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Robots for Communities

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Abstract

This workshop on *Robots for Communities* explores how robots can serve as shared social resources that support the collective well-being of communities. While robots have traditionally been created to serve corporations or individuals, leading human–robot interaction research to focus largely on individuals or small groups, communities remain a crucial yet underexplored context for robotics. Understanding robots in community settings requires an interdisciplinary lens that integrates robotics, design, the social sciences, humanities, and community practice. Rather than emphasizing the negative consequences of large-scale deployment, our focus is on the active, positive roles robots might play in shaping communities. Central to this vision is viewing robots not as personal possessions but as shared resources, with unique affordances that enable them to enrich community experiences in ways other technologies cannot. The workshop seeks to bridge technology-centered and community-centered perspectives to promote dialogue across disciplines. By bringing these perspectives together, we aim to establish an interdisciplinary agenda for the design, evaluation, and deployment of robots as positive forces for well-being and cohesion within communities.

CCS Concepts

• **Computer systems organization** → *Robotics*; • **Human-centered computing** → **HCI theory, concepts and models**.

Keywords

Community Robotics, Interaction Design, Group HRI, Robots for Society, Community Technology

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1 Introduction

Robots have traditionally been designed to serve corporations (e.g., by increasing productivity) or individuals (e.g., by providing entertainment, companionship, or workload reduction). This focus has naturally led to the dominance of one-on-one human–robot interaction research. Yet many aspects of human life are organized not around individuals but around communities – collectives of people who share resources, spaces, and practices, and who are connected by ongoing relationships, identities, or common goals. Communities may be geographically bounded (e.g., neighborhoods, towns), interest-based (e.g., hobby groups, activist networks), or institutional (e.g., schools, workplaces). Unlike the broader public, communities involve active interdependence and shared responsibilities, connected through shared aims, goals, and values. This makes them uniquely relevant contexts for exploring robots as social artifacts.

Understanding robots in community contexts requires an interdisciplinary lens that draws together robotics, design, the social sciences, humanities, and community practice. The Community Technology movement has shown how communities can design and build technologies aligned with their own values and needs [2, 5]. From local networks and citizen science projects to maker spaces and cooperative infrastructures, this movement provides an essential foundation for imagining robots for communities. Recent work in Human-Robot Interaction (HRI) has also highlighted the importance of considering the social characteristics of spaces in the design of robots, particularly the need to design systems that not only recognize and avoid disrupting but also actively support and participate in community life [11].

In recent years, robotics researchers have begun to investigate how robots contribute to group interactions, showing that robots can shape relationships between people both explicitly and implicitly [3, 13]. Others have proposed first concepts on how robots impact larger, less defined user groups such as communities [6–8, 14] or society as a whole [4, 12]. This recent body of work highlights a new frontier - developing robots as shared resources for groups, with the potential to influence their well-being and cohesion.

The emerging field of Community Robotics sits at the intersection of these trajectories, building on both robotics research and the longstanding practice of community technology. However, we have, so far, only seen a few approaches at explicitly designing robots for communities [9, 10, 15]. In addition, today's innovation ecosystem is poorly equipped to support this vision. Dominant funding models, market logic, and governance structures typically privilege

scalable corporate or consumer applications, leaving little space for community-driven approaches. To enable *Robots for Communities*, we must rethink not only how we design robots, but also how we organize and support innovation itself [1].

This workshop aims to explore how robots can be designed and studied as positive forces for communities and society. Importantly, the emphasis is not on the (negative) consequences of large-scale robot deployment, but on the active, constructive roles robots might play in shaping collective experiences. We will consider robots as shared social resources rather than personal possessions and emphasize the unique affordances (or superpowers) offered by robots that enable them to impact communities in ways other technologies cannot. The central questions motivating this workshop are:

- What kinds of collective needs or goals can robots uniquely address within communities?
- What do communities stand to gain from shared community robots?
- How should we evaluate, govern, and sustain community-oriented robotic systems?
- Which computational and interaction-design challenges does this setup introduce?

By addressing these, the workshop will set an agenda for advancing research on robots for communities, and establish bridges between robotics, design, and social sciences.

2 Topics of interest

We welcome contributions and discussions on (but not limited to):

- Lessons from adjacent fields, drawing on design, urban studies, civic technology, and community informatics to inform community-scale HRI.
- Frameworks and methods that guide the study and design of robots for communities.
- Metrics for communities capturing collective behavior, social processes, and shared needs.
- Evaluation at scale through approaches that assess long-term performance and impact beyond individuals or small groups.
- Roles of community robots, ranging from social roles (enabler, facilitator, community organizer, social worker) to non-social roles (repetitive and mundane tasks such as cleaning or logistics in community spaces).
- Community and societal impact, considering cultural, social, economic, and environmental implications.
- Equity, diversity, and inclusion, ensuring fair access, avoiding inequities, and supporting underrepresented groups.
- Governance and participation, including models for ownership, stewardship (long-term care and responsibility), and participatory decision-making, particularly in polarized and contested settings.
- Life cycle of community robots, including deployment, maintenance, obsolescence, and long-term sustainability of robots embedded in communal contexts.
- Technical and ethical challenges, including privacy, data governance, safety, robustness, and resource constraints in real-world community environments.
- Applications and case studies, such as robots in libraries, schools, community centers, healthcare facilities, etc., emphasizing proactive community building and social value.
- Transition from personal to communal robots, highlighting shifting needs, values, and challenges as robots move from individual to collective settings.

