Strengthening human autonomy in the era of autonomous technology.

Contemporary perspectives on interaction with ‘autonomous things’

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ABSTRACT

The aim of this workshop is to address the role that *human autonomy* presently receives in HCI research and how “autonomous technologies” might challenge, rather than facilitate human autonomy. We acknowledge a need for new ways of understanding HCI and interaction design as digital technologies develop in the “4th wave”. In this workshop, participants are invited to a discussion where the autonomous human-being—who can act autonomously with autonomous technologies—is emphasized, beyond simple human control to a more flexible, sophisticated, subtle, and sustainable autonomy.

CCS CONCEPTS

• Human-centered computing; • Human-computer interaction; • HCI theory, concepts, and models;

KEYWORDS

human autonomy, autonomous technology, design implications

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1 INTRODUCTION

We know that technological development often opens new areas of application. The latest technological advancements in AI and ML open up for increasing the range of application areas (i.e., areas for automation) as well as the levels of automation. HCI-researchers have referred to socio-technical shifts as paradigm shifts [1] or waves [2–5], emphasizing that the waves coexist like generative metaphors [6]. The previous three waves: (1) human factors and ergonomics, (2) symbolic information processing, and (3) networks and mobile computing, consumer technologies, human experience,

and user participation have been accompanied by a change in the theoretical basis for understanding interaction from psychology via cognitive science to a wider range of disciplines including philosophy (e.g., phenomenology [7]), social sciences (e.g., situated action [8, 9]) and design [10, 11]. Current discussions of the future development of HCI include human-computer entanglement [12] and integration [13, 14] the computer as a partner [15], and political positioning [16–18]. We are particularly interested in discussing the challenges to HCI by a set of relatively new technical possibilities: autonomous technologies.

In an already complex and cluttered environment, the combination of these three waves has further complicated our environment as it becomes populated with physical and virtual systems. Now, more than ever, digital systems and artifacts get more entangled with almost all aspects of societal life, and autonomous (and ubiquitous) technologies add to the number of things we interact with in our daily lives: the digital permeates society. Autonomous technologies appear as self-directed and/or self-sufficient [19]: they do their things without explicit instructions from a human. Digital artifacts or systems that are “artificially intelligent” (AI) or use “machine learning” (ML) and neural networks to make decisions often operate outside the reach of human interventions; they are imperceptible as we cannot always know what they do or why they do it. In the light of the new kinds of interactions offered by the latest technological advancements, this workshop particularly addresses human autonomy, focusing on the individual humans and their autonomy and self-determination as the overall goal for HCI. How can we, as researchers and interaction designers, understand, evaluate, and describe human-technology interactions in an increasingly complex and technologically diverse environment? The aim of this workshop is to address the role that human autonomy presently receives in HCI research, and how we can ensure that this perspective gets proper attention as autonomous technology advances beyond (the average) human understanding.

2 THEMES FOR THE WORKSHOP

With our main interest being ‘autonomous technologies’ and how they might make the interaction imperceptible, challenging rather than facilitating human autonomy as a background, this workshop focuses on the role of human autonomy and the right of the individual to govern their own lives. We want to explore interaction goals, relevant theories, methods, relations between the human and the computer, and relevant values and questions for these technologies, potentially defining a shift in HCI. We are particularly interested in

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discussing the following themes but are also open for other takes on our main questions.

2.1 Imperceptible interactions

Interactions that we cannot directly perceive (see, touch, feel) or understand (the mechanisms behind the technology is hidden) such as; smart environments and homes, ML algorithms and predictive technologies, robot “decisions”. How do people (users and designers) relate to and understand autonomous technology when they cannot sense or make sense of its operations (see e.g., [20])? How can we design for human autonomy when the human does not know s/he interacts or what the autonomous technology does? How do we describe and critically consider being an involuntary user of autonomous (and ubiquitous) technology? How can humans relate to autonomous and/or imperceptible ‘things’ – or how do we describe the human-thing and subject-object relations?

2.2 Interaction with autonomous things

Interaction with robots, (chat)bots, or smart vehicles. We have seen that with the introduction of a robot in a domestic setting, humans need to carry out facilitation [21, 22] or articulation work [23–25]. How do we describe how we relate to technology that performs tasks for us and with us? How do people handle having autonomous or automatic things as “colleagues” or “partners” in work where work tasks are distributed or shared by humans and technology? How do people whose workflow includes AI/ML-based decisions relate to the automatic decision-making process? What is a good mix or fit between machine and human decision-making?

2.3 Perspectives on “imperceptible interactions with autonomous things”

We welcome philosophical and theoretical perspectives on human autonomy in today’s society and how technology can strengthen human autonomy. How do we describe and critically evaluate the different ways that technology represent, protect, and support or weaken human autonomy? Within this theme, we include questions about how we can design these interactions, i.e., how to design for capabilities [26], prolonged mastery [27], or situated abilities [28, 29], how to design for perception and meaning-making when imperceptible interaction is the basis, how to design for interaction with moving things like robots [23, 24, 29, 30] or autonomous vehicles? We also think that a debate about the (human) values and foci of the 4th shift in interaction design / HCI is timely, as are possible mechanisms and design concepts for increasing human autonomy [31].

We wish to further explore interaction goals, relevant theories, methods, relations between the human and the computer, and relevant values and questions for these technologies, potentially defining a shift in HCI.

3 OUTCOME

With human autonomy as our primary perspective, we invite participants in this workshop to discuss how recent technological developments change the core of HCI, and how we want to envision this field as it moves forward: how to design, evaluate and implement interactive systems that enable people to govern their

own lives. By emphasizing the importance of human autonomy in a technology-driven society, the challenges we as a community face will become clearer, and thus possible to address and tackle. Presently, the challenge of preserving human autonomy during the next socio-technical wave has not been addressed in the NordiCHI community. Further, such perspectives are much needed if HCI should renew itself and its theoretical basis, while simultaneously maintaining our Scandinavian tradition and Nordic values.

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