Third International Workshop on Worker-Robot Relations

Futuring Worker Empowerment through Worldbuilding around Human-Robot Interactions

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Abstract

Building on two previous workshops on transdisciplinary practices for shaping worker-robot relations, this half-day workshop introduces participants to *worldbuilding*, a design-driven technique used to co-create and explore richly detailed futures, as a way to empower workers and scholars in reimagining plausible and preferable future *worker-robot relations* (WRRs). WRRs describe the interactions, collaborations, and shared practices between workers and robotic systems in organisational contexts. The workshop begins with an introduction to WRRs, and a keynote by a worldbuilding expert that will outline the method and its value for envisioning future WRRs. Groups of workshop participants will then investigate concrete case studies that demonstrate how robotic systems can support workers in their practice, with a focus on enhancing wellbeing. Through interactive activities in this workshop, participants will co-create imagined worlds of work, which will be analyzed systemically across multiple levels of complexity, from the individual worker and their immediate context to broader societal implications. The workshop ultimately aims to build a community committed to shaping sustainable futures of robot-assisted work.

CCS Concepts

• **Human-centered computing → Human computer interaction (HCI)**.

Keywords

worker-robot relations, worldbuilding, future of work, robots

1 Introduction

As robots are integrated into everyday workflows, the relationship between workers and robots, henceforth referred to as the **worker–robot relation (WRR)**, is emerging as a crucial site of inquiry. In labor-intensive fields, robotic systems are introduced to ease physical strain, address staffing shortages, and increase efficiency. Yet, their integration also reshapes the rhythms, responsibilities, and relational aspects of work. These transformations raise urgent questions about **worker wellbeing**, among the most critical: *what kinds of robotic future could support, rather than erode, the wellbeing and empowerment of workers?*

1.1 Worldbuilding for Generative Practices in Human-Robot Interactions

Worldbuilding is an **imaginative, critical, and participatory** method for exploring possible futures by asking expansive conjectural questions [3]. It helps us construct detailed, situated scenarios that reveal underlying assumptions, expose tensions, and open up alternative ways of thinking. As noted in [5], worldbuilding is not only about inventing fictional settings, but also about interrogating power, culture, and technology in order to imagine how things might be otherwise. Similarly, anthropological approaches to worldbuilding [7] highlight its capacity to situate possible futures within lived experience and social systems. In WRR settings, worldbuilding can become a valuable tool to align decision-makers' visions of technological innovation with workers' desires and expectations as robots enter the workplace, influencing and affecting work routines, roles, responsibilities, agency, and wellbeing. In this half-day workshop, we use worldbuilding to investigate the futures of robotics in professional work environments, with a focus on **worker wellbeing and empowerment**.

2 Workshop Theme

Drawing on previous work and workshops in the series, which explored technical, design, participatory, and methodological challenges for transdisciplinary research and innovation around WRRs [6]; as well as four types of complexities (system, participatory, process, and value frameworks) when working on WRRs [4]. For this edition, we propose a workshop that takes a more future-oriented perspective around these themes — creating a space to explore futures of worker–robot relations using *worldbuilding* as an imaginary, critical, and participatory medium [1]. Relying on such techniques allows us to decouple from immediate constraints and materialize configurations that present-oriented design struggles to capture. Participants will be able to co-imagine possible futures of robotic integration that center on the experiences of workers. We will leverage the Work-Robot-Relations (WRRs) framing [4, 6] to explore how emerging robotic systems can support workers' wellbeing. This framework considers the work practices (including the tasks performed, the tools used, etc.) and the organizational context in which these practices take place (including the physical settings, technical infrastructures, and people involved). It aims to shape more meaningful, just, and viable work futures, with and for workers.

3 Workshop Case Studies

We will offer three case studies grounded in current socially complex work environments: the experience of nurses in the hospital, that of construction workers in the built environment, and of baggage handlers in airports. These case studies invite reflection on current work practices, both technical and relational in nature. We will explore these cases across interconnected levels inspired by [3]. The first level (**S: Situated Scenario**) is that of the work floor. It involves the immediate interactions between workers and robotic systems, situated within real-world contexts. This includes embodied experiences, gestures, and technical work done in collaboration between a worker and a robot. The second level (**M: Work System Infrastructures**) focuses on the work system infrastructures,

investigating how robotic systems are integrated into workflows, spaces, and professional relations. This includes embedded systems, scenarios, and lived experiences as entangled across the human stakeholders (e.g., nurses, managers, facility staff, and technology developers), the work space, and technology. The third and final level (**L: Societal Futures**) is a societal one, considering the broader systemic transformations in labor that robotics may bring about. This includes a systemic vision of how the integration of robotics to support workers' wellbeing has impacted society, and how it has transformed shared values, rituals and practices around work. By building future worlds of work across these scales, participants are invited to imagine, critique, and reflect together. The aim is not to arrive at one definitive future, but speculate about a plurality of plausible futures that help us examine how robotics might reshape work in ways that prioritize human wellbeing [1, 3, 5].