3 Approach

The workshop combines interdisciplinary expert presentations with interactive sessions to explore approaches, solutions, and challenges in community-centered HRI. It will begin with an invited talk by Prof. Selma Šabanović on *robots and interaction design in community contexts*, followed by spotlight presentations from contributing authors. Participants will bring posters on their work and join small groups (4–5 people) to discuss selected posters in relation to the community-centered research questions motivating this workshop (see Introduction). Each group will summarize their insights and volunteers will present key takeaways before a coffee break.

The second half of the workshop will center on community technology practice, beginning with a talk by Dr. Matt Dowse on *Community Technology as a Process*. This will be used as an introduction and provocation for a second interactive session, where participants will work in small groups with fictional community scenarios to co-design a robot for a community, prepare a project engagement plan that informs the robot's design, and provides intrinsic benefits to the community. Participants will also be encouraged to reflect on how their process would navigate issues of ongoing consent and account for the "unknown-unknowns" inherent in situated, community-based practice. The workshop will conclude with a closing talk by Dr. Stuart Reeves on *Public Robots and New Orders of Public Interaction.*

3.1 Call for Contributions

We invite participants to submit a 2-3 page extended abstract. The first 1-2 pages should describe ongoing or recent work relevant to the workshop's topics of interest, and the final page should reflect on its connection to the workshop's guiding research questions defined in the introduction, highlighting key experiences, challenges, or insights. Submissions will be reviewed by the workshop organizing committee for their fit and adherence to scientific standards.

3.2 Schedule

- Welcome Message (5min)
- Invited Presentation Selma Šabanović - e.g. "Designing Robot-Community Interactions" (30min)
- Spotlights on Submitted Papers (15min)
- Interactive session - Poster discussion groups on follow-ups of the submission insights (30min)
- Sharing of key results (15min)
- Coffee break (15-20min)
- Invited Presentation Matt Dowse - "Community Technology as a Process" (30min)
- Interactive Session: The process of co-designing Robots for Communities (45min)
- Invited Presentation Stuart Reeves - e.g. "Public Robots and New Orders of Public Interaction" (30 mins)

- Sharing of key results and Farewell Message (20min)

3.3 Invited Speakers

Selma Šabanović is a Professor of Informatics and Cognitive Science at Indiana University, Bloomington, USA. Her research examines the design, use, and societal consequences of socially interactive and assistive robots across diverse cultural and social contexts, bringing critical perspectives from science and technology studies into human-robot interaction and social robot design.

Matt Dowse is a Senior Research Associate at the University of Bristol Business School, UK, working within the Centre for Sociodigital Futures. His research critically examines and re-imagines organizing in complex social contexts, with a focus on alternative organizational models, inter-organizational relations, and co-production, employing provocative research methods to challenge conventional thinking. Matt also curates the UK Community Technology Network and stewards its Community of Practice.

Stuart Reeves is a is a Professor at the School of Computer Science at University of Nottingham. He researches ways to hybridise HCI with studies of social organisation (ethnomethodology, conversation analysis), often employing video-based and ethnographic approaches. Recently he has been applying this to problems in HRI and Human-Robot Collaboration. Stuart recently completed a Responsible AI UK funded International Partnerships Project "Understanding Robot Autonomy in Public".

4 Solicitation/Dissemination

We invite participation from researchers interested in group HRI, human–human–robot interaction, community-centered design, community technology, roboethics, and related topics. The workshop aims to attract around 20–30 participants, including both authors and attendees without submissions, given the broad relevance of this topic. A call for 2-3 page extended abstracts will be published on the workshop website and shared via relevant mailing lists such as robotics-worldwide, HRI, and CHI-announcements, as well as through organizers' and speakers' networks.

Accepted contributions will be posted on the workshop website (https://sites.google.com/view/robots-for-communities/home). Insights from the interactive sessions will be synthesized by the organizers to be published as a blog post, that will be shared via the University of Bristol Centre for Sociodigital Futures Community Technology Network mailing list.

4.1 Organizers

Hifza Javed is a Senior Scientist at the Honda Research Institute USA and a human–robot interaction researcher. Her recent work examines robotic traits that shape group dynamics and the potential roles of intelligent agents in supporting collaboration within teams. She is particularly interested in advancing socially intelligent technologies that facilitate communication and collaboration, and improve learning outcomes in culturally diverse groups.

