods and strengthening the national scientific network. The workshop takes place biannually, alternating with the Brazilian School of Combinatorics. Please visit `http://wbc2024.ufba.br` for the first edition of WBC.

Outward influence The continuous organization of several national meetings allowed many research groups to flourish covering a diversity of regions in Brazil. Jayme's continuous leadership in organizing regional meetings contributed to the presence of Brazilian researchers in the program committee of international conferences and in the editorial board of international journals. There have been Brazilian researchers in the committees of the International Workshop on Combinatorial Algorithms (IWOCA), International Symposium on Fundamentals of Computation Theory (FCT), Mathematical Foundations of Computer Science (MFCS), and International Workshop on Graph-Theoretic Concepts in Computer Science (WG); and in the editorial board of *RAIRO Operations Research*, *Acta Informatica*, *Discrete Mathematics and Theoretical Computer Science*, *Theoretical Computer Science*, *Journal of Computer and System Sciences*, and *Networks*.

4 A legacy of nearly fifty theses

We have listed in the appendix the 48 theses supervised by Jayme from 1983 until 2024. Figure 1 shows a diagram where we can appreciate how the theses are distributed. The theses are well distributed over the years, with just a few gaps.

The titles highlight frequent themes such as posets, intersection graphs, clique graphs, algorithms for structured graph classes, the Helly property, graph convexity, scheduling, parameterized complexity, and data compression. The themes are characterized by the search for mathematical properties that help determining efficient algorithms for solving combinatorial problems, investigating a two-way research path: how mathematics is a vehicle for finding efficient algorithms

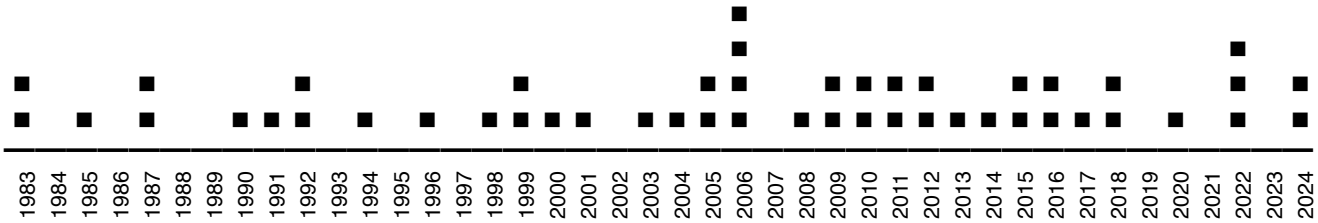

Figure 1. Timeline of the 48 theses supervised by Jayme Luiz Szwarcfiter.

and how the analysis of efficient algorithms unearths nice mathematical properties.

In order to gather information on new themes, first at UFRJ, Jayme organized several schools, where he invited leading researchers who inspired Jayme's students to pursue research on different subjects: "Escola de Grafos Perfeitos" in 1991, "Escola de Ordens" in 1994, and "Escola de Planejamentos Combinatórios" in 2000; followed by courses given by Jayme at regional conferences to invite students around Latin America to pursue graduate studies under his supervision, for instance: "A Survey on Partially Ordered Sets" at the IX Escola Latino Americana de Investigación Operativa in Argentina in 2003. As a result, several surveys were written by Jayme and by his colleagues and former students: *Triangulated graphs: A survey* [Villanueva and Szwarcfiter, 1992]; *A survey on clique graphs* [Szwarcfiter, 2003]; *Computational aspects of the Helly property: A survey* [Dourado *et al*., 2006]; *Characterizations and recognition of circular-arc graphs and subclasses: A survey* [Lin and Szwarcfiter, 2009]; *The interval count of interval graphs and orders: A short survey* [Cerioli *et al*., 2011].

It is remarkable that among his 30 master students, 20 of them have pursued a doctoral degree, 12 of those under Jayme's supervision.

The ability to train researchers is evident from the large number of theses, more than half of which have been co-supervised in collaboration with Jayme's former students. Although we are able to find 140 theses supervised by Jayme's former doctoral students, due to the strong collaboration in co-supervising theses, it is hard to exactly measure the significant impact of Jayme's legacy.

5 AI models and Data Science

In a short note titled "Claude's Cycles," Knuth recounts how an AI model produced a general construction for a combinatorial graph problem that had resisted his own efforts for decades. The problem involved decomposing a highly structured 3-dimensional directed graph into cycles—one of those deceptively simple questions that quickly become intractable as size grows. Knuth had solved only the smallest cases and suspected a general solution might exist for odd dimensions—but he never found a construction. The AI did. What makes this remarkable is not speed or brute force. The model didn't just compute; it reframed the problem, explored patterns across many failed attempts, recognized hidden structure, and eventually generated an explicit algorithmic construction that works in the general odd-dimensional case. Knuth verified the result, refined it, and documented it himself [Knuth, 2026].

