
Exploring and Expanding Ethics in IoT Development

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Abstract

With this paper we wish to open a discussion about ethics in IoT development. Following on from an attention towards how the world is increasingly populated by things that participate in our social lives we point to whether this may have implications for how we approach and understand ethics in IoT. We are currently engaging ethics among developers of IoT technologies as a continuous practice interwoven with the material environment in which it plays out. These reflections will - hopefully - spark discussion about how ethics in the field of IoT might not solely be a human affair, but a more than human matter.

Author Keywords

The Internet of Things; ethics; design processes; observational studies; qualitative;

ACM Classification Keywords

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Introduction

Internet of Things (IoT) sensing technologies that collect and algorithmically process data have a growing impact on the way we inhabit the world. The increasing

role objects play in shaping and transforming our practices invite us to move beyond anthropocentric assumptions about the world [3] and offer opportunities for researchers, designers and developers to reconsider the particular and situated ways in which IoT technologies materially inhabit and socially share our lives [8]. The proliferation of IoT represents an unprecedented potential for integration of connected experience (via sensors and networked data) into everyday life - thus providing a way to frame the notions of offline and online as neither blurring or in opposition, but as a coherent daily experience. As IoT devices, such as Amazon's Echo for example, begin to enter people's homes en masse we witness a significant misalignment of values between those embedded within technologies and those of their users.

While there is much to be gained in exploring the user relation with IoT to understand how these devices intervene upon and inter-act within the social fabric of the home, our concern is in the ethics and moral reasoning involved in the design of IoT devices and the kinds of values that come to be embedded within. Focusing on how designers see the world for which they design may tell us a great deal about the potential futures of IoT technology and the possibilities of "object-centered sociality" [8].

The VIRT-EU¹ project takes its departure in the idea that a focus on ethics and the morality of action in the process of technology development is a productive avenue of inquiry. New technologies reconfigure existing power dynamics embedded in social structures,

¹ Values and Ethics in Innovation for Responsible Technology in Europe (VIRT-EU) project (launched in January 2017), received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727040

which means our ability to rely on pre-existing rules and to predict potential consequences falters. Thus developers must rely on a more intuitive sense of right and wrong - the sense that emerges as a result of collective negotiations of morality of action. Ethics then is not something that can be engaged at the end of a design process, nor a set of outcomes against which design decisions ought to be measured, but a process in itself.

VIRT-EU takes a pro-active normative stance, acknowledging that rapid IoT development raises ethical questions where the most prominent evolve around privacy, citizen rights and data protection as reflected in recent European policy efforts such as the EU General Data Protection Regulation. Our goal is to understand what kinds of ethics are enacted in the process of technology development or in the debates and discussions on IoT forums, in hacker spaces and at IoT conferences and meet ups. We argue that by following the daily practices of developers we can identify whether and how to intervene in the development process and do so through co-design of tools for ethical reflection that can connect enactments of ethics with the European policy frameworks.

In what follows we consider the notion of 'the social' as discussed in current IoT research and its implications for how we approach and conceive of ethics. We then discuss the aims of VIRT-EU and what we bring to the workshop as a position and as a request for feedback and input.

Engaging the Social in IoT

Current IoT research calls attention to how a human-centred notion of sociality is challenged as objects begin to act with ever more obvious agency,

intervening in the social fabric of what is traditionally thought of as “human” practice [8]. Anthropocentric assumptions about the world simply can no longer hold even in contexts where “object-centred sociality” is epistemologically foreign.

The world in which we live is increasingly populated by arrangements and assemblages of human beings and technological artifacts that contribute actively to our practices and experiences. As Verbeek states: ‘Humans are technological beings just as technologies are social entities’ [10]. As an example Verbeek describes how speed bumps help us make decisions about not driving too fast which makes him question whether we can conceive of ethics as a matter confined to humans [3].

Design Ethics

In much of design practice ethics is an ongoing concern [7,9]. Since technologies mediate behavior prominent ethical reflections address what kinds of agency are being produced [9] or what values are cultivated [4]. Some describe design as an inherently ethical activity [6] where designers are ‘practical ethicists’ using matter as a medium of morality [10] which is why designer, artifact and user should be the focus of moral evaluation together [5].

“The material ethics of design,” however, remains rather implicit [10]. Commonly considered to be an exclusively human affair ethical theory does not leave much room for the role of materials. Technologies contribute actively to how humans *do* ethics, but due to the humanist orientation of established frameworks for ethical theory it is hard to conceptualize the way our actions are always closely interwoven with the material environment in which they play out [10].

Verbeek suggests that: ‘Rather than approaching ethics and technology as belonging to two radically separate domains, one human and the other nonhuman, we should keep the interwoven character of the two spheres at the center’ [10]. Designers and users can be conceptualized as ethical subjects in becoming through ordinary activities in this intertwinement [10].

Exploring Ethics in IoT Design Processes

In VIRT-EU we follow Verbeek in the belief that designers are ethical subjects in continuous becoming through their ordinary activities. In exploring this ethical enactment among IoT developers an attention towards how our actions are interwoven with the material environment in which they play out is notable..We ask how can we help designers deal with the ethical implication of their design practices in a responsible way?

Taking as a given that social transformation is possible through ordinary activities, we acknowledge that ethical reflection and moral reasoning require support and grounding. One of the aims in VIRT-EU is to co-design tools together with developers that will support ethical reflection as part of the design process. This is only possible if we are able to take into account the enacted ethics of developer communities. Thus the first stage of the project is to empirically ethnographically engage with the ethics that is already enacted among a range of potential participants like developers, makers, hackers, IoT entrepreneurs, social innovators and community organizers. Addressing and engaging the social in IoT then engenders paying attention to the sociality of objects as well as to the sociality of their creators and the interwoven nature of technology development and use practices and the material environments of these practices.

We are currently in the midst of designing an ethnographic inquiry to examine this where potential fieldsites are to be located in European communities engaged with designing IoT technologies beginning with maker- and hackerspaces, start up accelerators and IoT meet up events. Our hope is to ensure an ethnographic sensibility oriented towards how ethics might not only be a human affair. In current research *design things* are described as bundles of people and materials that are intertwined and drawn together in both the process of design and ongoing in the process of appropriation [1,2]. Hence, by participating in the things, designers position themselves in more than human collectives [2] and there are opportunities for extending such participatory design considerations in the contexts of IoT [8]. Here not only users, but also designers themselves are part of a sociality where the things they design are active participants in their ordinary activities and hereby part of their ongoing ethical practice.

VIRT-EU as a project is in its starting phase and we look forward to feedback and critique. We submit that to engage with the social IoT we must acknowledge and address the underlying ethical and moral reasoning. Where theory at times can get too removed from the banalities of practice, practice at times needs theory for the language enabling us to address the potential of new technologies and old concerns. The goal of VIRT-EU is to affect the practice of IoT development to ensure better alignment of values between the technologies and users, bridging theory and practice.

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