<https://www.ultracane.com/>

UltraCane uses ultrasound sensors for detection of both frontal and upper obstructions. However they can’t be used in heavy rain and provide minimal haptic feedback and no auditory feedback.  
  
The device is situated on the handle. However you need to buy the system with their own cane and can’t incorporate your own cane.

It also can’t detect objects when navigating over long grass, rough or stony ground and ultrasound sensors can have problems when near reversing cars. Also other canes of the same type can interfere with one another.

This cane can’t detect sloping of terrain such as kerbs and or stairs.

It uses 2 modes for distance short & long.

<http://smartcane.saksham.org/>

Smart cane uses Ultrasonic sensors used for detecting knee and head obstructions but doesn’t cover floor & sloping issues and offers varying grips.

It offers sensor distance modes – short and long.

It can be incorporated with the user’s own blind stick.

Protects against light rain but not heavy rainfall.

Covers minimal auditory output but does offer haptic feedback.

# Blind Simulator Solution idea:

Create single device that can be attachable/detachable to existing blind sticks and will include latching device that can connect to a variety of blind stick sizes / types.

Use 3 sensors either ultrasound, infrared or ultrasonic.

* 1st facing front direction this will cover all frontal objects on both ground and mid height for user such as work signs, lampposts, fences etc.
* 2nd 45 degree angle upwards, this will cover overhanging objects such as branches or obstructions mid-air that could impact on the user’s head region.
* 3rd angled at end of stick or below handle, this will cover terrain sloping, stairs and gaps as well detecting terrain change.

Detection will use these sensors and provide a tonal auditory output stating how close the object is there will also be a vibrational output to indicate the distance to the object.

System will work on multiple terrains and not be affected by additional sticks or vehicles technology.

Auditory tones will use scaling tones to indicate closeness and vibrations will incorporate a tempo increase of vibration based on the closeness of the object.

Handle system will incorporate a crutch-like handle that will wrap around the user’s wrist for vibration feedback around user’s hand and wrist.

There will be mode settings set on the device for output:

* Auditory output – A short high pitch sound will play if selected.
* Vibrational output – A short vibrational pulse will play if selected.
* Both outputs – Both selection outputs will be played if this option is selected.

Power settings for the device will be location on the other side of the handle and will offer 3 options:

* Power Off - This turns off the device to save battery
* Short Range mode – This will set the frontal sensor to handle a small distance ahead like 2.1 metres in front and will be represented by a short beep / vibrational pulse to indicate it is selected.
* Long Range Mode – This will set the frontal sensor to handle a longer distance ahead like 4 metres in front and will be represented by a longer beep / vibrational pulse to indicate it has been selected

If battery is running low it will provide a 3 burst beep / vibration which will loop every 30 seconds. But the device will remain unaffected and continue to work. If the battery does runs out, then it will play a continuous beep / vibrational pulse before playing a single beep / pulse before turning off.

These settings will play either a beep or pulse based on the previous output setting.

System will be watertight so is not effected in varying magnitudes of rainfall.

Charging of system will use a micro-usb cable for charging lithium ion batteries it will also hold storage below the handle for a power bank to be stored for charging the device on the go.

As device can be re/detached off blind stick charging can be rather simple.

Pricing will be rather cheap staying within range of £30-£50

Equipment required for hardware prototype:

* Resistors
* Capacitors
* Transistors
* Integrated Circuits
* Ardunio Uno
* Wires
* Breadboard
* Lithum Ion Battery
* Micro usb cable
* Ultrasound Sensors
* UltraSonic Sensors
* Infrared Sensors
* Printed Circuit boards for reproduction
* Plastic housing for storage and attachment
* Coin Motors
* Solenoid Motors
* Pneumatic Motors
* Speaker component