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PANORAMA OF BRAZILIAN PUBLICATIONS AT THE 20TH INTERNATIONAL ERGONOMICS CONGRESS - THE RELEVANCE OF EXCHANGES AMONG SCIENTIFIC EFFORTS FOR ERGONOMICS

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ABSTRACT

This study aimed to identify the contribution of Brazilian researchers in Ergonomics and Human Factors at the 20th Congress of the International Ergonomics Association (IEA 2018). For that, a bibliometric research was carried out in the 10 volumes of the congress' annals. A total of 108 studies were identified with at least one author linked to a Brazilian institution and a total of 281 researchers involved in the research. The thematic area with the largest number of publications (44) was "Ergonomics in Design, Design for All, Activity Theories for Work Analysis and Design, Affective Design". In addition, 73 studies made a practical contribution with focus on analysis. The physical approach was addressed by 48 studies, while cognitive by 32 and organizational by 39. Tracing an overview of Brazilian contributions on the international stage allows to identify the areas explored, the possibilities for exchange between existing and future scientific efforts.

KEYWORDS: Ergonomics, Research, Brazil.

1. INTRODUCTION

Information plays a fundamental role in scientific research, serving as a key driver for changes in work methods and technologies when combined with raw materials and capital (Queiroz et al., 2015). This fact was emphasized at the 20th Congress of the International Ergonomics Association (IEA 2018), one of the main events in the field of Ergonomics and Human Factors, held in August 2018. This event provides an opportunity for a large and diverse community of scientists and professionals in the field to exchange research results and best practices, discussing and identifying important issues regarding the current state and future of the community (Bagnara et al., 2018), as well as the present event.

In 2018, over 1,643 papers were submitted to IEA 2018, with 1,010 selected from 80 countries. Nearly half of these papers were from Europe, with the remainder from other continents, with Asia being the most numerous, followed by South America, North America, Oceania, and Africa (Bagnara et al., 2018). Brazil was represented by 108 papers, being the most numerous among the countries in South America.

However, assuming that knowledge derived from verified information is devoid of problems and a greater need for investigation does not reflect the reality of academic research (Chueke & Amatucci, 2015). This is because the advancement of humanity constantly poses challenges to the field of scientific research. The perspective after the XX IEA reinforces the need for creativity to face new challenges. Upon reviewing the published works, one can perceive an atmosphere where there are not many well-established certainties, but rather an abundance of doubts and open questions (Bagnara et al., 2018).

To address these needs, researchers must rely on previous knowledge to advance the process of generating new knowledge and thereby promote the development of solutions and innovations relevant to identified and constantly changing demands. Bibliometric studies are an important tool to assist in this process. Bibliometrics seeks to study the production of articles in a certain field of knowledge, mapping academic communities and identifying networks of researchers and their motivations (Chueke & Amatucci, 2015).

Recognizing this relevance, this article aims to identify the contribution of Brazilian researchers in Ergonomics and Human Factors at IEA 2018, based on the Proceedings of the event. It is understood that the papers published at such an event offer a significant overview of the study methods and practices of Ergonomics in Brazil, and their analysis will elucidate important paths to be followed and possible partnerships to be established.

2. WORKING METHOD

The present study is characterized as a bibliometric study (Marconi & Lakatos, 2009), in which a research was conducted regarding the works of Brazilian researchers in the Proceedings of the 20th International Ergonomics Congress (IEA 2018). The Proceedings of the mentioned event consist of 10 volumes, titled according to Figure 1. The search criterion established was the country of the institution to which the authors are affiliated, regardless of their hierarchy in the authorship of the work.

