WIDE: building a Brazilian Human-Data Interaction agenda for the next 5 years

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On October 17, 2022, the Research Workshop on Human-Data Interaction was held at the XXI Brazilian Symposium on Human Factors in Computing Systems (IHC 2022), in the city of Diamantina - Minas Gerais. The objective of the workshop was to foster discussions on Human-Data Interaction, supporting the creation of a community and outlining paths for future research in the area. The topics of interest in the workshop were: data literacy, data physicalization, data visualization, explanations of processes based on data, data science involving humans, accessibility of data and visualizations, human-data interaction in social and educational contexts, theories of human-data interaction and innovative implementation techniques of human-data interaction (HDI). As a result of the interactions carried out over an afternoon of activities, an agenda for research in HDI for the next 5 years was drawn up, comprising 8 priority axes, which are: Accessibility; Design and UX; Transdisciplinarity; Data Representation; Environment; Storytelling; Metaverse and Legal Challenges.

Keywords: interaction, data, literacy, design, workshop

1 INTRODUCTION

On October 17, 2022, the Workshop on Interactions with Data Experiences (WIDE) was held at the XXI Brazilian Symposium on Human Factors in Computational Systems, in the city of Diamantina (IHC 2022) - Minas Gerais. The workshop was organized in collaboration with the researchers Luciana Brito, Juliana França, Angélica Dias and Adriana Vivacqua (Universidade Federal do Rio de Janeiro), Luiz Morais (Inria) and Caroline Queiroz Universidade Federal dos Vales de Jequitinhonha e Mucuri). The program committee was formed by the researchers Adriana Vivacqua (UFRJ), Angélica Dias (UFRJ), Carla Freitas (UFRGS), Caroline Queiroz Santos (UFVJM), Celmar Guimarães da Silva (Unicamp), Doris Kosminsky (UFRJ), Eliane Victorelli (Unicamp), Isabel Meirelles (OCAD University), Julia Giannella (UFF), Juliana França (UFRJ), Julio dos Reis (Unicamp), Luciana Brito (UFRJ), Luciana Salgado (UFF), Luiz Augusto de Macedo Morais (Inria), Nazareno Andrade (UFCG) and Rodrigo Medeiros (Cesar School).

The objective of the workshop was to stimulate a discussion on human-data interaction, supporting the formation of a community around the subject, and tracing paths for future research, in addition to advancing the literature on human-data

interaction and fostering partnerships and new scientific connections on the subject in Brazil [3]. As part of the event, the following articles were presented: Desafios e propostas para Transparência de Dados Pessoais (Challenges and proposals for Transparency of Personal Data), by [7]; Interação Humano-Dados: Análise de Dados para Segurança de Barragens Brasileiras (Human-Data Interaction: Data Analysis for the Safety of Brazilian Dams), by [6]; Design de uma Escala para Avaliação de Literacia de Dados (Design of a Data Literacy Assessment Scale), by [2]; and Uma análise da compreensibilidade das visualizações de dados durante a pandemia de COVID-19 no Brasil (An analysis of the understandability of data visualizations during the COVID-19 pandemic in Brazil), by [8].

2 BACKGROUND

As an attempt to learn from the workshops held at the ACM CHI Conference on Human Factors in Computing Systems (CHI), we have raised some articles that reflect the state of the art in creating workshops.

Based on the need to move away from the narratives that universalize the production of knowledge, giving way to diversified and contextualized experiences, narratives, and epistemologies, [10] created an interactive workshop held at CHI 2021 called Decolonizing Design Practices: Towards Pluriversality. The workshop was created to bring together researchers and designers who develop decolonization practices in the HCI approach to socialize participatory and inclusive humanistic actions aimed at local and regional contexts related to the domains of transcultural and transdisciplinary technology design; humanizing emerging technology; participatory action research; design anthropology futures; and design tech for social and racial justice [10]. The authors/researchers raised 4 questions to help map decolonial practices in HCI: i. What are state-of-the-art examples of decolonizing practices and epistemologies in/for contemporary HCI research and practice? ii. What can we learn from participatory design experiences of decolonizing practices applied in diverse contexts, geographical, academic, corporate, and not-for-profit? iii. How are theoretical discourses of decolonization integrated into practices, methodologies, or knowledge production in the research? and iv. What are the future trajectories of decolonizing HCI practices for pluriversal approaches to design and technology? [10]. The workshop was held remotely and included the following steps: introduction of workshop format and content by the organizers; participatory design of a social robot and introduction of participants; embracing epistemologies dialogue; exploring expressions of decolonization; prototyping a decolonizing toolkit of methods; and summary conclusion and way forward.

