Robots for Care: Exploring Downstream Socio-ethical Effects and Upstream Interventions

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Abstract

This workshop explores the social, ethical, and practical implications of deploying robots for clinical or assistive contexts. Robots can expand access to disabled communities, such as by providing physical or cognitive assistance, and enabling new ways of participating in social activities. They can assist healthcare workers with ancillary tasks and care delivery, so they can work at the top of their license. However, the real-world deployment of robots across these contexts can create social, ethical, and organizational challenges, or *downstream effects*. Some challenges include potentially undermining the agency of disabled people and reinforcing their marginalization. In clinical settings, robots may disrupt care delivery, shift roles, and displace labor. To explore these issues, this workshop will invite trans-disciplinary speakers and participants from academia, industry, government, and non-academics with/without affiliations interested in surfacing their lived experiences in using or developing such robots. Through interactive group activities, this workshop intends to critically and creatively explore the future of robots for clinical and assistive contexts. Topics will include the downstream implications of robots in clinical or assistive contexts and potential upstream interventions. Outcomes of the workshop will include publishing key workshop artifacts on our website and initiating a follow-up journal special issue.

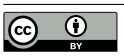
CCS Concepts

• **Human-centered computing**; • **Social and professional topics** → People with disabilities; Computing / technology policy;

Keywords

Assistive Robots, Ethics, Downstream Effects

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1 Introduction

Real-world deployments of robots in healthcare contexts have brought to light various complex issues [1, 9, 20]. For example, some hospital delivery robots originally intended to offload tedious clinician labor, instead generate new types of invisible work for clinicians. These include minding the robot (e.g., clearing pathways for the robot to navigate), coordinating their schedules around the robot's, and even offering the robot manual support to successfully complete the simplest of activities. These tasks are unpaid clinician labor akin to complex articulation work [31], and uncover a stark contrast between the expectations for, and the reality of deploying such robots. Further, the inclusion of such robots in formal healthcare contexts like hospitals inherently reconfigures power hierarchies [15], displaces and shifts labor [1, 27], and affects how care is provided and received [19, 34].

Similarly, assistive robots that aim to "fix" disability or provide unwanted assistance have been critiqued by disability centered researchers from fields including HRI, HCI, and crip technoscience for perpetuating systemic biases such as ableism [2, 4, 6, 8, 10, 13, 21, 29]. This is because many assistive technologies, including robots, are often designed based on oversimplified perspectives of the lived experiences of disability, shaped by dominant social narratives that frame disabled people as inherently dependent and in need of care [10, 13]. This can result in technologies that Liz Jackson, a disabled designer and activist, describes as a "disability dongle": a "*a well-intended, elegant, yet useless solution to a problem we never knew we had*" [18]. Such technologies risk undermining disabled people's agency [5, 24] and reinforce asymmetric power dynamics [10, 13].

Dominant social narratives surrounding disability can also lead key stakeholders, such as policy-makers, researchers, and developers, to make decisions often without sufficient inclusion or critical consideration of disabled people's perspectives when setting priorities or agendas. On a systemic level, this can lead to institutional or governmental policies which prioritize funding projects that are at odds with the needs and desires of disabled people and can lead to negative social, emotional, or economic impacts. For example, recent meta analyses show that despite the fact that treatment for autism (e.g., aligning to allistic social norms) is the second-to-lowest (#24/#25) topic in importance for autistic people, this is the #1 way robots are used on autism-related projects in HRI, eclipsing other applications by several orders of magnitude [10, 16, 28].

However, not all consequences of robots used in clinical and assistive applications are problematic. For instance, Moxi, a hospital delivery robot closely co-designed with nurses, has returned

time to nurses to work at the top of their license and focus more on patient care [7]. Similarly, many disabled people have formed communities around "crip hacking" and makerspace culture, where they creatively repurpose technologies to accommodate their own access needs [3, 11, 12, 14]. These examples demonstrate the nuance of leveraging robots in these contexts, highlighting their potential benefits when designed, developed, and deployed thoughtfully.

Thus, in this workshop, we aim to explore the "downstream" effects of robots used in clinical and assistive contexts. Downstream effects [23, 32] include the long-term social and ethical consequences that emerge after robots are deployed, often extending beyond the designer's or developer's intentions. Such effects include how robots may undermine the agency of disabled people, reinforce power asymmetries, disrupt care delivery, and displace labor. We will bring together speakers and panelists from a variety of backgrounds, including academia, industry, and government, to share their stories and experiences to help shape our understanding of what such downstream effects may look like.

In conjunction, we will ideate on "upstream" interventions to explore how we may mitigate negative downstream effects. Upstream interventions come from public health [33], and ideations therein involve early stage strategies that anticipate potential challenges, inequities, potential misuse, and other negative effects before deployment [26, 30]. Prior HRI work emphasizes the importance of engaging in participatory research practices and implementing policy strategies that proactively aim to mitigate downstream effects [17, 22, 25, 35]. Our conversations in this workshop will help identify proactive interventions that ensure robots complement, rather than complicate, human care practices.

