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2nd International Workshop on Designerly HRI Knowledge. Reflecting on HRI practices through Annotated Portfolios of Robotic Artefacts.

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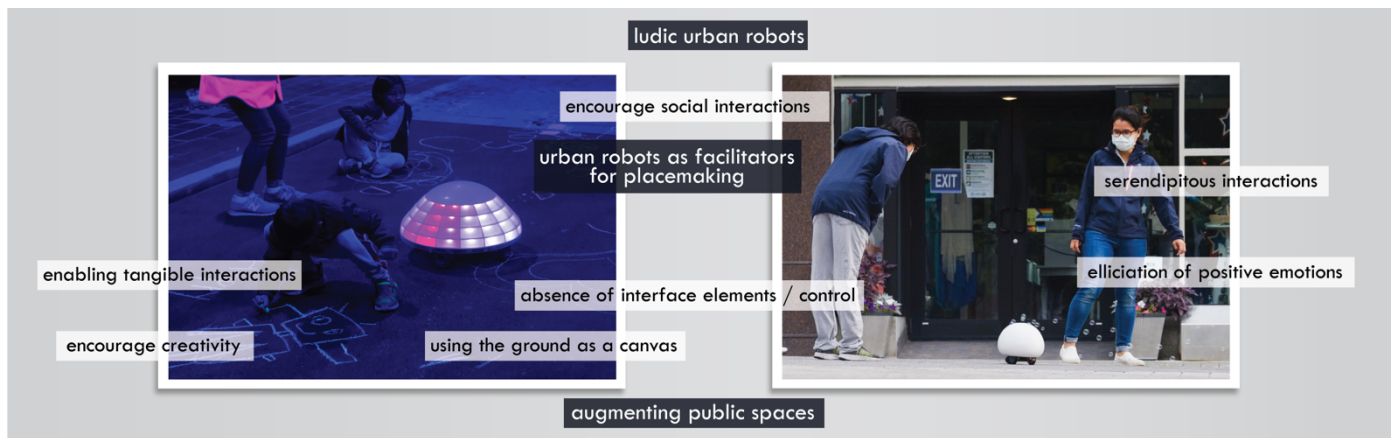


Fig. 1. An example of Annotated Portfolio of robotics artefacts from the article “Eliciting New Perspectives in RtD Studies through Annotated Portfolios: A Case Study of Robotic Artefacts” by Hoggenmüller et al., 2021

Abstract— We propose a workshop stemming from ongoing conversations about the role of design methods and designed artefacts within the field of Human-Robot Interaction (HRI). Given the growing interest in understanding what the field can learn from design explorations, the workshop focuses on hands-on annotating activity where participants (researchers and practitioners from HRI, Human-Computer Interaction, and Design Research) will analyze and reflect upon selected collections of robotic artefacts. Ultimate goal of the workshop is to explicate values, concepts and perspectives that usually remain tacitly embedded in the designed artefacts and, as such, hard to appreciate as proper HRI contributions. The expected outcome of the workshop is a set of methodological recommendations and concrete examples of what kind of knowledge can be generated through robotic artefacts.

Keywords— *Designerly HRI, Robotic Artefacts, Annotated Portfolios, Intermediate-Level Knowledge*

I. INTRODUCTION

The HRI field generates numerous ‘artefact-centered papers’ [1]. Yet it has been shown that this type of work generally has a lower impact in the field [2]. In this regard, some scholars (e.g., [3; 4; 5]) started to stress the importance of understanding design explorations—works characterized by the use of design methods and/or the development of an artefact—and their potential for the

field of HRI. At the same time, they also all raise questions regarding the challenges of explicating the actual contribution of design explorations. Running ‘traditional’ study-based evaluations, in fact, may not always be the most meaningful way to elicit the value of these types of work. Such critique, however, opens up questions that the design research field itself is still trying to answer [6], such as *how do we learn from robotic artefacts and design explorations? If there is already a body of untapped knowledge in HRI, what can it tell us about the field and the way we should/could approach it?*