Figure 1: Themes of the Proceedings of the 20th International Ergonomics Congress

Vol.	**Title**	**ISBN**	**N° of articles**
I	*Healthcare Ergonomics*	ISBN 978-3-319-96097-5	6
II	*Safety and Health and Slips, Trips and Falls*	ISBN 978-3-319-96088-3	10
III	*Musculoskeletal Disorders*	ISBN 978-3-319-96082-1	6
IV	*Organizational Design and Management (ODAM), Professional Affairs, Forensic*	ISBN 978-3-319-96079-1	11
V	*Human Simulation and Virtual Environments, Work with Computing Systems (WWCS), Process control*	ISBN 978-3-319-96076-0	3

VI	*Transport Ergonomics and Human Factors (TEHF), Aerospace Human Factors and Ergonomics*	ISBN 978-3-319-96073-9	6
VII	*Ergonomics in Design, Design for All, Activity Theories for Work Analysis and Design, Affective Design*	ISBN 978-3-319-96070-8	44
VIII	*Ergonomics and Human Factors in Manufacturing, Agriculture, Building and Construction, Sustainable development and Mining*	ISBN 978-3-319-96067-8	17
IX	*Aging, Gender and Work, Anthropometry, Ergonomics for Children and Educational Environments*	ISBN 978-3-319-96064-7	4
X	*Auditory and Vocal Ergonomics, Visual Ergonomics, Psychophysiology in Ergonomics, Ergonomics in Advanced Imaging*	ISBN 978-3-319-96058-6	1

The final result of the selection is found in a database composed of 108 articles (Appendix A) related to the thematic areas that title the volumes of the Proceedings. The articles described in the mentioned appendix are coded to facilitate their reference throughout this work. These articles include Brazilian researchers regardless of their authorship hierarchy. Thus, articles where the first author is of another nationality were also included, as we believe that the exchange between institutions is also indicative of how Brazilian researchers have positioned themselves within the field.

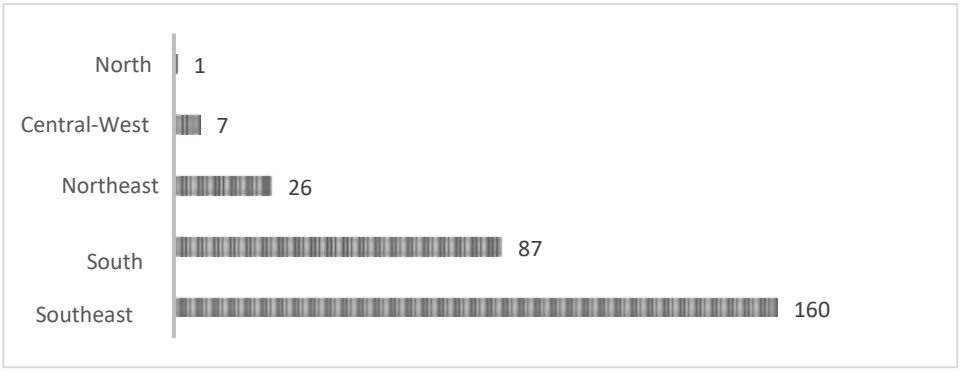
Based on the information obtained from the selected articles, a categorization was carried out considering the following aspects: number of authors, involved institutions, graduate programs involved, sectors of research application, main contribution presented, among other relevant data for discussion.

4. RESULTS

The 108 selected articles feature 281 Brazilian researchers as authors. Six articles are authored by only one researcher (codes 41, 50, 58, 62, 74, 79), and the article with the highest number of authors contains 15 researchers, all from the University of São Paulo (code 19).

Regarding the geographical distribution of these authors (Figure 2), considering the institution to which they are affiliated, there is a predominance of authors established in the Southeast Region (56.9%), with São Paulo being the state with the highest contribution, with 76 researchers, followed by Rio de Janeiro, with 55 authors. The Southern Region (30.9%) ranks second, with Santa Catarina accounting for 39 researchers. Following that, Paraná has 33 authors, and Rio Grande do Sul has 15 professionals. In the Northeast Region (9.3%), Pernambuco stands out with 14 researchers, followed by Sergipe and Paraíba, both with 7 authors each. The Federal District is the state in the Central-West Region with the highest number of authors (5), followed by Mato Grosso do Sul with 2 participating researchers. The North Region had only one researcher/institution's participation, contributing to two works (codes 75 and 76).

Figure 2: Distribution of authors according to Regions of Brazil



The institutions to which the first author of each work belongs were counted. Forty-seven different institutions were identified among the 92 works, corresponding to the total number of studies with distinct first authors. Of these, the number of works for each institution varied from 8 to 1, with the Federal University of Rio de Janeiro occupying the first position (Table 1).