This workshop will draw from the collective, multidisciplinary and lived experiences of speakers, panelists, and attendees to engage in critical dialogue, and ideate actionable recommendations and considerations for HRI researchers.

Relevance to HRI: This workshop is connected to the HRI community's ongoing efforts to understand and shape how humans and robots interact within real-world, complex social systems. Healthcare and assistive contexts are HRI domains where issues of trust, collaboration, safety, and ethics directly intersect with people's well-being. By examining how robots influence care practices, and ideating on strategies to design, deploy, and govern them responsibly, this workshop aims to lay the groundwork for future initiatives towards the downstream success of robots for clinical and assistive applications.

2 Organizing Committee

Sandhya Jayaraman is a final-year PhD student in Computer Science and Engineering at UC San Diego, whose research focuses on the design and development of clinically assistive robots for acute care.

Deep Saran Masanam is a 2nd-year PhD student in Computer Science and Engineering at UC San Diego, whose research focuses on understanding team interactions with robots.

Pratyusha Ghosh is a final-year PhD student in Computer Science and Engineering at UC San Diego, whose research explores the design and development of accessible telepresence robots to support people with chronic illnesses and disabilities.

Table 1: Proposed Workshop Schedule

09:00-09:15	Welcome and Introductions
09:15-10:05	Panel Discussion
10:05-11:00	Ideation Activity
11:00-11:30	Coffee Break + Poster Session
11:30-12:00	Keynote
12:00-12:20	Group Discussion
12:20-12:30	Closing Remarks

Alyssa Kubota is an Assistant Professor in the School of Engineering at San Francisco State University, whose research explores the design, development, and deployment of personalized assistive technologies.

Laurel Riek is the David R. Miller Professor of Computer Science and Emergency Medicine at UC San Diego, whose research interests include HRI, assistive technology, critical design, and health informatics.

3 Format

The workshop will include a keynote talk, panel discussion, poster session, and interactive group activities. We will organize themed discussion sessions around current key topics, including:

- Ethical, legal, and social implications of robots in clinical or assistive contexts
- Critical reflections on mis/alignments between design goals and impacts of robots on disabled communities.
- Upstream interventions at the meso or macro level (e.g., community programs, participatory research, policies)
- Community-based research practices
- Experience reports or deployment insights from key contexts, including:
  - Socially assistive robots
  - Cognitively assistive robots
  - Physically assistive robots
  - Hospital deployed robots (e.g., delivery, sanitation, surgery)
  - Rehabilitation robotics

The workshop has international speakers spanning academia, industry, and government. These include: Eduard Fosch-Villaronga, *Associate Professor, Leiden University*, Vy Nguyen, *OT Clinical Research Lead, Hello Robot Inc.*, Signe Redfield, *Researcher, Patient Led Research Collaborative*, Eva Heinold, *Researcher, German Federal Institute for Occupational Safety and Health*, Elizabeth Jochum, *Associate Professor, Aalborg University and Director of Robotics and Automation, RA Capital.*

Panelists will discuss their lived experiences as researchers, developers, or users of robots in clinical or assistive contexts, and interactively address questions posed by participants and organizers. Poster sessions will showcase accepted submissions, and offer opportunities for feedback and discussion with interdisciplinary researchers. The ideation activity and group discussions will center on thought experiments, drawing inspiration from speculative fiction and scenario-based activities, encouraging creative and critical exploration of key issues.

4 Audience and Dissemination

This workshop aims to bring together an interdisciplinary community of people interested in the social, ethical, and practical implications of robots for clinical and assistive contexts. By inviting a range of perspectives, from speakers and panelists, authors, and attendees, we aim to create a welcoming environment for students, postdocs, faculty, industry professionals, and community members to network and engage in critical dialogue on key workshop topics.

To ensure broad participation, we will share the call through robotics and healthcare mailing lists, and social media. We have created a website to support workshop material dissemination and publicity: https://healthrobotsworkshop.github.io/.

Our workshop will be in a hybrid format, supporting in-person and online participation. To facilitate engagement from remote attendees, a member of the organizing committee will monitor an online chat, and support participation in discussions and activities.

5 Submissions and Expected Outcomes

This workshop brings together short contributions on topics relevant to workshop themes. We hope to gather perspectives from transdisciplinary research communities and practitioners, and will encourage contributions from those outside the HRI community. We particularly encourage submissions that surface lived experiences, or cross-disciplinary insights that may be underrepresented in traditional academic venues. All accepted papers will be made available on the workshop website.

The workshop will synthesize insights on the downstream sociotechnical and ethical impacts of robots on key stakeholder communities in clinical and assistive contexts. Through discussion and activities, we will also identify upstream interventions, and explore how to incorporate them to address real-world challenges.

We plan to launch a special issue of a journal to help bring these workshop issues to bear, and to invite participants to contribute and expand on the ideas developed during the workshop.

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