



BrushLens: Hardware Interaction Proxies for Accessible Touchscreen Interfaces Actuation

TECHNOLOGY NUMBER: 2023-488



OVERVIEW

BrushLens is a hardware-enabled phone case and proxy system that allows users with diverse abilities to make physical interactions on inaccessible touchscreens using the accessible interfaces on their personal devices.

- Instantly translates user intent from accessible interfaces to precise touch actions on public kiosks and appliances, reducing error and user effort.
- Largest market opportunities: retrofitting inaccessible kiosks, appliances, and interfaces in retail, travel, restaurants, and healthcare—where accessibility retrofits are costly or impractical.

BACKGROUND

Touchscreens have become the primary interface for public devices—like ordering kiosks, ticket machines, and home appliances. Despite their ubiquity, most assume visual, cognitive, and motor abilities that many users do not possess. Blind and low-vision users often cannot perceive or navigate graphical layouts; people with motor impairments struggle with the gestures and precision required for touch events. Existing accessibility solutions either require fundamental hardware/software modification (not realistic for legacy devices), or still rely on the user to execute precise gestures, leaving high risk of mistouches and frustration.

Global regulatory trends and increased public awareness around digital accessibility necessitate affordable, scalable retrofits for billions of deployed devices. Upgrades are often cost-prohibitive, yet venues face legal and reputational pressure to eliminate exclusion. BrushLens

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Category

Hardware

Software

Software & Content

Accessible Technologies/Blind

Accessibility

Accessible Technologies/Motor

Accessibility

Inventor

Anhong Guo

Further information

Ashwathi Iyer

ashwathi@umich.edu

[View online](#)



addresses a growing need for accessible, risk-free interaction on devices that cannot be easily replaced or overhauled, with broad market potential across industries facing accessibility mandates.

INNOVATION

BrushLens consists of a portable phone case equipped with multiple actuators (electromechanical touch generators), a standard smartphone running accessible software, and an intelligent processing unit. The system “sees” and understands the target device using cameras and sensors on the user’s phone, interprets the interface, and translates user intention—e.g. button press, menu selection—via the phone’s accessible interface (screen reader, switch, or assistive touch commands).

After the user selects an action, BrushLens automatically locates its position and precisely triggers a physical touch at the corresponding location on the underlying touchscreen, using actuators that mimic taps or clicks. Users no longer need to aim for small buttons, learn new device behaviors, or risk accidental activation. Unlike prior solutions, BrushLens does **not** require any hardware/software changes to the kiosk or device itself; it works with existing legacy infrastructure. The system supports modular actuator design, allowing compatibility with capacitive and resistive touchscreens, as well as physical keypads and buttons. This major advance enables people to use their familiar assistive technologies (like VoiceOver, TalkBack, or adaptive switches) to control devices previously inaccessible to them, while also reducing error rates and interaction fatigue.

BrushLens therefore creates a portable, universal “bridge” for accessible device control—empowering users, lowering compliance cost for venues, and introducing risk-free interaction capabilities that enable access for all.

ADDITIONAL INFORMATION

REFERENCES:

["BrushLens: Hardware Interaction Proxies for Accessible Touchscreen Interface Actuation"](#)

INTELLECTUAL PROPERTY:

Patent application pending