

Constructing Robotic Agency

Communicative Practices in Robotics Development

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Introduction

In response to the growing ethical concerns surrounding the impact of emerging technology in our society, such as artificial intelligence and robotics technology, many studies have urged the adoption of design frameworks or theoretical perspectives to curb negative technology outcomes [1-2]. However, these ethical interventions have had uneven success.

Keeping pace with emerging technology development and understanding its potential societal harms demand ever-more participatory engagement with emerging technology designers' practices that shape technology.

Research Goal

This study inquires how roboticists and robots interact that comprises development practices, how these social practices construct robotic agency and shape robotics products.

By understanding these practices that are critical to influencing the powerful autonomous technology they produce, we can address any harms that come from these practices and intervene in development.

Methods

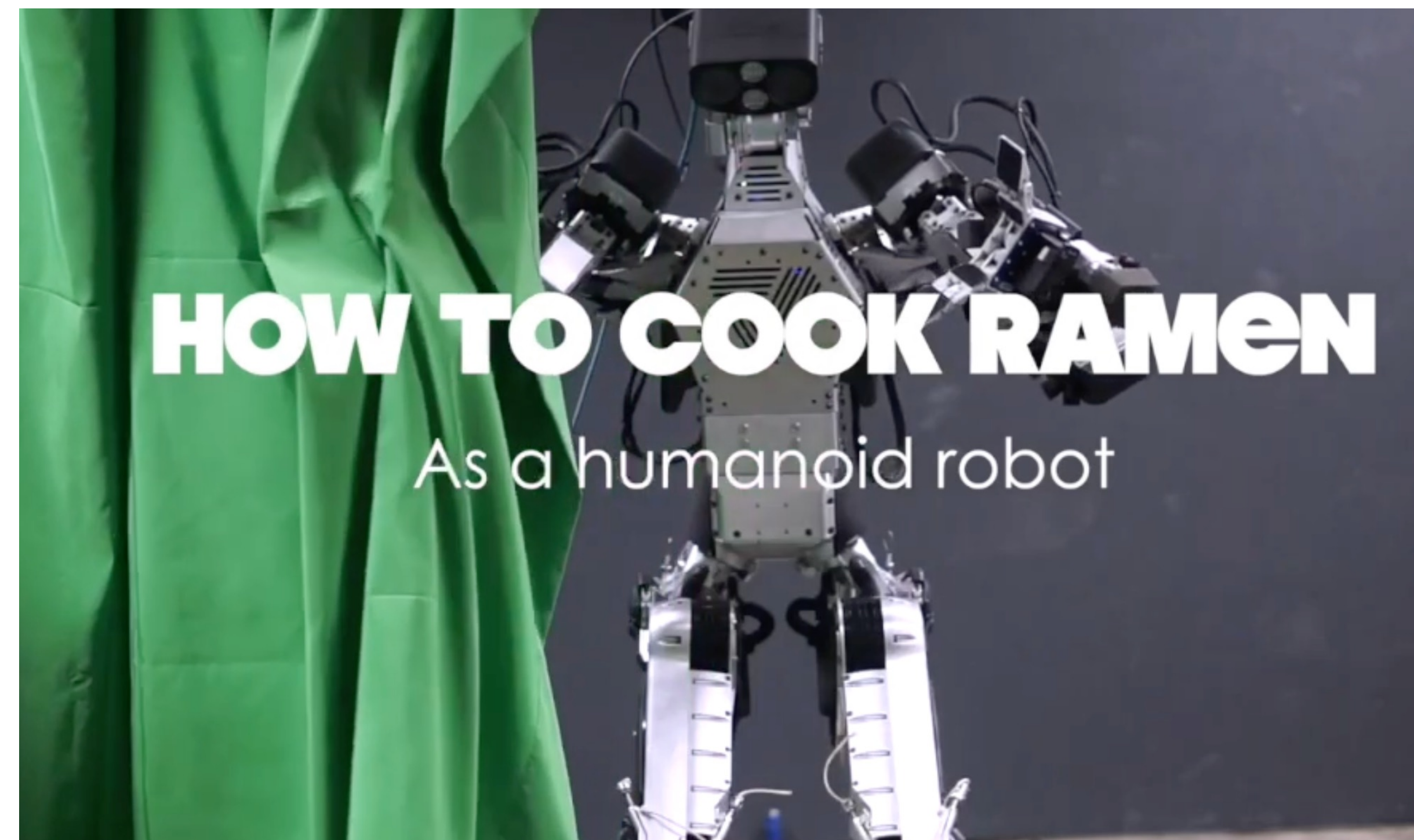
Ethnographic Study

- Embedded in a technical robotics research laboratory (1 year)
- Followed 2 robotics projects primarily
- Conducted 60+ field visits, 2-5 h each
- Interviewed key participants