[5], from the reality of exploring broader applications of drones such as key components of virtual environments and as assistive tools, developed the workshop iHDI: First International Workshop on Human-Drone Interaction. The workshop aimed to bring together research and industry professionals to discuss novel HDI applications and challenges to drive research in the coming decade, besides creating an interdisciplinary community with researchers in Human-computer interaction, Human-Robot Interaction, Ubiquitous Computing, Interaction Techniques, User Privacy, and Design [5]. As a product of the workshop, the authors forecasted a special edition of a journal with information on methodologies for HDI research.

[9] created CHI 2018 Workshop: Data-Driven Educational Game Design to discuss with specialists in human-computer interaction, education, educational games, and data analytics how games can be designed to improve engagement and learning, since it was not very clear until that moment the role of motivation in learning through games, for example. The authors raised some important issues to be discussed during the workshop: i. What are the most propitious techniques for identifying and analyzing the key features of educational games? ii. What have we learned about ways to balance the use of games and learning features in designing educational games? What is the optimal way to bring these disparate (and sometimes conflicting) features together to optimize learning? iii. How can data collected during gameplay, both qualitative and quantitative, be used to help us design and build better games, games that lead to the best student outcomes? iv. How

can games be used for implicit assessment, as tools for analyzing the instructional effects of games, and, ultimately, for designing better games? [9]. As a product of the workshop, an article was outlined summarizing the state of the art in data-driven educational game design, in addition to offering recommendations for game developers and designers.

[1] held the Hacking Women's Health workshop at the CHI Conference 2017 intending to join the efforts of the HCI community to discuss methods, ideas, and tools related to women's digital health, on topics such as taboo, power, and prejudice related to emerging fields in HCI, such as reproductive health, experiences of motherhood and the use of technology for exploring female sexuality. The workshop was influenced by the themes: i. Women-Centered Design; ii. Feminist Technologies, iii. Hacking and Making; and iv. Feminist Speculative Design [1]. The workshop was held over 2 days and researchers were invited to rethink and reimagine women's health technologies. In addition to the website, the workshop planned a Twitter hashtag as a means of disseminating and sharing ideas on topics of interest. Among the plans for after the workshop, the authors thought of exhibiting throughout the CHI 2017 the artifacts created during the activities, fostering discussions on the workshop theme throughout the conference, disseminating the media content created during the workshop on the website of the workshop, including a submission to the ACM interactions magazine outlining outcomes from the workshop and publish participants' research in a special issue of a leading HCI journal.

3 TOOLS AND METHODS

The workshop elaboration began when the group was created to collaborate in writing the proposal for submission to the IHC 2022, which occurred through the search for researchers in the area of human-data interaction belonging to the Brazilian and international HCI community. For the submission of the proposal, the call to authors was first defined for the submission of works articulating the areas of HCI and human-data interaction, as well as innovative projects related to the theme, mainly related to accessibility and social applications. From there, the topics of interest for the workshop were defined, which were: i. data literacy; ii. physicalization of data; iii. data visualization; iii. explanations of data-driven processes; iv. Data Science involving humans; v. accessibility of data and visualizations; vi. human-data interaction in social contexts; vii. human-data interaction in educational contexts; viii. human factors in the context of human-data interaction; ix. theories of human data interaction; and x. innovative implementation techniques of human-data interaction.