At the 33rd Brazilian Mathematical Colloquium, the most comprehensive scientific meeting of the Brazilian mathematical community, Jayme presented, with his coauthors at the State University of Rio de Janeiro, his latest book [Faria *et al*., 2021]. The text presents data science content taking into account its applications, maintaining an emphasis on algorithms throughout the exposition. Naturally, the concern for the mathematical rigor necessary to address the various aspects of the subject agrees with his several previous books.

Our great Professors Knuth and Szwarcfiter, coauthors fifty years ago [Knuth and Szwarcfiter, 1974] in a milestone paper in the history of Brazilian science, keep up with technological challenges and set a valuable example of the importance of the theoretical foundations. The revolution on technology and science asks for interaction of mathematics and computation through their foundations.

Declarations

Acknowledgements

The authors are grateful to the Editors-in-Chief of the *Journal of the Brazilian Computer Society* for supporting our proposal of a landmark paper.

Competing interests

The authors declare no competing interests.

Funding

This research was supported by the funding agencies CAPES, CNPq, FAPERJ, and FAPEMIG.

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A 48 theses supervised by Jayme Luiz Szwarcfiter

The following list of 48 theses supervised by Jayme Luiz Szwarcfiter from 1983 until 2024 shows his presence at a diversity of graduate programs located in Rio de Janeiro and in Argentina: doctoral degree in Systems and Computer Engineering "Doutorado em Engenharia de Sistemas e Computação" at PESC-UFRJ, doctoral degree in Informatics "Doutorado em Informática" at IC-UFRJ, doctoral degree in Mathematics "Doutorado em Matemática" at IM-UFRJ, doctoral degree in Computational Modeling "Doutorado em Modelagem Computacional" at IME-UERJ, doctoral degree in Mathematics "Doutorado em Matemática" at DM-UNLP, and doctoral degree in Computing "Doutorado em Computación" at DC-UBA.

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3. Isac Mendes Lacerda. Análise Empírica de Algoritmos para Escalonamento de Projetos com Maximização do Valor Presente Líquido. 2022. Doutorado em Informática, Universidade Federal do Rio de Janeiro. Co-advised with Rosiane de Freitas Rodrigues
4. Bruno Porto Masquio. Connected and Disconnected Matchings. 2022. Doutorado em Modelagem Computacional, Universidade do Estado do Rio de Janeiro. Co-advised with Paulo Eustáquio Duarte Pinto.
5. Moysés da Silva Sampaio Júnior. Precedence Thinness of Graphs and Restricted Hamming-Huffman Trees. 2022. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro. Co-advised with Fabiano de Souza Oliveira.
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7. Natália Pedroza de Souza. Sobre Códigos de Hamming de Distância 3. 2018. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro. Co-advised with Paulo Eustáquio Duarte Pinto.
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9. Carlos Vinicius Gomes Costa. Complexity and Algorithms Related to Two Classes of Graph Problems. 2017. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro. Co-advised with Mitre Costa Dourado.
10. Rodrigo dos Santos Veloso Martins. Random Mappings and Polynomials over Finite Fields. 2016. Doutorado em Informática, Universidade Federal do Rio de Janeiro.
11. Moises Teles Carvalho Junior. O Número de Helly na Convexidade Geodética em Grafos. 2016. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro. Co-advised with Mitre Costa Dourado.
12. Lucila Maria de Souza Bento. Marcas d'Água Baseadas em Grafos para Proteção de Software. 2015. Doutorado em Informática, Universidade Federal do Rio de Janeiro. Co-advised with Vinícius Gusmão Pereira de Sá.
13. Pedro Demasi. Heurísticas Baseadas em Apostas para Problemas de Otimização Combinatória. 2015. Doutorado em Informática, Universidade Federal do Rio de Janeiro.
14. Alexandre Toman. O Número de Radon em Grafos. 2014. Doutorado em Informática, Universidade Federal do Rio de Janeiro. Co-advised with Mitre Costa Dourado.
15. Vinicius Fernandes dos Santos. Convexidades em Grafos: Intermediações, Parâmetros e Conversões. 2013. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro.
16. Carmen Cecília Centeno. Sobre a Convexidade P_3 para Grafos não Direcionados. 2012. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro. Co-advised with Mitre Costa Dourado.
17. Érika Morais Martins. Propriedade de Helly Colorida. 2012. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro. Co-advised with Rommel Melgaço Barbosa.
18. Fabiano de Souza Oliveira. Sobre Ordens e Grafos de Intervalo. 2011. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro. Co-advised with Marcia Rosana Cerioli.
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21. Adriana Figueiredo Pimenta. Sobre o Número de Saltos em Ordens Parciais. 2010. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro. Co-advised with Sulamita Klein.
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24. Maise Dantas da Silva. Complexidade Parametrizada de Problemas de Edição de Grupos. 2008. Doutorado em Engenharia de Sistemas e Computação, Universidade Federal do Rio de Janeiro. Co-advised with Fabio Protti.
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