Identifying Accessibility Barriers to Robotics Research



Authors

Brian Martinez Michele Lee Kevin Rowland

Larisa YC Loke Andrew Thompson Mahdieh Nejati Javaremi Brenna Argall

Institute

Northwestern University Shirley Ryan AbilityLab Chicago IL, USA

Northwestern

Shirley Ryan Solity Lab.

Knowledge barriers often arise due

to limited awareness of research

established research institutions

what robotics research entails also

A lack of understanding about

contributes to these barriers

awareness and understanding

engagements may unintentionally

obscure understanding of robotics

research due to limited technical

inadvertently distance end-users

from academic discourse and

obscure the research process

Individual background and

interests greatly influence

Such strategies, aimed at

preventing participant bias,

Researcher-end user

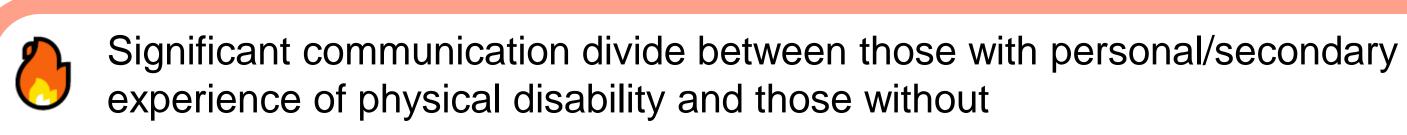
explanations

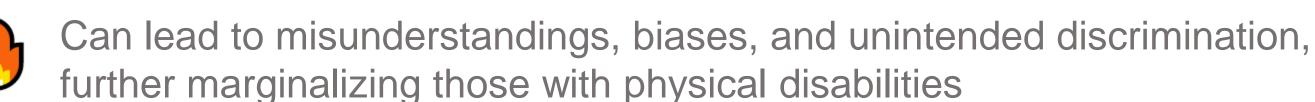
opportunities, especially for

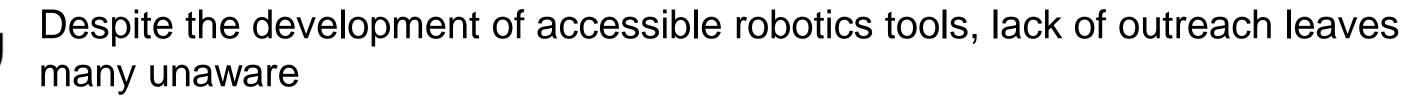
individuals without ties to

Motivation

We spotlight the under-representation of individuals with physical motor impairments in the robotics field, as we tackle barriers which hinder participation and propose solutions to foster inclusion and empowerment in our research community.

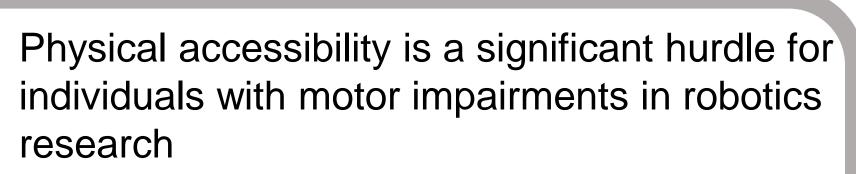






Participation of individuals with disabilities in research attests to their capabilities but often gets overshadowed by communication gaps

It is incumbent on the academic research community to address these issues, reducing individual obstacles and feelings of insecurity



Barriers include hands-on tasks for robotics interaction, limited accessible research facilities, and demanding travel requirements

Widely used robotics tools often lack accessibility-centric designs and require precise dexterity

Inconsistencies between systemic and institutional policy implementations perpetuate accessibility barriers, despite guidelines such as the U.S. Fair Housing Act



Communication

Barriers

Robotics

Research

Advocacy groups can help bridge communication gaps by promoting awareness about the abilities of individuals with disabilities within the robotics community, and conveying advancements in robotics to those with motor impairments

Highlighting the connection between individuals' disabilities and the research is essential for full involvement

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Knowledge

Barriers



Researchers should prioritize disseminating findings to both the public and academic circles

Informative newsletters and regular follow-ups can deepen the connection of individuals with disabilities to the scientific community

Extending outreach to K-12 education and using non-academic platforms like social media can raise awareness about potential research involvement among people with



Technology Barriers

Despite improvements in assistive technologies, more innovative tools are needed to actively engage individuals with disabilities in assistive robotics research.