Thirty-two institutions had only one identified first author, of which 5 are companies from different sectors (e.g., aviation and furniture industry), 2 represent industry and trade institutions in the country (Social Service of Industry and National Service of Commercial Apprenticeship). Additionally, international institutions were also identified, such as the University of Lyon (codes 31, 60) and the University of Guadalajara (code 71). It is worth noting that the identified international institutions represent articles with Brazilian

researchers, highlighting the presence of exchange between countries for research purposes.

Table 1: Participating Institutions According to First Author

Institution	**N° First Authors**
Universidade Federal do Rio de Janeiro	8
Universidade Federal de Santa Catarina	7
Universidade de São Paulo e Universidade Federal de São Carlos	6
Universidade do Estado de Santa Catarina	5
Pontifícia Universidade Católica do Rio de Janeiro e Universidade de Brasília	4
Universidade de Campinas, Universidade Federal de Pernambuco, Universidade Federal de Paraná e Universidade Federal do Rio Grande do Sul	3
Universidade do Estado de Minas Gerais, Universidade Federal de Minas Gerais, Universidade Federal de Sergipe e *University of Lyon*	2

The exchange between researchers and institutions is essential to promote the exchange of knowledge and experiences, enriching studies and work contexts. Thus, it was identified that 63 articles were developed by researchers from the same institution (58.3%), 29 works were carried out through exchange between Brazilian institutions (26.9%), and 16 articles were developed in partnership between researchers from Brazilian and international institutions (14.8%). Table 2 illustrates which articles are referred to in each category.

Tabela 2: Instituições participantes

Category	**N° Articles**	**Codes**
Just one institution	63	1, 2, 3, 4, 5, 6, 7, 9, 16, 17, 18, 19 ,20 , 22, 23, 25, 26, 28, 30, 32, 33, 36, 37, 39, 40, 41, 42, 43, 44, 45,

		48, 50, 51, 52, 53, 54, 58, 59, 61, 62, 65, 66, 67, 70, 72, 73, 74, 77, 79, 80, 81, 82, 84, 86, 87, 88, 96, 99, 101, 104, 106, 107, 108
Exchange between Brazilian institutions	29	8, 10, 11, 12, 13, 15, 24, 35, 38, 49, 55, 56, 57, 68, 69, 75, 76, 78, 83, 85, 89, 90, 91, 92, 93, 94, 97, 98, 105
Exchange between Brazilian and international institutions	16	14, 21, 27, 29, 31, 34, 46, 47, 60, 63, 64, 71, 95, 100, 102, 103

The different thematic areas addressed in the 20th IEA, and which comprise the 10 volumes of its Annals, are illustrated in Figure 1 (Method of Research section). One of the areas stands out with a significant number of articles above the others: Ergonomics in Design, Design for All, Activity Theories for Work Analysis and Design, Affective Design, with 44 articles (40.7%). Of these, nine works can be classified solely as theoretical research, without the use of empirical data (codes 70, 76, 79, 81, 82, 88, 90, 102, 108). Four of these works focus on the theme of Project and Product, along with a constant context in the works of this area, accessibility. In total, the theme of Project and Product is present in 20 articles in this area of the event. Nascimento et al. (2018) sought to create a list of accessibility recommendations for designing graphical user interfaces for games based on Down Syndrome carriers. Nakayama and Martins (2018) developed design guidelines that enhance and optimize the clothing design process focusing on people with reduced mobility. Tavares et al. (2018) aimed to contribute to the improvement of inclusive design studies aimed at people with cerebral palsy and, indirectly, other motor dysfunctions, identifying assistive technologies that facilitate computational access to this audience. Using empirical data and with a proposal for applied intervention, Azevedo et al. (2018) presented the development of a spirometer for use by visually impaired children in respiratory physiotherapy care, focusing on its attractiveness to the child, simplification of use by physiotherapists, and low cost for institutions. The theme of accessibility is present in 13 works in this category of the event,

involving studies focused, for example, on concerns with design for elderly users (codes 70, 81, 91) and the analysis of built spaces regarding the ease of mobility for people with reduced mobility (codes 84, 85, 86, 89). Studies from other categories of the event also focused on design for elderly users, such as code 36, linked to the Aging, Gender and Work, Anthropometry, Ergonomics for Children and Educational Environments category.