To answer these questions, Lupetti et al. [4] advocated that HRI should focus on generating intermediate-level knowledge and suggested Annotated Portfolios—collections of designs that are represented through a medium appropriate for communication (e.g., a booklet accompanied by brief annotations) [7]—as a way to surface knowledge. In the act of annotating, in fact, designers make their reasoning regarding a specific design space explicit. They abstract features of a specific artefact to suggest dimensions of the design that can be applied more broadly [8]. These dimensions can greatly vary from concerns about functionality, aesthetics, and the practicalities of the artefact’s production, to the motivation for making, the identities and capabilities of the people for whom the artifact is intended, and the sociopolitical concerns

surrounding it [8]. In this workshop we propose to make use of Annotated Portfolios as a way to learn from existing robotics artefacts and generate design knowledge relevant to the HRI field.

The aim of the workshop is to critically engage with existing HRI artefacts and unpack how these might help the HRI community to go beyond some of its ‘traditions’ (e.g., evaluations mostly based on user studies [9] and dominant assumptions [10]). In fact, the main contribution and influence of artefact-centered work does not necessarily reside within the results of their user studies but rather within the way their embodiments and behaviors challenge what we believe a robot should look, act, and be like [4].

Bringing and applying Annotated Portfolios in HRI, however, come with its own methodological challenges. In the workshop we will address four methodological questions: (i) *should annotated portfolios only be performed by the designers of the robotic artifacts or can they be performed by external observers/reviewers?* If the latter, (ii) *could even the audience, the layperson, be a source of relevant annotations?* If so, *how would the emerging knowledge differ?* (iii) *And, how does the emerging knowledge relate to other intermediate-level knowledge forms, such as design patterns and strong concepts?* Finally, given the uniquely dynamic nature of robots, (iv) *are pictures a meaningful medium for reflecting on artifacts of which movement is often a most characterizing aspect of interaction? Or, should we rethink the format of the Annotated Portfolio to meet the uniqueness of HRI artefacts?*

Through the workshop, we will engage with these questions as well as with the general open challenge of understanding the relationship between design and emerging application domains [11] that characterize the act of annotating artefacts. We will extend previous existing work on the topic (e.g., Hoggenmüller et al. [12] arguments about expert annotations as a form of a creative and generative peer critique that can facilitate discussions about the contributions of designerly approaches to technology and science-driven domains, such as HRI). Our scope is to advance the disciplinary knowledge of design by investigating its potential contribution to other disciplines; while revealing the HRI values and perspectives that usually remain tacit and embodied in artefacts.

II. WORKSHOP OVERVIEW

The full day workshop (approximately 6 hours) will be organized in 4 sessions combining talks from both selected and invited speakers with hands-on activities. In particular, we would like to have a “hands-on” workshop, where participants attempt to extract the HRI design knowledge from both their own and other people’s work. To do so, we will use the methodology of Annotated Portfolios as a way to learn from robotics artefacts and generate actionable HRI knowledge from the vast implicit knowledge that already exists in the field. The talks will be online, and the activity can be either online or in-person depending on the conference’s decision about the format. If the former, we will use virtual collaboration tools such as Miro or Mural.

A. Audience and Participation

We will invite researchers and practitioners from Human-Robot Interaction and Human-Computer Interaction fields, Design Research and any other discipline relevant to HRI and who are interested in learning more about the conceptually generative power of design and Annotated Portfolios methodology to join us. Participants will be asked to submit a 2-5 pages-long position paper (pictorial formats will be encouraged) articulating their critical perspective on one or more of robotic artefacts of their choice (including their own work). Participants will be recruited through a public call for position papers, that will be disseminated through relevant academic mailing lists (i.e., CHI-announcements and robotics-worldwide). Selection will be based on the position papers’ peer review. We aim to have a maximum of 20 participants presenting a position paper, also to guarantee a high interactivity during the hands-on session. All conference participants will be welcome to join the workshop as audience.

