Facilitating Data Inclusion and Empowerment through Arts-Based, Creative and Playful Approaches

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ABSTRACT

Big data is a topic of growing importance in the modern world, these days our lives are shaped by the information we consume. As such data literacy is becoming an increasingly crucial skill to have. However, there are barriers of entry to understanding scientific data for the average person. This workshop will explore ways in which we can overcome those barriers, and attempt to engage people with scientific data through creative, playful, and fun approaches. The goal of this workshop is to promote data inclusivity and literacy, and to demystify the concept of data. This workshop will use art-based approaches as a means of communicating data. It will also involve participants making sense of the data themselves through data storytelling techniques. This workshop will also be a chance to reflect on what barriers to data inclusivity exists, and the role that data plays in building empathy towards others and the world around us.

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1 ORGANISERS AND THEIR BACKGROUNDS

Natasha Tylosky is a researcher in Human Computer Interaction in the Department of Software Engineering at LUT University. She has a background in game design, interaction design and graphic design. In 2019 she completed her masters degree in Cognitive Systems and Interactive Media at the University of Pompeu Fabra. Natasha is interested in the intersection between art, data and science communication, and how we can apply art and game design techniques to science communication. Her research focuses on how scientific data can be communicated to the general public through interactive data visualizations, data storytelling and gamification. Natasha is currently pursing a PHD at LUT focusing on how emotional design can influence engagement with interactive data visualization.

Priscilla Van Even is a researcher at the Meaningful Interactions Lab (Mintlab) of the KU Leuven. In her research she focuses on the development of a framework for meaningful science communication. Furthermore, she taught research methodology at the University of Leuven, is experienced in the education of young (and adult) people and holds a position as a museum educator in the Musical Instrument Museum and the Royal Museum of Art and History in Brussels. Priscilla holds a Master degree in Cultural Anthropology and Development Studies, a Master degree in Philosophy, a Teaching Degree in Philosophy and Social Sciences and a Professional Bachelor degree in Elementary Education. Currently, she is a PhD candidate in Social Sciences. Her fields of expertise and research interests are philosophy of culture, research methodology, biopolitics, media psychology, cultural heritage and museums, science communication, creative research dissemination, China and Japan studies and education.

Sandy Claes holds a faculty position at LUCA School of Arts – Associated Faculty of Arts of KU Leuven, Belgium. In her research work, she focuses on the overlap between media, technology and public space. Previously, she has worked as a lead user researcher at the innovation department of public broadcaster VRT. Sandy received her PhD in Engineering Science (2017) from KU Leuven in which she focused on the design of public visualization. Her research work has been published at international, peer reviewed conferences concerning the human factor of interactive technologies and design, such as CHI, NordiCHI and DIS. She served as an Associate Chair for CHI Late Breaking Work (2019) and the full paper track of NordiCHI (2020) and INTERACT (2021). Sandy has a background as a master in audiovisual arts (2005). Her audiovisual work has been awarded on several international film festivals; such as I Castelli Animati in Rome and The international short film festival of Leuven, and has been exhibited at several international venues; such as LABoral, Madrid and Museum M, Leuven. With this mixed background of science, design and arts, Sandy approaches research projects from a multi-disciplinary viewpoint.

Anne Pässilä, PhD, MA, is Senior Researcher in the School of Engineering and Science at Lappeenranta- Lahti University of Technology (LUT), Finland and Visiting Research Fellow at the University of Chester, UK. She is a pioneer in designing and applying

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arts-based research approaches (ABR) and arts-based methodology (ABM) in technological and industrial management contexts. As a scholar she has published extensively on this and as practitioner is in demand for her expert facilitation skills in co-creation and innovation processes both within and beyond the academy. Her interdisciplinary and transdisciplinary work involves leading co-design processes of innovative qualitative research and development methods which she undertakes nationally and internationally. She specializes in the creation and formulation of participatory sense-making activities to allow for learning in perplexed situations; this centers around the arts-based method she has conceptualized as 'collective voicing'. In LUT University she is a core member of the Innovation Research Team and collaborates across a wide range of faculty research teams including Software, Business & Economics, Sustainable Science.

Antti Knutas, D.Sc. (Tech), is an assistant professor in software construction at the Department of Software Engineering in LUT University. His research interests involve human factors in software engineering, computer- supported collaboration, and civic technology from a software engineering perspective. The current research area is how grassroots civic tech groups design, create, and share software. Another recent research area is how the design principles of sociotechnical software systems can promote community engagement and collaboration. His research methods include both qualitative and quantitative approaches, and he aims to provide prescriptive, actionable knowledge that will inform the future design of such systems or their software construction processes. In addition to research at LUT, he has worked with the Code for EU civic technology network in Ireland, BIGroup at Dublin City University, and the PONG labs in the University of Milan.

Annika Wolff is an assistant professor at LUT University. Her research is in the newly emerging field of human-data interaction, at the intersection between complex data, machine and human learning. Her research focuses on how people make sense of, interact with and design from complex data, such as derived from IoT and within smart cities. She is currently Co-I of H2020 (SWAFS) project ParCos on the Participatory Communication of Science, and PI of Academy of Finland project Building the Civic DataScape. She has conducted several workshops in recent years at venues such as DIS and C&T concerned with data exploration and sensemaking.