Other analyses conducted in this bibliometric study were: (i) regarding theoretical contribution, practical involvement involving ergonomic analysis or ergonomic intervention; (ii) regarding physical, cognitive, or organizational approach; (iii) sector of application of the studies. Table 3 presents the results of the analyzed information, and it is noted that most studies present a practical contribution, developing and applying ergonomic analysis tools and methods and presenting improvement recommendations in the analyzed sectors. However, only 10 studies delve into and discuss ergonomic interventions carried out. Of these, two studies (codes 23 and 34) further explore the importance of cost analysis post ergonomic intervention. Regarding the approach given to the studies, it is observed that 48 of them include a physical approach in their analyses (with 29 having exclusively physical approach). The physical approach concerns biomechanical, anatomical, anthropometric, and physiological issues (IEA, 2018) and was a precursor in ergonomic studies. On the other hand, the cognitive approach, according to IEA (2018), concerns mental processes (such as perception, decision-making, memory), and 32 studies include such an approach. Finally, the organizational approach focuses on optimizing the sociotechnical system (IEA, 2018), and 39 include such an approach. Among the sectors of application of the studies, the health sector stands out, involving studies in hospitals (codes 3, 5, 19, 75, 89), with hippotherapy (codes 23, 106), among others.

Table 3: Contribution, Approach, and Sector of Application of the Analyzed Studies

Analysis		**N° articles**
(i) contribution	Theoretical	25
	Practical - analysis	73
	Practical - intervention	10
(ii) approach	Physical	29
	Cognitive	6
	Organizational	16
	Physical - Cognitive - Organizational	6

	Physical - Organizational	5
	Physical - Cognitive	8
	Cognitive - Organizational	12
	Not applicable	26
(iii) Application Sector	Not applicable	19
	Health	11
	Education	7
	Transportation	6
	Slaughter and meat processing, electrical sector	5
	Agriculture, aviation, office, food sector	4
	Chemical industry, public sector	3
	Construction, public space, sports, automotive industry, furniture industry, electronics industry, fashion, multiple sectors, recycling, designers	2
	Gas and oil platform construction, cosmetics industry, paper industry, packaging industry, judiciary, urban mobility, maritime navigation, prison, consulting service, aesthetic service, cleaning service, jewelry, telecommunications	1

5. CONCLUSION

Scientific events are important milestones for exchanging information and promoting knowledge. The 20th Congress of the International Ergonomics Association (IEA 2018) is an example, featuring 1010 studies published across 10 different thematic axes. This study aimed to identify the contribution of Brazilian researchers, and through bibliometric research, found 108 publications with at least one author affiliated with a Brazilian institution. Brazil was the South American country with the highest number of contributions.

The 108 publications were analyzed regarding the thematic axis, number of authors, location of authors' institutions (highlighting national and international partnerships), state of origin and institution of the first author, study contribution (theoretical, practical - analysis, practical - intervention), approach (physical, cognitive, or organizational), and application sector. Mapping a panorama of Brazilian contributions on the international stage allows for identifying explored areas and possibilities for exchange among existing and future scientific efforts.

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APPENDIX

Cód. Article	Title of the article	Citation

1	Study on the Pause Effects During the Work Day in the Cardiovascular Load in the Line of Production of High Cadence With Heart Rate Assessment	Dengo et al. (2018)
2	Occupational Exposure to Agrochemicals: A Literature Review	Junqueira e Contrera (2018)
3	Effects of an Industrial Logic Implemented in Service Relation: The Case of Drivers of Ambulances of a Brazilian University Hospital	Maciel et al. (2018)
4	Perception of Working Conditions and Health by Prison Officers of a Male Prison from Brazil	Reinert et al. (2018)
5	Affective Appraisal of Hospital Reception Scenes	Maciel et al. (2018)
6	Contributions of Activity Ergonomics to Design a Virtual Tool for Sharing Mental Health Care	Alonso et al. (2018)
7	The Relation of Visual-Digital Literacy in User Interaction with Mobile Devices	Carrion e Quaresma (2018)
8	Assessment of Occupational Vibration on Tire Track Harvesters in Forest Harvesting	Schettino et al. (2018)
9	The Influence of the Metabolism in the PMV Model from ISO 7730 (2005)	Avelino et al. (2018)
10	Perception of Pesticide Contamination Risk in Rural Workers with Low Schooling Level	Minette et al. (2018)
11	Stochastic Economic Viability Analysis of an Occupational Health and Safety Project	Miorando et al. (2018)
12	The Functional Resonance Analysis Method as a Debriefing Tool in Scenario-Based Training	Wachs et al. (2018)
13	Planning Simulation Exercises as Learning Lab: The Case of Digital Chart Changing Maritime Navigation Activity	Martins et al. (2018)
14	Ergonomics and Regulation: The Case of Job Rotation in a Brazilian Slaughterhouse	Messias e Nascimento (2018)

