

Uses and misuses of connected devices

3 – 4 April 2019

Gilad Rosner — Permission / Permissioning / Permissionless: Three Faces of IoT Evolution

This talk will explore 'permission' in the IoT from three perspectives. Firstly, that active consent and permission is further breaking down, leading to challenges to 'boundary management.' Second is a review of the technologies of 'permissioning' — frameworks and protocols from the identity management domain that enable users to grant granular permissions to share data. Third is a critique of the 'permissionless innovation' discourse within IoT policy discussion, which views government intervention into the developing IoT market as a hindrance to innovation, and decries precautionary approaches to regulation.

Alison Powell — Doing, Postponing and Evading Ethics: the politics and economics of ethics in IoT startups

The VirtEU Project has been investigating how people working in small, emergent organizations (startups, small companies and collaborative work spaces) work through ethical issues and dilemmas in the development of their products and their relationship with the European policy and innovation landscape. Using a framework focused on virtue, capability and care we test out ideas about how, when and with whom companies can act ethically. We have discovered that most small companies have an understanding of ethical issues, but that the way that ethics has been presented through existing policy and tool development remains disconnected from the experiences that IoT entrepreneurs and others have with ethics issues. This presentation presents fieldwork insights on 'doers' and 'postponers', two kinds of positions that people take in relation to ethics. It also outlines how virtue, capability and care perspectives can complement the other ways that ethics of connected objects are discussed.

Lachlan Urquhart — TBC

Alexandra Dechamps-Sonsino — Better IoT: It's not just about the data

Better IoT is a community led effort to educate startups in approaching the design of their products with ethics in mind. The talk will outline the different components of this tool with a particular focus on the complex role of privacy.

Phillip Stanley-Marbell — Hardware Privacy Guards for Integrated Sensor Systems

Sensor integrated circuits are fundamental building blocks in mobile phones, wearable health-monitoring devices, and more. They often have interfaces which permit software to request sensor data at selectable sample rates, selectable sample precisions, and other signal acquisition settings.

Malicious software can abuse these interfaces to violate the privacy of users by requesting higher sensor data fidelity than they truly require. Attackers can use counterfeit sensors to further subvert privacy and security. And sensors can generate physically-implausible values: such erroneous sensor outputs can cause algorithms to make implausible inferences.

This talk presents preliminary work on characterizing sensors based on their output data and using information about the physical constraints imposed on signals by physics, to validate sensor output for improved security and privacy.

Grace Annan-Callcott — Connected devices and designing for safety

When people talk about data protection or security it's easy to slip into vocabulary associated with the military, such as breaches, hacks and attacks. In this context, it's difficult to understand how an individual has agency; it is a topic disconnected from the everyday reality of life today. Is it perhaps more helpful to look at data protection through a lens of designing for safety? We'll explore what needs to exist to build a safe system around production of connected devices, to make sure people can trust them in the future.

Adriana Lukas — TBC

Richard Mortier — On the Edge of Human-Data Interaction with the Databox

We are all the subjects of data collection and processing systems that use data generated both about and by us to support many services. Means for others to use such data -- often referred to possessively as "your data" -- are only increasing with the long-heralded advent of the Internet of Things just the latest example. Simultaneously, many jurisdictions have regulatory and statutory instruments to govern the use of such data. Means to enable personal data management is thus increasingly recognised as a pressing societal issue.

We previously formulated a notion of Human-Data Interaction (HDI) in an attempt to bring some structure to the space. This resulted in the Databox, a platform enabling an individual data subject to manage, log and audit access to their data by others. The fundamental architectural change Databox embodies is to move from copying of personal data by others for central processing, to distribution of data analysis to a subject-controlled edge platform for execution. This provides a basis for data subjects to obtain HDI's legibility, agency and negotiability in the use of their data. I will introduce HDI, and present the Databox platform design, implementation and current status. For more information, see <https://www.databoxproject.uk/> or join the discussions at <https://forum.databoxproject.uk/>

Paul Coulton — Prototyping Alternate Presents and Plausible Futures for IOT using Design Fiction

The potential economic and societal benefits of emerging technologies such as the Internet of Things is ultimately linked to their adoption and acceptability by a majority of potential users. However, the processes that drive them are rare considerations for

research into emerging technologies and are often framed as someone else's future work. This means challenges and barriers to adoption and acceptability occur only after potentially problematic design patterns have become established, resulting in diminished impact or unintended consequences. In this talk I will illustrate how Design Fiction can be used to go beyond considerations of usability and utility to explore a range of complex societal issues.

Ewa Luger — Ethical Systems by Design?

Antti Silvast — Who 'Uses' Smart Grids?

This presentation addresses the anticipated use and users of smart energy technologies and the contribution of these technologies to energy sustainability. It focuses on smart grids and smart energy meters. Qualitative accounts given by European technology developers and experts reveal how they understand the final use and social impacts of these technologies. The presentation analyses these accounts and compares the UK's smart meter rollout with experiences from other European countries, especially Finland, to provide insights into the later adoption stages of smart energy and how its impacts have evolved. The analysis highlights significant differences in the likely intensity and manner of user engagement with smart grids and meters: depending first on whether we are considering existing technologies or smart technologies that are expected to mature sometime in the next decade, and second on whether the 'user' is the user of smart meters or the user of an entire layer of new energy services and applications. This examination of user representations can point out the need for further technology and service development if some of the envisioned user profiles and user actions appear unrealistic for presently available technologies.

Silvast, Antti, Robin Williams, Sampsa Hyysalo, Kjetil Rommetveit, and Charles Raab. "Who 'Uses' Smart Grids? The Evolving Nature of User Representations in Layered Infrastructures." *Sustainability* 10, no. 10 (2018): 3738.