2 THEME

Data has the potential to be utilized as part of solving wicked problems, it can find and reveal patterns that are otherwise difficult to spot. Data may also play a role in supporting people to develop empathy towards their environment (in a broad sense, including physical and digital realms) by making visible issues and problems that otherwise remain hidden. But data has strong relationships with the place and context from which it was derived and often those who are also related with this place are best placed to help make sense of the data [1]. Very often, this means the general public will have an important role to play in collecting and interpreting data, such as for solving wicked problems. Today, the general public still encounters many barriers when aiming to interpret and appropriate data. Key problems are that it may be hard to access and even when it is available it requires specialist tools and knowledge for making sense of it, which puts it out of reach of many. No one should be excluded from accessing or using data due to disabilities, technical barriers, economic circumstances, data literacy, cultural factors, gender, age, language barriers or any similar potentially discriminatory factors. Yet, in order to achieve such data inclusion, it is important that everyone has the capability to use data. Further, it is desirable that this experience should be enjoyable and something that people actively want to do.

This one day workshop will therefore explore creative, playful and arts-based approaches to data sensemaking and consider how such approaches may, or may not, lead to greater data inclusion and even data empowerment, I.e. the ability people have to access, produce and use data as well as the control they have over their personal data. Some examples of data empowerment may be:

- Participating in citizen science initiatives by collecting, analysing and/or interpreting data
- Using data as evidence to identify and advocate on issues of concern, such as pollution, climate change, loss of biodiversity, accident hotspots.
- Being able to visualize and empathise better towards problems by making them more 'visible' through data
- Validating and interpreting data and other evidence that is presented as part of science communication.
- Innovating new products that directly or indirectly utilise data.
- Understanding and determining how personal data is collected and used, being able to identify the benefits or harm that comes from its use, and having the possibility to control its use.

There are generally considered to be two approaches to lowering barriers for using data:

1. To improve people's capabilities, e.g. by building data literacy
2. To make data easier to use.

The Communities and Technologies workshop 'Civic data literacies for bottom-up innovation' [2] in 2019 took data literacy (the first perspective above) as a starting point and converged towards identifying possible tools and methods to address common data literacy problems that prevent community engagement with data, and essentially through this make data easier to use. By contrast, this workshop will build on the findings from the 2019 workshop, yet start from the second perspective 'make data easier to use'. The focus will be on arts- based, narrative and other creative methods for making sense of data, appropriating it, and ultimately, using this data to empathize with the data context.

Arts-based approaches are methods that are based on a specific form of art. For example, methods based on theater and drama are often designed with the help of basic elements of dramaturgical framing (role, situation, focus/perspective and tension often articulated and performed physically through the living body). These different methods are used to achieve a wide range of affects, such as to support intuitive and creative thinking, invite multiple perspectives, foster new ideas and engage with problems through multiple senses. In particular, they are often used for their effectiveness in building empathy, for example towards marginalised groups [3] [4] [5]; for conflict resolution [6], or for building social justice through the practice and philosophy of the Theater of Oppressed

[7]. Arts-based methods can minimize the need for language, as communication may be done through other means, they can be done using little to no technology and may in some cases even require no materials. Combining arts-based approaches with data exploration and sensemaking – especially participatory sensemaking – has good potential for data inclusivity. Many people assume that data is objective and unbiased. Yet, the meaning of data can change depending on who, where, when and why people are looking at it. For this reason, participatory approaches may facilitate the interpretation of data, which are sensitive to different possible perspectives based on these varying starting points. Arts-based methods may also support empathy building through data.

Similarly, creative and playful approaches have been used effectively as tools to lower barriers for engaging with data [8] including the use of comics to curate data information 98], street art to facilitate opportunistic encounters with data [10] and card and board games for exploring datasets [11] [12](see also Datopolis from the Open Data Institute).

3 GOALS

The goal of this workshop is to explore how to improve data inclusivity and empowerment by minimizing the barriers that people may face in their encounters with data, whilst at the same time making data more fun to use. As a first step, we will consider some arts-based and creative approaches to data sensemaking that are part of ongoing work of the organisers. Next, we will collectively explore how to extend these approaches, combining the existing knowledge of organisers with knowledge and cases brought by other participants. This will occur through interactive activities that aim to answer questions, such as:

a) What are the most critical barriers against data inclusivity and empowerment?
b) Which barriers are best overcome by arts-based, creative and playful approaches and which ones are better tackled through alternative means?
c) What is the role does data play in building empathy towards others and the environment and what methods can support such empathy building?
d) How to critically reflect participatory approaches concerning data in order to avoid organising pseudo participation: how to reflect the ownership and agency of the people/communities involved in collecting and making sense of data.