15	A Safety-II Approach on Operational Maneuvers of a Hydropower Plant	Portela e Guimarães (2018)
16	Social Networks Applied to Zika and H1N1 Epidemics: A Systematic Review	Araujo et al. (2018)
17	Ergonomic Analysis of Labor Applied to Scaffolders in a Shipyard in Brazil	Borges et al. (2018)
18	The Influence of Physiological Breaks and Work Organization on Musculoskeletal Pain Index of Slaughterhouse Workers	Martins et al. (2018)
19	Musculoskeletal Complaints in a Sample of Employees in a Tertiary Hospital: An Exploratory Preliminary Pilot Study	Fonseca et al. (2018)
20	Human Factors Related to the Use of Personal Computer: A Case Study	Reinert et al. (2018)
21	Capacity Index for Work, Psychosocial Risk of Work and Musculoskeletal Symptomatology in Workers of a Meat Processing Industry in Portugal	Lima et al. (2018)
22	Analyses of Musculoskeletal Disorders Among Aesthetic Students Applying the Methods: REBA, Nordic and FSS	Raymundo e Rotta (2018)
23	Equotherapy Center at a Glance for Ergonomic Activity: Epidemiological Profile Versus Therapeutical Practices	M. D. Boaretto et al. (2018)
24	The Need to Present Actual Costs After an Ergonomic Intervention	Vieira et al. (2018)
25	Challenges of Telework in Brazil: A Sociotechnical Analysis	Godoy e Ferreira (2018)
26	Collaborative Design Methods and Macroergonomics as Organizational Tools for Distance Education's Design Teams	Boechat e Mont'Alvão (2018)
27	Building Tools to Guarantee a 'Common Ground' Building Tools to Guarantee a 'Common Ground'	Santos e Alvarez (2018)
28	Virtual Simulations for Incorporating Ergonomics into Design Projects: Opportunities and Limitations of Different Media and Approaches	Paravizo e Braatz (2018)

29	From Diagnosis and Recommendation to a Formative Intervention: Contributions of the Change Laboratory	Vilela et al. (2018)
30	New Public Management, Performance Measurement, and Reconfiguration of Work in the Public Sector	Kawasaki et al. (2018)
31	Simulating Work Systems: Anticipation or Development of Experiences. AnActivity Approach	Béguin et al. (2018)
32	Work Macroergonomics Analysis (AMT Method): Identification of Ergonomic Demands in Sewing Laboratory	Debastiani e Silva et al. (2018)
33	Accounting Standard for Ergonomics: Relation of Ergonomics and Accounting	Vieira et al. (2018)
34	The BRICSplus Network: A Historical Overview and Future Perspectives of the Network's Role in Human Factors and Ergonomics	Davy et al. (2018)
35	Impact of Exercise and Ergonomics on the Perception of Fatigue in Workers: A Pilot Study	Pinetti et al. (2018)
36	Aging and Hand Functions Declining: Assistive Technology Devices for Assistance in Daily Life Activities Performance	Giordani e Cinelli (2018)
37	Facets of the Precariousness of Women's Work: Outsourcing and Informal Activity	Cardillo et al. (2018)
38	SOOMA - Software for Acquisition and Storage of Anthropometric Data Automatically Extracted from 3D Digital Human Models	Pastura et al. (2018)
39	Employing Game Engines for Ergonomics Analysis, Design and Education	Paravizo e Braatz (2018)
40	Playing for Real: An Exploratory Analysis of Professional Esports Athletes' Work	Paravizo e Souza (2018)
41	Usability in Electronic Judicial Process	Chaves (2018)
42	Air Travel Accessibility: Interaction Between Different Social Actors	Souza et al. (2018)
43	Ergonomic Approach of the Influence of Materials and the User Experience in the Interior of Automobiles	Ribeiro e Camâra (2018)