Ella Maule is an interdisciplinary PhD researcher at the Bristol Robotics Laboratory. Her research interests are at the intersection of technology, design, and society. She explores how to center communities as stakeholders in technology innovation to create more ethical, equitable, and sustainable robotic systems, and develops interdisciplinary design frameworks for "Community Robotics".

Thomas H. Weisswange is a Principal Scientist at the Honda Research Institute Europe. He has an interdisciplinary background covering bioinformatics, computational neuroscience, intelligent transportation, machine learning, technology ethics, and human-robot interaction. His current research interests include robot interactions with groups, human-robot cooperation, theory-of-mind, and intelligent systems design.

Bilge Mutlu is a designer, human-robot interaction researcher, and a professor of computer science at the University of Wisconsin–Madison. He is an "HRI generalist" interested in design principles and systems for and societal implications of robotic technologies.

References

[1] Rachel Coldicutt and Matt Dowse. 2024. What good is innovation if it doesn't work for everyone? https://www.promisingtrouble.net/blog/innovation-for-everyone

[2] Anna Dent and Rachel Coldicutt. 2022. *The Case for Community Tech.* Report. Promising Trouble;.

[3] Sarah Gillet, Marynel Vázquez, Sean Andrist, Iolanda Leite, and Sarah Sebo. 2024. Interaction-Shaping Robotics: Robots That Influence Interactions between Other Agents. *ACM Transactions on Human-Robot Interaction* 13 (2024), 1–23. Issue 1. doi:10.1145/3643803

[4] Randy Gomez, Eleanor Sandry, Selma Šabanović, Deborah Szapiro, Daniel Serrano, Thomas H Weisswange, Matthew Aylett, Guangliang Li, Eric Nichols, and Luis Merino. 2024. Three Principles for Social Robots as Embodied Mediators. In *16th International Conference on Social Robotics +AI (ICSR 2024).* doi:10.1007/978-981-96-3525-2_7

[5] Karl Hess. 1979. *Community Technology.* Harper & Row.

[6] Swapna Joshi. 2019. Robots for communities - A value framework. In *ACM Conference on Computer Supported Cooperative Work (CSCW 2019): Companion.* ACM, 64–67. doi:10.1145/3311957.3361860

[7] Swapna Joshi and Selma Šabanović. 2017. A communal perspective on shared robots as social catalysts. In *26th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 2017).* IEEE, 732–738. doi:10.1109/ROMAN.2017.8172384

[8] Ella Maule, Hemma Philamore, Matthew Studley, Helen Manchester, and Mark Goudswaard. 2024. Community Robotics: A New Paradigm for Robotic Design and Innovation. In *IEEE International Conference on Advanced Robotics and Its Social Impacts (ARSO 2024).* IEEE Computer Society, 153–160. doi:10.1109/ARSO60199.2024.10557833

[9] Sanika Moharana, Alejandro E. Panduro, Hee Rin Lee, and Laurel D. Riek. 2019. Robots for Joy, Robots for Sorrow: Community Based Robot Design for Dementia Caregivers. In *14th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2019),* Vol. 2019-March. IEEE Computer Society, 458–467. doi:10.1109/HRI.2019.8673206

[10] Isabel Neto, Hugo Nicolau, and Ana Paiva. 2021. Community based robot design for classrooms with mixed visual abilities children. In *ACM Conference on Human Factors in Computing Systems (CHI 2021).* 31. Issue 31. doi:10.1145/3411764.3445135

[11] Hannah RM Pelikan, Bilge Mutlu, and Stuart Reeves. 2025. Making Sense of Public Space for Robot Design. In *20th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2025).* IEEE, 152–162. doi:10.1109/HRI61500.2025.10973847

[12] Selma Šabanović. 2010. Robots in society, society in robots: Mutual shaping of society and technology as a framework for social robot design. *International Journal of Social Robotics* 2 (2010), 439–450. Issue 4. doi:10.1007/S12369-010-0066-7

[13] Thomas H. Weisswange, Hifza Javed, Manuel Dietrich, Malte F. Jung, and Nawid Jamali. 2025. Design Implications for Robots that Facilitate Groups–A Scoping Review on Improving Group Interactions through Directed Robot Action. *ACM Transactions on Human-Robot Interaction* (2025). doi:10.1145/3777455

[14] Willow Wong and Mark James Findlay. 2021. Robots in Community. *SMU Centre for AI & Data Governance* 11 (9 2021). doi:10.2139/SSRN.3929295

[15] Yangmengfei Xu, Suxuan Tian, Guojing Wang, and Bin Tang. 2025. From Isolation to Connection: Community Service Robots for Social Cohesion and Sustainability. In *20th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2025): Student Design Competition.* IEEE Computer Society, 1953–1956. doi:10.1109/HRI61500.2025.10973824

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