4 Workshop Overview

This half-day workshop (see Table 1 for the program) builds on the previous workshops in the series. As organizers, we invite participants representing both academics and industrial practitioners who work within the areas of WRRs and HRI. Participants are encouraged to submit one-to-four page poster papers relating to any case studies of worker empowerment within their organizations — whether positive, negative, or speculative. The papers will be uploaded to the workshop website and presented within the workshop space to facilitate discussion between the respective authors and other participants.

Introduction and Keynote The workshop will start with a general introduction by the workshop organizers to build on the previous two workshops, followed by a keynote presentation by a leading figure in worldbuilding, Ann Pendleton-Jullian, who sets the scene for the ensuing hands-on activity, and delves into how various techniques can be used to speculate on WRRs, and allow for the worker to be empowered by how work is reconfigured (its technological, organizational, cultural, and societal contexts).

Worldbuilding Activity The next part of the workshop will be the hands-on worldbuilding activity, where participants will work in groups to develop their grounded, critical speculations about worker robot relations. Each group will focus on one of the three aforementioned case studies, supported by an assigned facilitator, as they work on large sheets of paper with coloured markers.

Group members will be encouraged to write out their thoughts as they scaffold within their domain across the different scale levels (i.e., **S**, **M**, **L**). For each domain and scaffolding scale, participants will think about worker empowerment through envisioning the WRR framework (linking the workers with technology and the organizational context). At the end of the scaffolding exercise, the participants will gather all their written material into a system map, which encapsulates the knowledge of that world across the different scales [2]. Each group will subsequently present their map to the rest of the workshop participants; after which closing remarks are shared by the organizers.

4.1 Workshop Participation

We will recruit participants through community mailing lists, social media, and the personal networks of the workshop organizers. All

Table 1: **Workshop Schedule**

Introduction
• Introduction to the workshop by the organisers *(10 min)*
Keynote
• Lightning Keynote *(25 min)*
• Discussion *(5 min)*
• Coffee break with participant poster presentations *(15 min)*
Activity with workshop participants
• Facilitated hands-on world-building activity *(75 min)*
• Coffee break *(10 min)*
• Facilitated hands-on world-building activity (continued) *(15 min)*
• Activity participants present their projects *(45 min)*
Wrap-Up and Next Steps
•Wrap-up, and closing remarks by the organizers *(10 min)*

the necessary resources, information, and updates will be made available on the dedicated workshop website.

Submissions by participants will follow a template provided on the workshop website, and will be peer-reviewed by the organizers and selected based on topic, relevance, and originality. At least one author of an accepted paper will be asked to attend the workshop in person.

4.2   Plan for Documenting the Workshop

Similar to the previous editions, the workshop website will serve as the main platform to document the activities and results. Material produced during the workshop will be published online, and made available open access. Results on how worldbuilding techniques within multidisciplinary groups can be used as effective tools to discuss and conceptualize HRIs that empower WRRs, will be considered for further dissemination in a potential special issue.

5   Workshop Organizers

Wilbert Tabone is a postdoctoral researcher in HRI at the Faculty of IDE, TU Delft, and at the Erasmus MC. His work explores the intersection of human-machine systems through the practical application of artificial intelligence, situated scenarios, and spatial computing. He is also active in science for policy and diplomacy, new media art, and digital heritage.

Benedetta Lusi is a postdoctoral interaction design researcher in a transdisciplinary project between Erasmus MC and TU Delft. She is currently researching how to support the care work of nurses in the hospital, and is interested in designing care technology for contradictory, sensitive, and highly diverse life experiences.

Alessandro Ianniello is an assistant professor in Design at Politecnico di Torino. His research explores the role speculative practices can play in shaping more desirable futures, where humans and technology coexist as agents.

J. Micah Prendergast is an assistant professor in HRI at TU Delft. His research interests include Bioaware robotics for rehabilitation and physical HRI in robotic-assisted work processes.

Deborah Forster is a cognitive scientist currently the transdisciplinary lead at FRAIM practicing transdisciplinary research & innovation.

Olger Siebinga is a postdoctoral researcher at the faculties of ME and IDE at TU Delft. His research focuses on non-verbal interaction between pedestrians and mobile robots for the future of work.

Maria Luce Lupetti is an assistant professor in Design at Politecnico di Torino. Her research is concerned with all matters of human entanglement with the artificial world, especially concerning complex technologies such as AI and robotics.

Eva Verhoef is the innovation lead at fieldlab RoboHouse on TU Delft campus, and co-leads FRAIM.

Dave Murray-Rust is associate professor in Human-Algorithm Interaction Design at TU Delft, exploring the spaces between people, algorithms and things, making and thinking towards better futures for humans and AI.

Marco C. Rozendaal is an associate professor of Interaction Design at TU Delft. His research explores HRI through a performative lens, with a focus on the experiential, relational, and situated aspects of interaction.

Ann Pendleton-Jullian is an architect, writer, and educator whose work bridges architecture, complexity science, and technology. She is a full professor and former director of the Knowlton School of Architecture at The Ohio State University.

David Abbink is a full professor in HRI at TU Delft. He leads FRAIM, the Dutch transdisciplinary research and innovation centre for shaping the future of physical work, with and for workers. For this he received the highest Dutch scientific distinction in 2024.

Acknowledgments

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