44	The Mobility in Belo Horizonte Through the Macroergonomics and Service Design	Botelho et al. (2018)
45	The Quality of Roads in Brazil: The Interrelation of Its Multiple Stressors and Their Impact on Society	Botelho et al. (2018)
46	Seat Comfort Evaluation Using Face Recognition Technology	Ciaccia et al. (2018)
47	Ergonomics and Crisis Intervention in Aviation Accident Investigation	Aslanides et al. (2018)
48	The Ergonomics of the "Seated Worker": Comparison Between Postures Adopted in Conventional and Sit-Stand Chairs in Slaughterhouses	Dias et al. (2018)
49	Epidemiological Survey of Occupational Accidents: A Case Study in the Flour and Animal Feed Business	Provin e Cantele (2018)
50	An Ergonomic Program in a Chemical Plant of Rhodia/Solvay in Brazil	Azevedo (2018)
51	Ergonomic Analysis on the Assembly Line of Home Appliance Company	Wagner et al. (2018)
52	Ergonomics Management Program: Model and Results	Varella e Trindade (2018)
53	Risk Assessment of Repetitive Movements of the Upper Limbs in a Chicken Slaughterhouse	Reis et al. (2018)
54	The Work of the Agricultural Pilot from an Ergonomic Perspective	Faria et al. (2018)
55	An Application of Ergonomics in Workstation Design in Office	Costa e Villarouco (2018)
56	Ergonomic Analysis of Secondary School Classrooms, a Qualitative Comparison of Schools in Naples and Recife	Sarmento et al. (2018)
57	Prototyping a Learning Environment, an Application of the Techniques of Design Science Research and Ergonomics of the Built Environment	Sarmento et al. (2018)

58	The Particular View: The User's Environmental Perception in Architectural Design	Pinto (2018)
59	Ergonomics and Technologies in Waste Sorting: Usage and Appropriation in a Recyclable Waste Collectors Cooperative	Souza et al. (2018)
60	Work, Innovation and Sustained Development	Valérie et al. (2018)
61	The Trucks as the Main Tool in the Cargo Transport in Brazil: The Driver's Health Impacts and the Sustainable Developments	Botelho et al. (2018)
62	Analysis of Ergonomics in the Reuse and Recycling of Solid Materials in Brazilian Cooperatives	Silva (2018)
63	Work Activity as a Social Factor of Metropolis Sustainable Development: Case of a Non-profit Organization in St. Petersburg (Russia)	Volosiuk et al. (2018)
64	When Creativity Meets Value Creation. A Case Study on Daytime Cleaning	Gasparo et al. (2018)
65	An Analysis of Usability Issues on Fashion M-commerce Websites' Product Page	Bozzi e Mont'Alvão (2018)
66	Ergonomics of Design - Problems in Making the Project a Reality	Oliveira et al. (2018)
67	The Factors that Influence Productivity During the Activity of Lining in Small Vertical Buildings in Brazil - A Case Study	Avelino et al. (2018)
68	Human Factors and Ergonomics Design Principles and Guidelines: Helping Designers to Be More Creative	Souto e Fadel (2018)
69	Application of the Equid Methodology and the Principles of Macro Ergonomics in Seat Design	Cantele e Nonemacher (2018)
70	Ergonomics of the Built Environment: Main Methodologies Used in Brazil and the Most Adequate Ones to Evaluate the Interaction Between the Elderly and Built Environment	Arruda Koehler et al. (2018)
71	Evaluation of Usability of Two Therapeutic Ultrasound Equipment	Castro-Luna et al. (2018)

