

End of Project Report for WSI Stimulus Fund

Project Title: Capacity building to enable longitudinal studies of online citizen participation systems.

Investigators: Dr. Ramine Tinati, Dr. Markus Luczak-Roesch, Dr. Kate Lyle

Project Outline

The rise of the Web has disrupted the way how knowledge bases are built and maintained or how the scientific process is pursued, offering new participatory approaches via human computation and crowdsourcing at a scale not previously imaginable.

A popular example is citizen science, the engagement of non-expert volunteers to contribute their spare time to help solving a given research challenge. Driven by their intrinsic desires to help, recent studies have shown that not only do citizen scientists dedicate many hours to the crowdsourcing tasks of these projects; they also invest their time in community activities and discussion. And it is exactly due to that interplay of task and talk commitment of volunteers, that a number of (sometimes totally unanticipated) citizen-led discoveries have been achieved. Hypotheses about the nature and makeup of these citizen-led discoveries range from the assumption that they are somehow serendipitous, up to accounting them to particular system and task design characteristics. It is clear that the socio-technical environment of the Web is crucial in allowing citizen scientists to flexibly draw upon information from various sources on their way towards the discovery, but it is unexplored *how* this is achieved and what such discoveries *mean* for the citizen scientists in the *longer term*.

Project Objectives

This project aims to deliver capacities for creating a centre for longitudinal studies in citizen participation systems by investigating citizen-led discoveries in citizen science projects as an exemplar case study. It will combine expertise in web science and social science to develop these methodological and technical capabilities. The investigators will

- (a) conduct a survey of known citizen-led discoveries,
- (b) undertake qualitative research, focussed on both users and online content, to explore how communities of citizen scientists engage with each other and other sources of information in the construct of this new knowledge and expertise, and
- (c) leverage existing collaborations with the teams behind two citizen science projects in order to develop a prototype of for a cross-platform citizen science observatory.

Outcomes

In order to address the three aims in this project described in the previous section, we have ran several parallel streams of work, which involved collaboration with external partners, and the paid support of student demonstrators.

Summary of Activities

- Addressing *objective (a)*, we contributed to a study of extracting the citizen-led discoveries which have been announced publicly. This was performed as a scoping exercise to explore the space of citizen science activity and scientific publication. As an outcome of this activity, we reported on the adoption and use of citizen science as a global phenomenon. This work was presented at the Second Winter symposium on computational social science.
- Working with collaborators who run and support the Eyewire citizen science project, we conducted a player study to examine how the platform facilitated interaction. The purpose of this study was to explore the engagement of citizen scientists as a community, we also wished to examine the transfer of knowledge from volunteer work to scientific findings. Supporting this work, two student demonstrators from the University of Southampton worked with the project

team in order to hand-code survey responses. This was subsequently used to work towards *objective (b)*; the results were analysed and formed the study of our CSCW2017 (submitted) article.

- An outcome of the EyeWire study also resulted in the production of a short form paper which was presented at the Collective Intelligence 2016 conference. This was also planned as an opportunity to meet with a number of the collaborators and potential partners in future funding proposals. We are currently in discussion with new a new contact (hila-lifshitzassaf, Associate Professor at NYU) who is interested in working with us the transfer of knowledge from a non-expert to expert community.
- In addition to conducting a survey asking players about their engagement with the EyeWire platform, we also had access to a corpus of chat log data which we worked with the same PhD researchers in sociology to identify the conversations and collaboration between players who use Eyewire's real-time chat console. This work, which will contribute to an ongoing study into "what citizen scientists really talk about" also forms the preliminary work required to inform our extended research proposal.
- Addressing *objective (C)*, we have made use of existing Web Observatory infrastructure in order to help develop the necessary technology and services to harvest different citizen science platform data. Working with a student from the Web and Internet Science (WAIS) group in Southampton, we have developed a set of tools to harvest and visualise various sources of citizen science activity and discussion. The tools have been developed under an open licence, and made available via the Southampton Web Observatory (data streams, and visualisations).

Academic Publications

The following publications have been supported by the activities of the work undertaken within this project:

- Tinati, Ramine., Lyle, Kate., Luczak-Roesch, Markus, Simperl, Elena, Hall, Wendy - EyeWire Analysis. CSCW 2016 (*submitted*)
- Tinati, Ramine., Luczak-Rösch, Markus, Simperl, Elena, Hall, Wendy., 'Because Science is Awesome': studying participation in a citizen science game. ACM International Conference on Web Science 2016.
- Tinati, Ramine., Luczak-Roesch, Markus. Lyle, Kate. Player Participation in Eyewire: A Gamified Citizen Science Platform. Collective Intelligence 2016 (CI-2016).
- Tinati, Ramine., Luczak-Roesch, Markus, Lyle, Kate., Hall, Wendy., Exploring the Global Adoption of Citizen Science. 2nd Symposium on Computational Social Science (2015).

Public Engagement

Project members have been invited to give several talks related to the ongoing work

Collaborations

This project has allowed us to strengthen existing relationships with collaborators who are developers of citizen science platforms, and academics who work within the field of crowdsourcing and citizen science. Based on the publications and attendance to several conferences and events, we have also been able to form new relationships with researchers in several academic institutes who are interested in working with us in the future.

Next Steps

The research conducted in the last 12 months has successfully opened up a number of exciting research questions which we intend to continue, subject to funding and participation from collaborators. We are currently looking developing our current findings to answer questions regarding:

- *Transfer of expertise, and acceptance of scientific discoveries:* As a result of our investigations and discussions with collaborators, we were led to ask questions regarding the space between non-expert participants, the transfer of knowledge to the scientific community, and the acceptance of this newly discovered, non-expert curated knowledge.
- *Global use and adoption of citizen science:* With access to several citizen science platforms which aim to attract a 'global' audience, we discovered that whilst citizen science is perceived as a global activity, data reveals that it is predominantly a western (European and North American) activity. We now wish to ask questions as to why this is (is it a socio-technical issue), and what can be done to improve this?
- *Best practices and technical infrastructure for capturing citizen science activities:* As a consequence of developing services to harvest and integrate various citizen science platforms, several research challenges pertaining to how data is captured, what metadata is used to describe it, and then the methods used to interpret, and visualise the data.

Budget

The resources were used to support the following activities:

Task Description	Start/End Date	Hours	Output/Work Completed	Cost
Coding of EyeWire 2015 survey. 4 Questions, 1365 responses. Coding to be conducted in NVIVO	01/04/2016	16	Completed coding schema and responses provided in a NVIVO file	232.32
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Research	01/11/2016 - 31/07/2016	112	Research/report writing/meetings	1805.44
Coding of EyeWire chat data	06/6/2016 - 06/07/2016	50	Qualitative Coded chat data	726
Research		50	Research/report writing/meetings	806
Data harvester for the EyeWire project	01/06/2016 - 31/07/2016	50	Data harvester for EyeWire	806
Conferences, Meetings, and Collaborative activities	-	-	-	5629.03
Research (20 hours month [Ramine Tinati])	01/08/2015 - 31/07/2015		Publications / Research / Development	4569.96
			Demonstrators (Total)	1996.64
			Staff Cost	7181.4
			Collaborations/Conferences	5629.03
			Total	14807.07