After defining the topics of interest, the program committee was defined, through the search for Brazilian researchers who work within fields of study related to the topics of interest in the workshop. After this stage, the event website was built with all the information necessary for the submission of proposals, as well as other information related to the event. As a last step, the workshop schedule was defined, with the activities that would be carried out, as well as the acquisition of the necessary resources for the event (stationery materials, projector, sound system, and adequate physical space).

Table 1: Workshop Timetable

Steps	Schedule
Opening and participant's presentation round	14h – 14h15
Research presentation	14h15 – 15h30
Discussions by interest groups (part 1)	15h30 – 16h
Coffee break	16h – 16h30
Discussions by interest groups (part 2)	16h30 – 17h
Results presentation	17h – 17h30

WIDE took place throughout the afternoon and had the participation of 20 researchers, including professors, master's, doctoral and undergraduate students. The workshop started with the presentation of the planned program right after the presentation of each of the 4 selected articles, followed by 1 stage of collaborative activity with participants divided into 2 large heterogeneous groups, each with approximately half the number of participants in the event and divided according to individual choice, in which they should survey proposals for the composition of an agenda for HDI research for the next 5 years, taking as inspiration the presentations of the research approved for the workshop. Each group initially had 1 hour and 30 minutes for internal brainstorming (Figure 1). After this step, the groups met for 30 minutes in a large group to consolidate a proposal for a single agenda and present the results.

Among the articles selected for presentation, [7] presents a discussion on the concepts and challenges of Data Transparency, reports activities of its research group to make transparency perceptible and controllable for data subjects and even presents a research agenda for the following years; [6] evaluated the usability of an information system on Brazilian dams composed of a dashboard and an information filter, mapping problems in the interaction to improve the system; [2] To contribute to Brazilian basic data education, designed a qualitative scale of data literacy, through Design Science Research, capable of assessing students in 60 skills and competencies organized into 7 categories ranging from data collection to making informed decisions; and [8] presented a pictorial analysis of data visualizations released by Brazilian state governments during the COVID-19 pandemic with the objective of contributing to the identification of graphics with the potential to be misinterpreted or poorly understood because they do not follow basic guidelines in the area of data visualization .

4   RESULTS

As a result of the workshop, an agenda for research in Human-Data Interaction was obtained for the next 5 years, consisting of 8 priority development axes for the area accompanied by concerns/provocations to feed the development of solutions:

1. **Accessibility** - how to adjust the understanding of information by users with autism and Down syndrome?
2. **Design and UX** - transparency of personal data, design patterns, dark patterns, and color patterns for data visualization.
3. **Transdisciplinarity** - transdisciplinarity in teaching data literacy, transdisciplinarity in data visualization, small HDI community, and few works in the field of HDI.
4. **Data representation** - little knowledge about how to represent data, how to make users understand what we want to represent? encouraging reading, information optimization, use of tools, ontology, and anonymization.
5. **Environment** - smart energy (GRID), smart government.
6. **Storytelling -** how to identify the veracity of information? What to show in storytelling? what to do with fake news, deep fake? source of information/what is true? narrative and storytelling.
7. **Metaverse** - machine learning and artificial intelligence.
8. **Legal challenges** - Brazilian "General Personal Data Protection Law (LGPD)" and privacy, protection/consent, Brazilian "Access to Information Law"/public information, Brazilian Child and Adolescent Statute (ECA), Brazilian Statute of the Elderly, Brazilian Statute of Persons with Disabilities, Brazilian Constitution.

Furthermore, important research relationships were consolidated and a collaboration network was built between researchers in HDI, which materialized in a WhatsApp group with 20 participants initially.

Figure 1: panel with workshop results (on the upper right). On the left, there is a part of the workshop participants.

5 CONCLUSION AND NEXT STEPS

Based on the broad participation and involvement of the HCI community with the workshop programming, as well as the quality of the research evaluated and the applicability of the results obtained, it is intended to continue the workshop in new editions, expanding the interaction between researchers in HDI in Brazil and around the world. Therefore, the expansion of research in the thematic axes indicated in the agenda obtained for the next 5 years is encouraged, as well as the investigation of new thematic axes that complement it.

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