Data Walking

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1 PROJECT ABSTRACT AND RESEARCH PURPOSE

Data Walking is an ongoing research project exploring the potential of walking to gather data on the urban environment and then through multiple walks and visualisations build a rich picture of that area, acknowledging the plural understandings and experiences of the urban environment.

The project examines technology and tools for creative data gathering and experimenting with data visualisation, gain insight, and share knowledge, supporting civic participation and enquiry. Data Walking is a participatory and collaborative project, working with participants on walks and through creating visualisations, the project aims to engage participants on issues relevant to our communities, and empower those communities with new skills and tools to create new knowledge and new tools.

Data Walking can be conducted anywhere and examines the local while being global in reach through sharing practices and data across the internet.

2 BACKGROUND

Data Walking[1] began in London, 2015, exploring the potential of low cost technology to build a picture of urban spaces. An online repository[2] was created to store a year of walk data and the tools devised to gather it, so anyone could go on their own Data Walks.

I have conducted multiple workshops in different cities across the globe over the last five years to professionals, academics, and students, as part of research projects, conferences, and professional training. Each workshop has been a unique take on Data Walking due to the participants involved, the area explored, as well as constraints like available time and resources. A list of workshops and presentations can be seen here:
http://datawalking.com/workshops-presentations.html

In 2018 a report (see figure 1) was printed detailing the aims of the project, practical advice on tools and methods to start Data Walks or workshops, and featuring the visualisations of designers, educators and students who took part in the project. The repository was expanded to support the book, now available as a downloadable PDF.
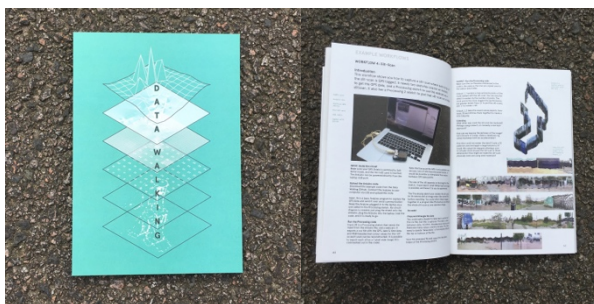

Figure 1: the Data Walking Report cover, and spread

3 WORKSHOP OUTLINE AND GOALS

In this workshop we will explore the host city, Manizales, and create interactive maps which display data gathered and insight generated by walking the city. Participants will define themes to explore, establish techniques to gather their own data, walk the city in a group(s) gathering data, and then learn how to turn that data into interactive online data-driven maps. Through multiple participants and perspectives we aim to build multiple and diverse understandings of the urban environment we walked. Ultimately participants will be learning how to conduct their own Data Walks and incorporate it into their own research methods and approaches.

4 WORKSHOP FORMAT AND SCHEDULE

This workshops is very practical and hands-on with all participants taking part in deciding the themes, gathering the data and visualizing it, either in small teams or solo (depending on number of participants) with myself on hand to assist with all stages of the day. The duration of the workshop should be a full day. I can accommodate between 4-30 participants. No prior experience is needed, and only a smartphone and laptop are necessary. If someone wishes to participate but does not have a laptop or smartphone it is possible to pair with someone who does have that equipment and work together. It is common and preferable to work in small teams on this workshop. Only a wifi connection and projector are needed to conduct the workshop.

A rough outline is below, but this can easily be altered to work with the conference schedule.

10am – Workshop and project introduction
10.30 – Team-forming and theme brainstorming
11 – Developing techniques for data gathering
12 – Walk! Explore Manizales and then have lunch
2pm – Process data
2.30 – Visualising data using Mapbox
5 – Quick presentations of maps and discussions of any insights, thanks to all participants, Q&A

More details and examples of a workshop brief can be seen here: http://datawalking.com/workshop.html

5 METHODOLOGY AND APPROACHES

Data Walking makes use of Open Source technologies but is platform agnostic and all techniques for data gathering and visualisation are encouraged.

GPS enabled microcontrollers and smartphones allow the accurate gathering of data by latitude, longitude and time are the crux of the method. With microcontrollers, a variety of sensors can be plugged in, or enable GPS data recording with another tool that normally has no facility to do so. Processing and other free software have been utilised in both data gathering and data visualisation, encouraging participants to engage with coding.

However, knowing the exact location and time of a datapoint are not essential to conduct a Data Walk, and successful workshops have not used this technology. Equally, many processes have not been code-driven. The project approach has evolved from looking at quantities to investigating qualities. This shift has been particularly evident and successful on

workshops which have primarily used smartphones due to their ubiquity and suitability for gathering in the field.

There is scope in this workshop to use a mixture of the above techniques, depending on the participants expertise and what they want to gather data on. I would recommend smartphone photography and note-taking as the first option for this workshop. Working with microcontrollers usually requires more than a one day workshop if participants want to learn how to program them.

Interactive maps with Mapbox have proven an excellent outcome as they are quick to make using data, easy to publish to the web and share, and the learning is highly transferrable to other projects.

