

Table 16 HRI Equitable Design

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Topic	Original and Expanded Design Justice Questions	HRI Equitable Design Questions
1. Equity	Who gets to design?	<p>Who gets to be included in robot design process? How can we incorporate people and communities into the design processes through participatory techniques such as participatory design and co-design?</p> <p>What is the background and identity (race, class, ethnicity, gender, disability, sexuality, etc.) of those who are included in the process?</p>
2. Beneficiaries	Who do we design for, or with?	<p>Who is the target users for the robot application?</p> <p>What are the target users' identities and backgrounds?</p> <p>Do people's backgrounds or identities impact who is included as a target user and how the device is designed?</p> <p>Who is not included as a target user?</p> <p>Whose device desires and preferences are included in the design of the robot?</p> <p>How do researchers explore and understand the spectrum of users' wants and needs including personalization, adaptability, and flexibility? How are these reflected in the robot design?</p>
3. Values	What values do we encode and reproduce in the objects and systems that we design?	<p>Whose values are prioritized in the design of the robot and/or robot application?</p> <p>What values, biases, and assumptions are roboticists and designers embedding into robots?</p> <p>What practices can researchers incorporate to mitigate the encoding and reproduction of inequitable values in robots and promote the inclusion of equitable and antiracist values?</p>

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4. Scope	How do we scope and frame design problems?	What problem or need informs the design of the HRI study or technology? What are the key elements of my study? (i.e. lab based study, in the wild study, deployed robot, etc.) What is the time span of our study? Is it short-term or long-term? How will my study questions evolve over time?
5. Sites	Where do we do design, what design sites are privileged and what sites are ignored or marginalized, and how do we make design sites accessible to those who will be most impacted?	What context do we design robots for? Where are the robots designed? Are they designed in the lab or in the context they will be deployed? How could we include more design sites? What ways can we transform where we design to make the design sites more accessible for those who will be most impacted?
6. Ownership, Accountability, and Political Economy	Who owns and profits from design outcomes, what social relationships are reproduced by design, and how do we move towards community control of design processes?	Who controls or directs the design process and/or robot system? Who will benefit by the introduction and design of the robot? How can communities and people impacted by the technology have greater control in the robot design process? What social relationships are in the current context? How will the robot support, change, or undermine current social relationships?
7. Discourse	What stories do we tell about how technologies are designed?	How do people describe or discuss the robot? What stories do people share about the robot and its impact on them? How do stories of the technology differ across people from varied backgrounds or identities that engage with the robot?

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8. Entry and Exit	How should roboticists mindfully design the entry and exit of the robot?	How should researchers structure entry and exit being mindful of the relationship and perhaps dependency that users may develop with the robot? What does a mindful exit procedure look like? How can users be continued to be supported after robot studies?
9. Autonomy	Who has control over the robot system?	How much control should users, roboticists, or other stakeholders have over the robot? Who owns the robot? How do robot designs promote or demote user ownership of the system? How can users maintain a feeling of control over the robot system?
10 Transparency	How does the robot communicate function and intent to the user?	How do roboticists support user understanding of the system and its intention? Who benefits from a lack of transparency in robot system design? Who is harmed by a lack of transparency?
11 Deception	What design features deceive users?	What goals do companies achieve by leveraging methods of deception such as branding and false advertising? Who would be most harmed by the robot's deception? Who gains the most by the robot's deception?
12 Futures	What are the potential forthcoming social and ethical implications of the robot in use contexts?	What are the potential limitations of the robot use contexts? What are the potential positive and negative implications of the system? Who is most likely to be impacted by the robot system

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12 Policies	How do we consider policy in the design of social robots?	What policies at the local, state, or federal level may be necessary to support users of robot technologies? What policies at the local, state, or federal level may be necessary to protect users of this technology? What policies may representatives and lobbyists in government try to pass that could positively or negatively impact users?

Ostrowski, A. K., Walker, R., Das, M., Yang, M., Breazea, C., Park, H. W., & Verma, A. (2022). Ethics, Equity, & Justice in Human-Robot Interaction