Theory & Framework

- Grounded theory [3] – an abductive approach
- Practice theory [4] – focuses on the everyday activities that participants engage and the recursive interactions between participants and robots.
- Relational, performative enactment of agency and meanings [5-6]

Figures and Findings



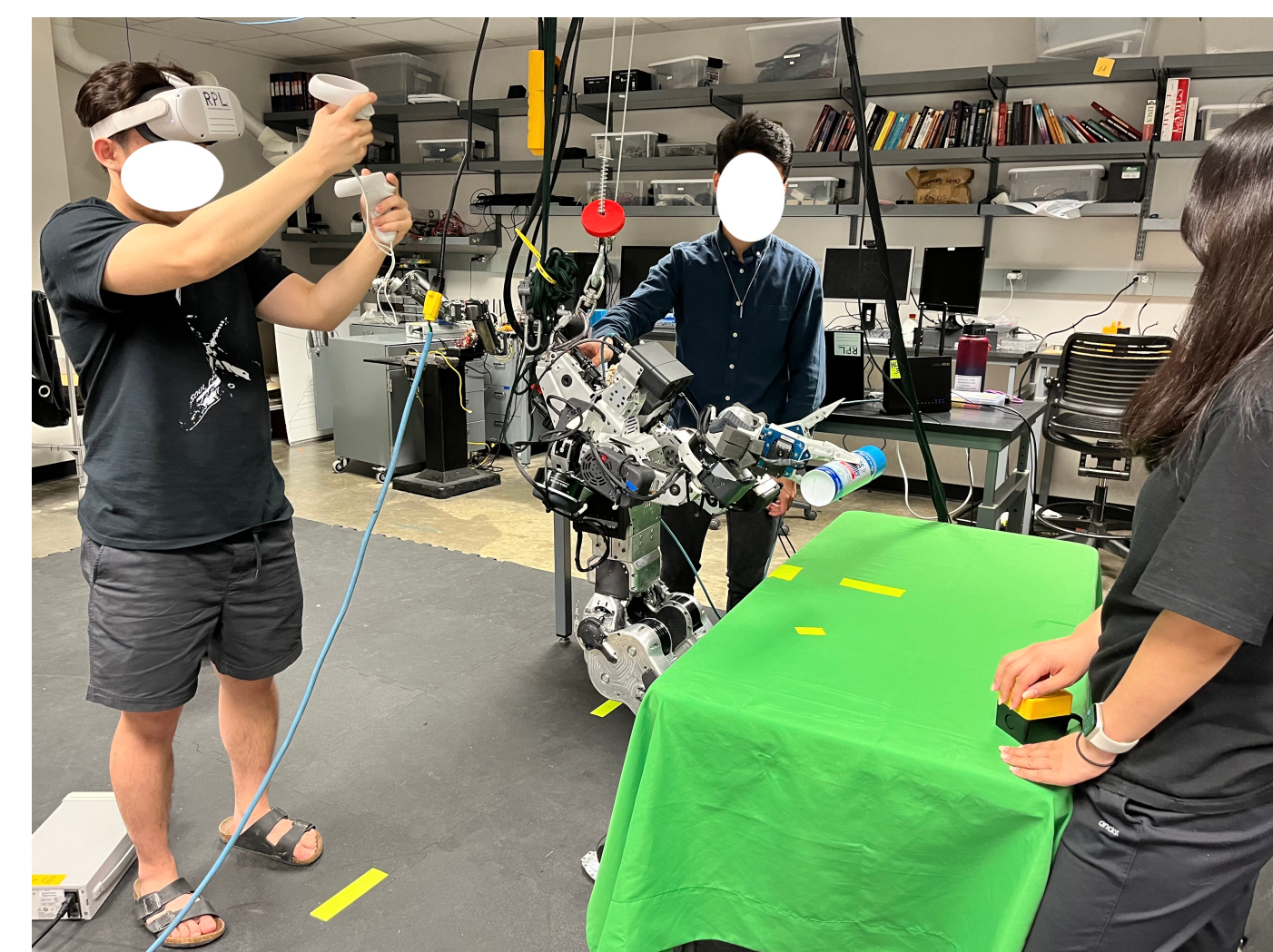
Robot Teleoperation Demo

Practices of Caring for Robots

- Protecting and Enabling the Robot
Providing physical support and reminding each other, anticipating issues and needs, repairing and tinkering frequently, accommodating robots' ability
- Being Emotionally Influenced by the Robot
Frustrated and troubled by the robots, feeling of uncertainty and a lack of agency
- Knowing and Maintaining the Belief
Constructing narratives of robots benefiting humans, celebrating robots' achievements

