Haptic Smart Phone-Cover: A Real-Time Navigation System for Individuals with Visual Impairment

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ABSTRACT

Researchers at the University of California, Davis have developed a haptic interface designed to aid visually impaired individuals in navigating their environment using their portable electronic devices.

FULL DESCRIPTION

This technology is compatible with smartphones, utilizing various onboard sensors for real-time obstacle detection. The surface topography of the interface dynamically morphs to reflect the location and size of surrounding or nearby obstacles, aiding visually impaired individuals to navigate both in indoor and outdoor environments. This tactile or haptic interface is used as an accessory to a smart device, with or without a conventional tool such as a white cane.

APPLICATIONS

- Assistive technology market for visually impaired individuals
- Smartphone accessory market

FEATURES/BENEFITS

- No need for carriage of additional devices, thanks to compatibility with smartphones
- Ability to activate or deactivate haptic navigation system on demand
- Utilizes existing familiarity with fingertip tactile stimulation arising from Braille use
- Can represent both receding and protruding obstacles
- Utilizes comprehensive sensory suite onboard smartphones for enhanced reliability
- Potential for small footprint and low manufacturing cost with PCB-based actuator array and 3D printable mechanical flexures
- Independent and efficient navigation for visually impaired individuals
- Reduces reliance on traditional navigation tools like white canes and service dogs
- Addresses limitations of previous attempts at tech-based navigation assistance, such as obtrusiveness and overburdening of senses

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

3D printable components, assistive technology, braille-inspired interface, dynamic tactile feedback, haptic smartphone cover, pcb-based actuator array, real-time obstacle detection, smartphone accessory, navigation aid for visually impaired

CATEGORIZED AS

- **Engineering**
  - Engineering
  - Other
  - Robotics and Automation
- **Computer**
  - Hardware
  - Other
  - Software
- **Medical**
  - Devices
  - Disease: Ophthalmology and Optometry
  - Other

- Rehabilitation
- **Sensors & Instrumentation**
  - Medical
  - Other
  - Position sensors

RELATED CASES

2023-524-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Vascular Anastomosis Device
- Low-Cost, Multi-Wavelength, Camera System that Incorporates Artificial Intelligence for Precision Positioning
- Non-Invasive AI-Based Retinal Inflammation Detection and Severity Estimation Using OCT B-Scans
- Headset with Incorporated Optical Coherence Tomography (OCT) and Fundus Imaging Capabilities

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