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Gamifying Research: Strategies, Opportunities, Challenges, Ethics

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Abstract
From social sciences to biology and physics, gamified systems and games are increasingly being used as contexts and tools for research: as "petri dishes" for observing macro-social and economic dynamics; as sources of "big" and/or ecologically valid user behavior and health data; as crowdsourcing tools for research tasks; or as a means to motivate e.g. survey completion. However, this gamification of research comes with significant ethical ramifications. This workshop therefore explores opportunities, challenges, best practices, and ethical issues arising from different strategies of gamifying research.

Keywords
Gamification; games with a purpose; games for science; game analytics; crowdsourcing; citizen science; mapping principle; research ethics

ACM Classification Keywords
H.5.m [Information Interfaces and Presentation]: Miscellaneous; H.5.2 [User Interfaces]: Evaluation/Methodology, Theory and Methods; K.8.0 [Personal Computing]: Games

Introduction

Gamification, the use of game design elements in non-game contexts [9], is being rapidly adopted across industries and domains [19]. One such domain is research itself: Early on, market researchers became interested in gamifying surveys and other online market research tools to increase participant motivation and thus, survey completion rates [6,11,13]. Gamified self-tracking applications are viewed as a major means of generating crowdsourced large-scale health data sets [22]. Participatory sensing platforms have also explored gamification to motivate citizens to collect pollution and green behavior data [17,20,23]. Maybe most prominently, "citizen science games" [7] or "games with a purpose" [24] like Foldit, Galaxy Zoo or EyeWire have used the engaging qualities of games to mobilize millions of citizens to contribute their time and cognitive resources and solve computationally hard-to-automate information tasks like protein folding or image recognition. Based on the observation that in-game behavior often "maps" onto "real life" behavior far more closely than commonly thought [28], other researchers have explored using games as giant "petri dishes" for macro-social and macro-economic dynamics [4,5,27,28] or as platforms to collect ecologically valid granular datasets [3,12].

The potential benefits of using gamified systems and games for research are manifold: their engaging nature can increase participation; as computational environments, they allow automatic fine-grained tracking and manipulation; they can generate large-scale data sets; and deployed on personal tracking devices, smart phones, or through the browser at home, they can collect ecologically valid behavior data. However, many empirical studies involving gamified systems show significant methodological shortcomings [15] and face questions like potential selection effects and biases introduced by game design elements [6]. There are no established best practices so far.

In addition, while there has been some discussion in research communities around research ethics for online and virtual environments [1,2,18], the recent controversy around the Facebook emotion manipulation study [14,16] showed that large-scale experimental manipulation and tracking of user behavior – characteristic for using games and gamified systems for research – opens new (or newly relevant) ethical issues [3,25,26]: Does the playful veneer of games and gamified systems lead users to unwittingly share more data than they otherwise would? How can they be made aware of and give informed consent to tracking, experimental manipulation, and the third party use of their data? To what extent might data or cognitive resource contributions in science games present exploitation [29]? How to ethically handle collaboration with industry partners collecting data?

Workshop Goals

Against this background, we see an immediate need to bring together HCI and game researchers as well as industry practitioners and ethicists to (a) advance the practice of using gamified systems and games for research by mapping current strategies and best practices, opportunities and challenges, and (b) chart ethical issues and potential solutions in a dialogue between academia, industry, and ethicists. Whereas previous workshops [8,10] focused on understanding and designing gameful systems, respectively, this workshop explores how to use gameful systems and games in research in an ethical manner.

Workshop Questions

- Strategies: What established and new forms of gamifying research exist? What are methodological best practices and open questions?
- Opportunities: What untapped opportunities do gamified applications and games provide as research contexts and tools? What special kinds of data can they deliver, what kinds of research questions can they uniquely answer?
- Challenges: Are there audience selection effects, data biases, or other specific challenges in using gamified systems and games as research contexts and tools?
- Ethics: What ethical issues arise in gamifying research? What are ways and tools for designing ethically conscious gamified research?

Participants and Expected Interest

This workshop is of immediate interest and relevance to HCI researchers and practitioners who conduct research with or in gamified systems or games, as well as technology sociologists and ethicists working on the ethical challenges of research in online and virtual environments.

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