
MHC '18: International Workshop on Mobile Human Contributions: Opportunities and Challenges

Niels van Berkel

The University of Melbourne,
Australia
niels.van@unimelb.edu.au

Simo Hosio

University of Oulu, Finland
simo.hosio@oulu.fi

Jorge Goncalves

The University of Melbourne,
Australia
jorge.goncalves@unimelb.edu.au

Katarzyna Wac

University of Geneva, Switzerland
katarzyna.wac@unige.ch

Vassilis Kostakos

The University of Melbourne,
Australia
vassilis.kostakos@unimelb.edu.au

Anna Cox

University College London,
United Kingdom
anna.cox@ucl.ac.uk

Abstract

Ubicomp/HCI researchers are increasingly using smartphones to collect human-labelled data 'in the wild'. While this allows for the collection of a wide range of interesting data in authentic settings and surroundings, humans are notoriously inconsistent in the quality of their contributions. Improving the quality of data collected with mobile devices is a largely unexplored, but highly relevant field. The primary objective of this workshop is to share insights, ideas, and discoveries on the quality of mobile human contributions. The work presented in the International Workshop on Mobile Human Contributions (MHC '18) explores methods, tools, and novel approaches towards increasing the reliability of human data submissions with mobile devices.

Author Keywords

Human sensing; mobile devices; in situ; experience sampling; citizen science; crowdsourcing; data quality.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

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Rationale

Smartphones and other personal mobile devices have established themselves as popular and capable research artefacts over the past decade [16]. Studies relying on mobile data collection yield higher ecological validity than laboratory studies, allow for longitudinal data collection, and can use people's own devices to collect additional contextual data [2,16]. Such *in situ* studies, in which mobile devices are used to collect human-labelled data in authentic settings, in users' real life, are increasingly common [2,10,14].

Despite the fact that research findings rely on the underlying quality of the participants' contributions, the accuracy of human labelled submission through mobile data collection remains a surprisingly underexplored area. In this workshop, we raise the question: "*How to increase data accuracy in mobile studies?*" This could be either prior, during, or following the data collection.

MHC '18 aims to contribute to a better understanding of human accuracy in mobile data collection, and thus provide not only a set of examples how data quality can be improved but also a useful methodological contribution to the field of ubiquitous computing.

Background

While it is well-known that human accuracy is subject to fluctuation over time and across contexts [2], common practice is to consider all mobile human data submissions as both accurate and equal to one another. Despite the current lack of interest in the accuracy of human submissions in mobile sensing, ubicomp and related disciplines have a long history of studying and improving the accuracy of human data submissions. For example, situated crowdsourcing has made use of

public displays to increase human accuracy by tapping into highly specific contextual knowledge [9]. Similarly, citizen science has seen an increase towards Open Data, enabling citizens to verify existing data and to contribute to any gaps in the data. In self-report studies, many researchers have embraced mobile devices to present questions, but the use of mobile sensors to link participant context to data quality remains underexplored [2,6]. No previous efforts have brought together insights from these various related domains to specifically focus on improving the quality of mobile human-contributed data collection.

With this workshop, we hope to raise awareness to the topic of data quality when collecting contributions from people through their personal mobile devices. We set to contribute methods and means to understand and improve data quality, either by designing better studies or using different filters during data analysis and cleansing. Our goal is not to only raise awareness of this issue, but to explore novel ways in which human accuracy in mobile data collection can be captured, analysed, and improved in lieu of ground-truth data.

MHC '18

A total of 11 papers were accepted to the workshop, summarised below in alphabetical order. Van Berkel et al. [1] identify and categorise solutions aimed at increasing the accuracy of human contributions prior, during, and following data collection. Berrocal & Wac [3] present *Peer-ceived Momentary Assessment*, a data collection method utilising the collective assessments by trusted peers to improve the accuracy of self-assessments. Buschek et al. [4] propose *Information Transmission* as a new perspective on Experience Sampling, in which the subjective and objective

information channel cooperate to reduce potential noise in either channel. De Masi & Wac [5] present a pilot study in which they investigate application usage by collecting information immediately following participant usage of the application, allowing for a more detailed insight into user experiences and expectations. Exler et al. [7] discuss their experiences with a crowd-funded dataset, *CrowdSignals*, and present lessons for future crowd-funded data collection efforts. Gong et al. [8] present *LBSLab*, a mini-application that runs inside of the popular mobile application WeChat. LBSLab allows for the collection of location-based information and offers an incentive mechanism to retain participants. The work by Liang et al. [11] explores the use of a blockchain mechanism to verify crowdsensing tasks, reducing the possibility of attacks and frauds. Maharjan et al. [12] collect and visualise contextual (smartphone) data in conjunction with ECG data to improve accuracy in ECG interpretation. Manea & Wac [13] propose *mQoL*, a mobile application which allows researchers to conduct longitudinal Quality of Life studies with a focus on scientifically valid data. Oppenlaender et al. [15] present *CampusTracker*, a mobile application build to assess a crowd's momentary willingness to work on paid crowdsourcing tasks. Finally, Schmidt et al. [17] offer guidelines to increase the accuracy of self-report data collected in Affective Computing-field studies.

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