72	Designing Solutions for Healthcare System Problems - LUFT Incentive Spirometer: Study of Case	Azevedo et al. (2018)
73	Integrating Ergonomics into Product Design Through the UCD Approach	Reinert e Gontijo (2018)
74	Interior Design Adequacy of Truck Sleeper Cabins in Brazil as to the Use as Temporary Dwelling	Mello (2018)
75	Ergonomics of a Children's Day Hospital	Ferrer e Villarouco (2018)
76	Cognitive Ergonomics in Architecture: Creativity and Ambience in Children's Healthcare Spaces	Ferrer e Villarouco (2018)
77	Functional Fashion and Co-creation for People with Disabilities	Brogin e Okimoto (2018)
78	Developing a Framework for a Participatory Ergonomics Design Processes: The MPEC Method	Braatz et al. (2018)
79	Systemic Body: Ergonomics of the Prevention	G. Victor (2018)
80	The Role of Design in Use in Agriculture: The Case of Brazilian Crops	Narimoto e Belussi (2018)
81	Cities and Population Aging: A Literature Review	Oliveira et al. (2018)
82	Analysis of Methods for Evaluation of Assistive Technologies Focused on Computational Access of People with Cerebral Palsy	Tavares et al. (2018)
83	Ergonomics in the Built Environment: Survey of the Factors Related to the Corporate Work Environment Linked to Activities of High Concentration	Cantele e Nonemacher (2018)
84	Ergonomic Accessibility Assessment in Mixed-Use Buildings	Calvet e Abrahão (2018)
85	Accessibility at University Campus in Historical Center	Almeida et al. (2018)

86	Antonio Franco Market: Case Study on Accessibility in Public Buildings	Santana et al. (2018)
87	Information for Tactile Reading: A Study of Tactile Ergonomics of Packaging for Blind People	Ribeiro et al. (2018)
88	Fashion Design Methodology Tools in Products' Development for People with Disabilities and Low Mobility	Nakayama e Martins (2018)
89	Look with the Eyes of Others: Accessibility in Hospital Environments	Silva e Costa (2018)
90	Recommendations for the Development of Accessible Games for People with Down Syndrome	Nascimento et al. (2018)
91	Passengers with Disabilities, Elderly and Obese in Brazilian Air Transportation: Contradictions in the Activity Systems	Silva et al. (2018)
92	Ergonomic and Psychosocial Aspects of Electrical Energy Maintenance Activities on Transmission Lines	Gemma et al. (2018)
93	From Micro to Macro Dimension: An Inverted Way to Think Solution in Designs	Resende et al. (2018)
94	Design as a Reflection of User Experience	Resende et al. (2018)
95	Building a Dialogical Interface: A Contribution of Ergonomic Work Analysis to the Design Process	Lipovaya et al. (2018)
96	The Real Richness in the Semi-jewel Production	Bezerra Gemma e Silva (2018)
97	Developing a Methodology for a Participatory Ergonomics Evaluation Process: Human Performance and Productivity Cycle	Mazzoni et al. (2018)
98	Conceptual Principles as Intermediary Object: Case of an Industrial Unit	Resende et al. (2018)
99	Ergonomics and Architectural Programming: A Possible Articulation?	Rocha e Abrahão (2018)
100	eSports: Opportunities for Future Ergonomic Studies	Lipovaya et al. (2018)

101	Simulation, Prototyping and Experimentation - The Potential of the Maker Labs to Achieving a Design-Driven HFE	Braatz et al. (2018)
102	Innovative Labs and Co-design	Duarte et al. (2018)
103	Designing Therapeutic Projects Within Multiprofessional Health Teams: Integrating the Dimension of Work	Carmo Alonso et al. (2018)
104	The Collective Work in the Subsea Integrated Operations Centre: The Ad Hoc Teams in the Solution of Unexpected Situations	Maia e Duarte (2018)
105	Co-conception Spaces: New Organizations to Support Participatory Projects	Marins e Bittencourt (2018)
106	The Influences of the Ergonomic Work Analysis in Activities of a Center of Equine Therapy	Boaretto et al. (2018)
107	Emotional Attributes of Urban Furniture	Pizzato e Guimarães (2018)
108	User-Centered Design: Ethical Issues	Okimoto et al (2018)