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Accomplishing Robotic Autonomy: The Complexities of Sociotechnical Care and Agency in the Laboratory

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Abstract

Effective ethical interventions in emerging technologies such as robotic autonomy demand situated understandings of the practices that shape them. Drawing upon a year of participatory ethnography, this study examines the sociomaterial practices used to accomplish robotic agency in an engineering research laboratory. Ironically, the robot was often a helpless, even pathetic, figure. Roboticists displayed an attitude of surprisingly genuine, diligent, and self-effacing care toward the robot as they helped enable it to perform basic competencies such as picking up a bottle. Using a practice theory, we show how roboticists' care practices, motivated and sustained by anticipatory narratives of robotic agency, accomplish robotic autonomy. We argue that interventions must acknowledge and engage with the complex dynamics of technologists' care to be effective.

Keywords: agency, anticipatory narratives, care practices, practice theory, robotics development

Introduction

The increasing integration of advanced artificial intelligence (AI) into embodied agents such as autonomous robots pervasively impact research, development, and deployment of commercial technology, and, increasingly, daily experience. While advanced technologies have brought numerous changes that have resulted in more convenience and efficiency to daily life, concerns surrounding the use and implications of these technologies are proliferating. These include the in/visibility of labor (Suchman, 2007), machine ethics (Gunkel, 2022), negotiation of human agency and machine control (Gibbs et al., 2021; Kirkwood et al., 2022). Keeping pace with these developments demands ever-more situated and participatory engagement with emerging technologies and their impacts.

There is a growing body of literature which centers on the potentials and problems surrounding the development and use of robotics technology. The effects of robots in workplaces have been consistently examined (Barrett et al., 2012; Beane & Orlikowski, 2015; Sergeeva et al., 2020). Actual or potential harms have been traced to roboticists' normativity (Brandão, 2021), unexamined assumptions about users (Cheon & Su, 2017), or values that recapitulate harmful social dynamics (Benjamin, 2019; Castañeda & Suchman, 2014). In response to these findings, many studies have urged the adoption of specific design frameworks or theoretical perspectives (Johnson, 2023; Wagman & Parks, 2021). These laudable interventions have had uneven success and much of technical robotic research seems to continue to see its work as minimally connected to ethical or societal concerns.

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