B. Schedule and Activities

Session I: Introduction & Position Paper Presentations

Maximum 20 presentations from selected participants.

Duration: 90 minutes

Session II: Keynote Speaker & Hands-on Activity

Keynote speaker: Jonas Löwgren

Keynote Topic: Introducing design knowledge production and the concept of Annotated Portfolio

Activity: Annotating collections of robotic artefacts

Duration: 90 minutes

Session III: Lightning talks & Panel

Lightning talks: presentations from collection owners

Panel: collection owners and selected participants discuss concepts and themes emerging from the hands-on activity

Duration: 90 minutes

Session IV: Wrap-up

Workshop organizers wrap-up the workshop with concluding remarks and next steps. Participants will be invited to share their expectations for future Designerly HRI initiatives.

Duration: 15 minutes

C. Invited Speakers

The workshop will involve two types of invited speakers. A prominent representative of the design research field will be invited to introduce and explain the concept of intermediate level knowledge, how we can learn from artefacts, and the concept of Annotated Portfolio in a 30 minutes keynote speech followed by Q&A. Representatives of the HRI field will be involved as collection owners and invited to discuss their robotic artefacts and design approaches through 15 minutes lightning talks followed by Q&A.

Keynote speaker: Jonas Löwgren is professor of interaction and information design at Linköping University, Sweden. He specializes in interactive visualization, collaborative media design, and the design theory of the digital materials. He authored several seminal papers about intermediate-level knowledge in design, some specifically focusing on Annotated Portfolios and Strong Concepts, central topics of this workshop proposal.

Collection owner I: Guy Hoffman is an Associate Professor and the Mills Family Faculty Fellow in the Sibley School of Mechanical and Aerospace Engineering at Cornell University. He developed several robotic artefacts characterized by non-anthropomorphic embodiments and expressivity.

Collection owner II: Wendy Ju is an Associate Professor at the Jacobs Technion-Cornell Institute at Cornell Tech and in the Information Science field at Cornell University. She developed several robotic artefacts that blend robotics with everyday things and practices.

Collection owner III: Sonya Kwak is a Senior Researcher at the Center for Intelligent & Interactive Robotics in Korea Institute of Science and Technology (KIST). She developed several robotic artefacts that combine practicality with emotion elicitation.

III. WORKSHOP ORGANISERS

Maria Luce Lupetti is an Assistant Professor at the Faculty of Industrial Design Engineering at TU Delft. Her research explores the role of critical design approaches for the development of responsible and desirable artificial agents.

Cristina Zaga is an Assistant professor at the Human-Centered Design Group (Design and Production Management department) and at The DesignLab at the University of Twente. Her research focuses on design methods for embodied AI and interactive agency.

Nazli Cila is an Assistant Professor at the Faculty of Industrial Design Engineering at TU Delft. Her work combines interaction design with cognitive/social psychology and humanities to investigate philosophical, practical, and ethical issues surrounding collaborations with artificial agents.

Michal Luria is a Research Fellow at the Center for Democracy and Technology, and has recently completed her Ph.D. at the Human-Computer Interaction Institute at Carnegie Mellon University. Her work makes use of RtD and Speculative Design approaches to explore future interactions with social robots and other forms of emerging technology.

Marius Hoggenmüller is a Ph.D. candidate in the Design Lab at The University of Sydney. His work focuses on prototyping and probing urban interactions with robots and autonomous systems, thereby applying RtD methods and Media Architecture principles.

Malte F Jung is an Associate Professor in Information Science at Cornell University. His research focuses on design and behavioral aspects of human-robot interaction in group and team settings. He seeks to build understanding about interpersonal dynamics and how machines can shape them.

IV. DOCUMENTATION AND DISSEMINATION

The workshop aims to generate knowledge and materials that could be valuable for the conference attendees, and beyond the conference to the entire HRI community. We plan to record the talks and make them available on the workshop website. A summary of the materials produced during the hands-on activities will be made available on the website. Finally, we will consider disseminating the results of the workshop through a dedicated journal article.

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