4 ACTIVITIES

The workshop is scheduled for one full day. Activities will include:

- Research exchange. The first part of the day will consist of a fast-paced research exchange where participants will get to know each other by sharing three key facts about their research. Papers will be made available for all participants in the shared workshop space online and participants will be invited to read through them before the start of the workshop.
- Participating with existing approaches. Participants will have the possibility to try out using a range of arts-based, creative and playful approaches for making sense of civic data sets, including roleplaying, improvisation, embodiment, sonification, physicalisation, narrativity, and so on.
- Sandpit. Using data and stories brought by the organisers, the participants will have a chance to ideate, co-design and test out new arts-based and narrative methods for exploring and/or communicating with data. They could make sketches, short videos, clickable mockups or similar to convey their ideas. The organisers will suggest free and (where possible) online tools for these activities. Roughly, this will be structured as:
  - Participants have a 45 minute break to come up with ideas on their own
  - Participants work in groups to discuss and critique ideas, choosing one or more that they want to prototype
  - Prototyping time: participants will work on rapidly prototyping their method.
  - Share and test: groups will share and test their ideas with other groups.

The workshop can be organised in a hybrid way (I.e. facilitating both physical and online presence) or fully online if needed. We will utilise Miro for both co-working and sharing artefacts amongst all participants. Participants, whether located at a conference venue or at home, will have options for using pen, paper, post its or other items to generate ideas and sketches and share them by taking a photo and uploading it to the shared Miro board, or screenshotting from other applications. In order to avoid zoom fatigue, the majority of the day is intended to be participatory and flexible. Those who are working at home would be able to do some of the creative activities on their own and away from a screen, if they preferred to work that way.

5 MAXIMUM NUMBER OF PARTICIPANTS

The maximum number of participants is 30, this would apply in both an online, virtual and hybrid situation. Participants are welcome from a variety of backgrounds, we welcome artists, researchers in humanities and HCI, and practitioners.

6 SOLICITING AND SELECTING PARTICIPANTS

The call for participation will be distributed to potential academic and practice-based partners via the H2020 ParCos project communication channels, via existing mailing lists of the research groups of the involved universities and via the website that will be set up for this workshop. Potential participation can be expressed by means of a position paper. Here, potential participants will be encouraged by solicitation of a wide range of alternative options for communicating their position, including sketches, photos or even speculative

designs. Another selection criterion will be to maximise the diversity and originality of the proposed ideas. Finally, the organisers will strive to compile a heterogeneous workshop participant list in terms of spanned (both academic and professional) profiles.

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8 PUBLIC DESCRIPTION OF THE WORKSHOP

In our increasingly data-driven world, humans should be enabled to engage with data in order to facilitate data sensemaking. In fact, understanding environmental data allows us to better understand our surroundings and build empathy with its requirements and challenges. In this workshop, we will explore a number of arts-based, creative and playful approaches to support data interpretation of civic data sets. Participants will deploy these approaches to overcome data literacy issues and build empathy through data.

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REFERENCES

[1] Loukissas, Y.A., 2019. All data are local: Thinking critically in a data-driven society. MIT Press.
[2] Wolff, A., Knutas, A., Palacin, V., Seidelin, C., Kun, P. and Mulder, I., 2019, June. Civic Data Literacies for Bottom-up Data Innovation. In Proceedings of the 9th International Conference on Communities & Technologies-Transforming Communities (pp. 306-309).
[3] Day, L., 2002. 'Putting Yourself in Other People's Shoes': The use of Forum theatre to explore refugee and homeless issues in schools. Journal of Moral Education, 31(1), pp.21-34.
[4] Oliver, M.B., Dillard, J.P., Bae, K. and Tamul, D.J., 2012. The effect of narrative news format on empathy for stigmatized groups. Journalism & Mass Communication Quarterly, 89(2), pp.205-224.
[5] O'Brien, A. and Donelan, K., 2007. Risky business: Engaging marginalised young people in the creative arts. The International Journal of the Arts in Society, 1(6), pp.15-24.
[6] O'Toole, J., Burton, B. and Plunkett, A., 2004. Cooling conflict: A new approach to managing bullying and conflict in schools. Pearson Education Australia.
[7] Boal, A. 1974. Theatre of the oppressed.
[8] D'Ignazio, C., 2017. Creative data literacy: Bridging the gap between the data-haves and data-have nots. Information Design Journal, 23(1), pp.6-18.
[9] Bach, B., Riche, N.H., Carpendale, S. and Pfister, H., 2017. The emerging genre of data comics. IEEE computer graphics and applications, 37(3), pp.6-13.
[10] Claes, S., & Vande Moere, A. (2013). Street infographics: raising awareness of local issues through a situated urban visualization. In Proceedings of the 2nd ACM International Symposium on Pervasive Displays (pp. 133-138).
[11] Wolff, A., Barker, M. and Petre, M., 2017, June. Creating a datascape: A game to support communities in using open data. In Proceedings of the 8th International Conference on Communities and Technologies (pp. 135-138).
[12] Wolff, A., Knutas, A., Pässilä, A., Lautala, J., Kantola, L and Vainio, T. (2021). Designing SciberPunks as Future Personas for More than Human Design. CHI '21 Extended Abstracts, May 8–13, 2021, Yokohama, Japan