These tools should aim to empower individuals beyond solely enhancing their quality of life.

Presently, accessible software and tools often lack complete functionality compared to their less accessible counterparts.

Examples include some Command Line Interfaces (CLIs) versus Graphical User Interfaces (GUIs).

This limitation restricts individuals reliant on accessible versions from fully utilizing these resources.

Robotics kits should be straightforward to assemble, using snap-on, click-in, or

disabilities

pressure-fit fittings, cables, and connections. Use of mixed reality is inevitable but needs to be nurtured with

accessibility as one of its core principles (not an afterthought)

These kits should be programmable via commonly available devices, like smartphones or tablets, to promote intuitive engagement and increased accessibility.

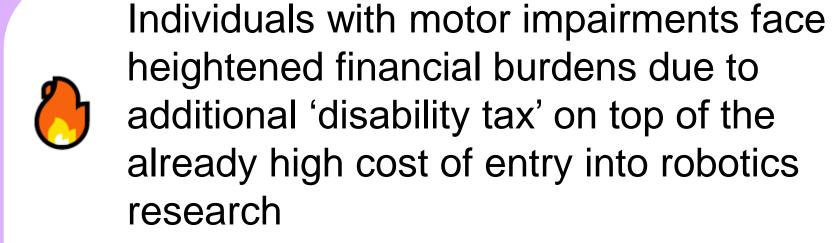
Kits should be modular, allowing users to work on different projects by reassembling the blocks, such as motors, in various configurations.



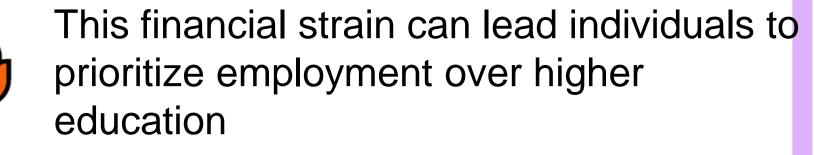
Physical Barriers

Upholding the Seven Principles of Universal Design can broaden access to robotics

Physical barriers can be alleviated with personal resources or support networks, and the use of assistive technologies like alternative interfacing systems and robotic assistance



Additional expenses can include private transportation, prepared food, and extra healthcare and accessibility devices



This situation perpetuates a cycle limiting access to STEM careers for individuals with motor impairments

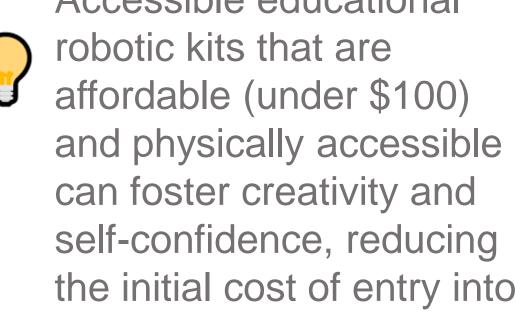
The existing system therefore amplifies economic disparities for those with physical disabilities



The cost barrier can be mitigated through opensource and shared resources like communityfunded maker spaces.

Accessible educational robotic kits that are affordable (under \$100) and physically accessible can foster creativity and self-confidence, reducing the initial cost of entry into robotics research for people with physical motor impairments.





Don't need to know or be able to do all aspects of robotics to be a robotics researcher (none of us do!)

Need to focus on each individual's abilities and foster their interests and strengths Accessibility needs to be at the core, not an afterthought

Robotics research becomes inclusive through virtual interaction, design and simulation