Figure 2: Arduino with sensors held while walking in North Greenwich

Typical Data Gathering Methods
Arduino + sensors [light, temperature, sound] (see figure 2)
Smartphone photography
Note taking
Audio recording

Other Methods Explored
Object collection
Floor rubbings
Geiger counter radiation sensors
GPS enabled slitscans
3D capture with depth camera

Typical Data Visualisation Methods
Hand-sketched charts
3D printed charts and maps (see figure 3)
2D Charts and maps made with Processing (see figure 4)
Data-driven maps with Mapbox

Other Data Visualisation Methods Explored
Interactive 3D with Unity
Textile-based
Real-time light-based with Arduino + LEDs + sensors

Figure 3: 3D printed data cylinders

6 OUTCOMES

In this workshop there will be exhibitable interactive maps showing the data collected and visualised during the day by the group of participants. There will also be a dataset (or series of datasets) to be shared. The day will be documented and materials generated shared on the project website. It would be excellent to have a screen/space to exhibit the maps alongside the Situated Action/Exhibitions submissions to PDC2020.

7 CONTRIBUTIONS AND BENEFIT

As a hands-on workshop, participants will contribute a huge amount to the session and gain a lot as a result. The workshop is a micro-project in a day, and involves the full project process and workflow from defining the project, through research, and into delivery outcomes/prototypes ready for stakeholder engagement.

Participants benefit in terms of gaining an understanding and experience of Data Walking, data gathering techniques, and data visualisation platforms, all of which can be incorporated into future projects by the participants. Participants will also gain from having taken part in a collaborative session and expanded their network, fostering the potential for new collaborations.

Data Walking is a project aligned to the themes of understand plural understandings/realities in places by diverse groups, and a project that supports civic participation, empowerment through collaboration, learning, tool and process creation. Data Walking is a framework well suited to participatory design.

8 RECRUITMENT

I will post to social media to generate interest in the workshop from those attending the conference. No particular experience is required to take part. I would be interested to know if there are groups within Manizales who would want to take part in the walks as well. I am happy to work with the PDC Chairs to recruit and arrange the workshop, and communicate with potential participants important dates/information.

9 ORIGINALITY AND CONTEXT

Data Walking contributes to existing and ongoing work by many other practitioners and organisations[3] using walking combined with citizen science and environment sensors[4], quantified self[5], urban exploration[6], big data[7], flaneurism, co-creation and participation[8,9], community initiatives[10], data-driven design[11], design research and data ethics[12].

Data Walking fuses some of these aspects together to create a flexible and coherent workflow from data gathering, processing, and visualising for anyone with an interest in exploring urban areas through direct experience and expressing that with data visualisation.

Through overlapping skillsets, agile collaboration, Data Walking hopes to bring different disciplines closer together with creative data gathering methods and ambitious visualisations.
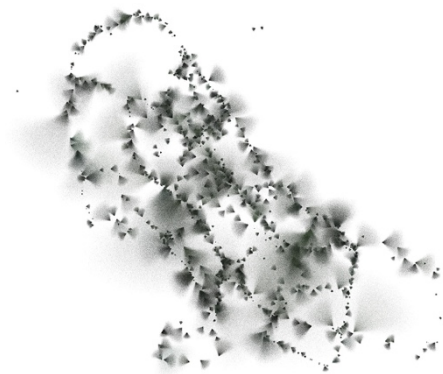

Figure 4: Map of green matter extracted from photos taken across the North Greenwich peninsula.

10 PRACTICAL IMPLICATIONS

By using Open Source technology and in turn sharing all the data, code-created tools, schematics for electronics, and workflows, this project and its transparent approach is about empowering those who want to explore urban environments through data gathering and visualisation regardless of expertise.

Data Walking makes use of a variety of tools and mediums and encourages practitioners to bring their own unique skillset and toolkit to the project. In this way a wide range of people from different backgrounds can participate with the project and potentially collaborate with one another, bound through a common interest/theme, common skillset, or a desire to learn new skills. With tools, data, practice distributed through the online project repository it encourages organic collaboration, collective research, and flattening of organization and networks.

While different technologies have been proven (or disproven) to be suitable for data gathering while walking, workshops (thanks to their focused time and diverse collection of participants) have raised some interesting discussion points and perspectives on urban spaces, and techniques for capturing and communicating their characteristics.

Figure 5: Participants in a workshop at Tatung University, Taiwan, showing a map created in Processing using Unfolding Maps Library

11 IMPACT

The project has had impact in different ways at different levels. The book has been distributed to designers, educators, journalists, and scientists in over 100 cities in 25 countries, and the GitHub repository of data and code is available to anyone. Feedback from those who have received the book has been positive, with many stating it has inspired them to start their own walks or try new methods and workflows.

There have been conference and industry presentations, as well as workshops. Workshop participants range from students to professionals (see figure 5). Methods and lines of inquiry into urban spaces have also been utilised in academic teaching on information, experience and service design projects.

REFERENCES

[1] http://datawalking.com/
[2] https://github.com/DHDPIC/DATA_WALKING
[3] M. Wieringa, K. van Es, https://datafiedsociety.nl/working-paper-walking-as-method-in-data-studies/, 2018
[4] E. Gertz, P. Di Justo, Environmental Monitoring with Arduino, 2012
[5] N. Felton, Feltron Reports, 2005-2014
[6] Data School, Utrecht University, https://dataschool.nl
[7] D. Quercia, https://researchswinger.org/
[8] J. Jarke, Open government for all? Co-creating digital public services for older adults through data walks, 2019
[9] L Tan, http://lingql.com/
[10] Olga Mecking, https://www.theguardian.com/cities/2018/nov/14/the-dutch-cities-using-walking-to-tackle-issues-from-vandalism-to-broken-streetlights, 2018
[11] A. Richardson, Data Driven Graphic Design, 2016
[12] A. Powell, http://www.alisonpowell.ca/