Implications of Care Practices

- Achieving robotic autonomy and pushing through the mundane labor
- Constructing robotic agency and creating power asymmetry – Powerful robot, invisible human, undervalued care



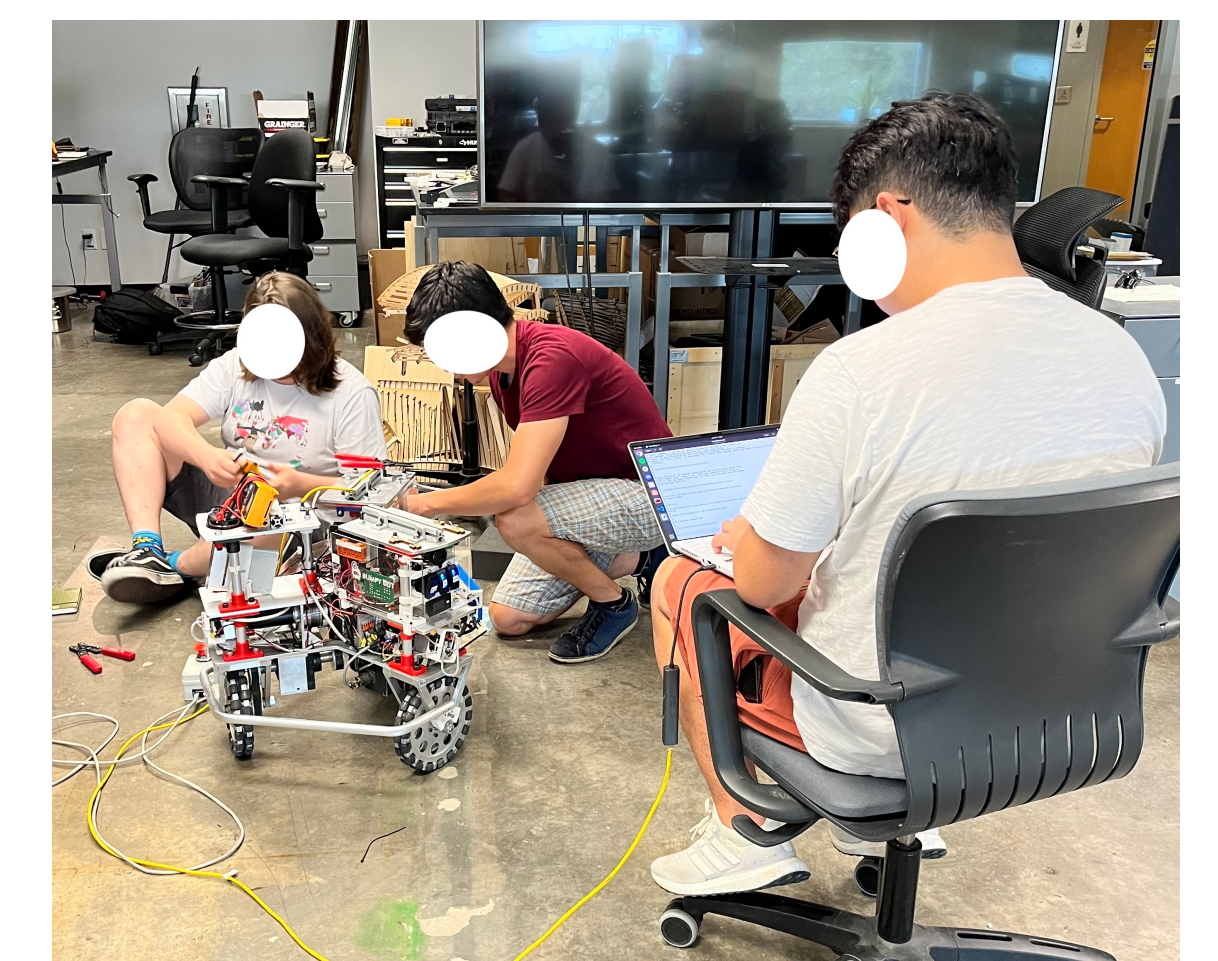
Robot Teleoperation Experiment



Robot in "Surgery"

Conclusion

The configuration of the robotic autonomy research laboratory is a site of genuine and prosocial practices of care. However, care practices construct robotic agency by rendering invisible the constitutive human labor that goes into maintaining it. This exacerbates power asymmetry between the seemingly powerful technology and the invisible human labor that is essential to achieving robotic capability and shaping societal impacts of the very technology under development.



Group Troubleshoot

Acknowledgments

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