



SONOVISION LLC

The SonoWand

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Advanced Technology for the Severely Visually Impaired

- SonoVision LLC
 - Our goal is to develop technology for visually impaired people to increase their awareness of their surroundings
 - Allow them to confidently maneuver in unfamiliar surroundings
 - Enjoy freedom of movement

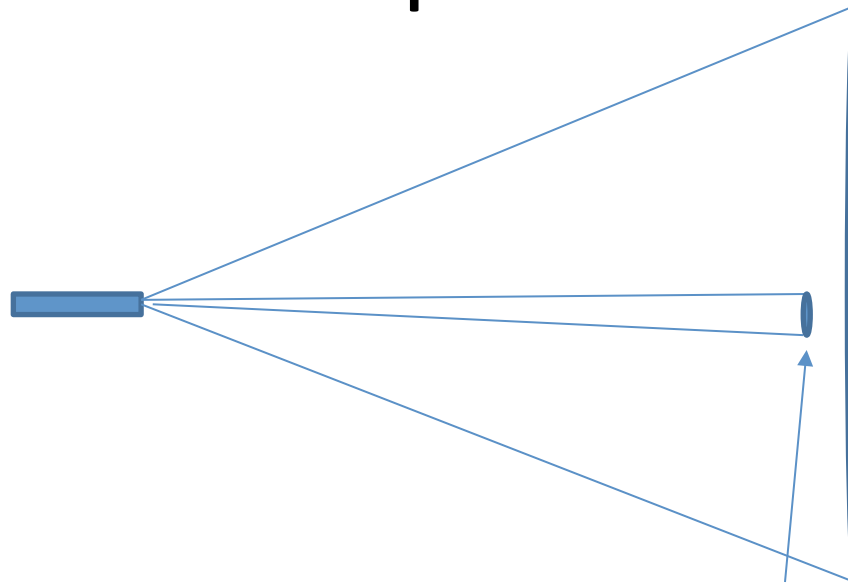
Our first product is the SonoWand

The SonoWand

A High Resolution Ultrasonic Sensor

- The SonoWand
 - detects distance and translates it for the visually impaired user via acoustic frequency
- High spatial resolution due to super-high ultrasonic frequency
 - Operates at 20 times maximum of human ear
 - Other ultrasonic devices operate about 5 times less
 - Output beam is very narrow – about 5 inches

SonoWand Spatial Resolution is Superior



Enables user to:

- Find and identify smaller objects

- Go up and down stairs

- Detect drop-offs and under-hangs

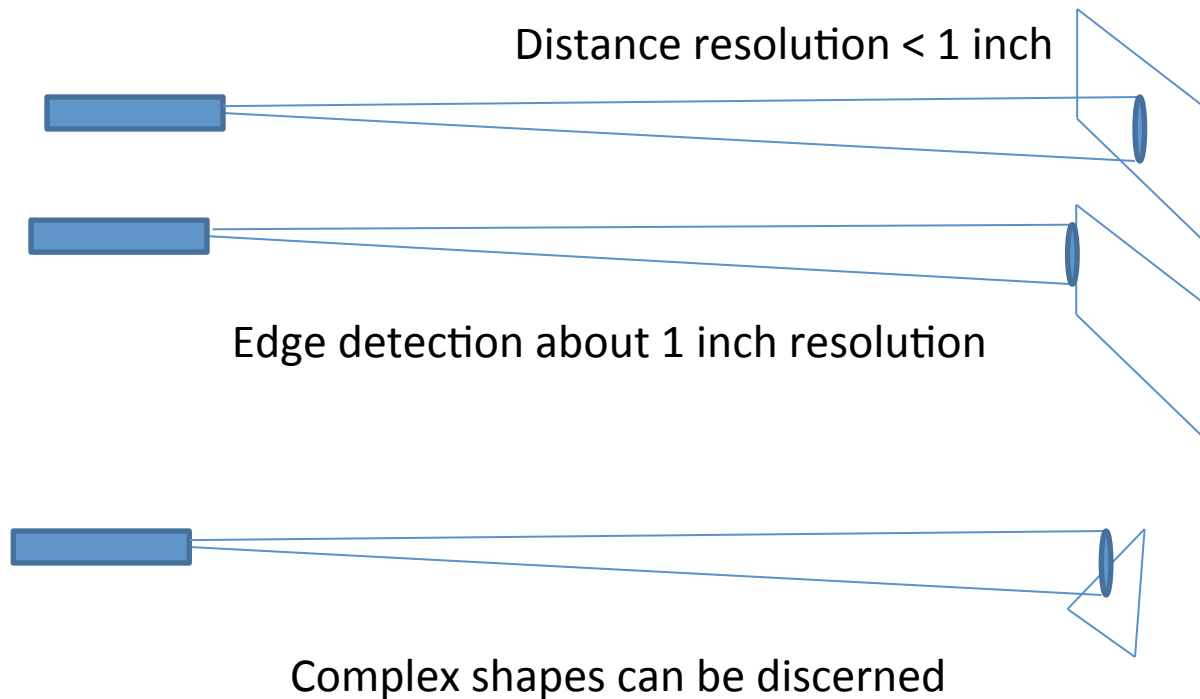
- Distinguish close objects, such as people

 - Moving nearer or farther?

- Quickly orient themselves in unfamiliar environments

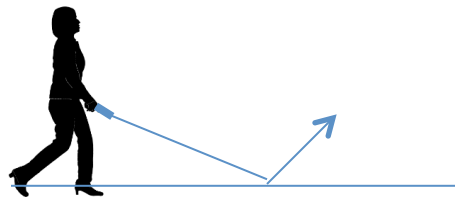
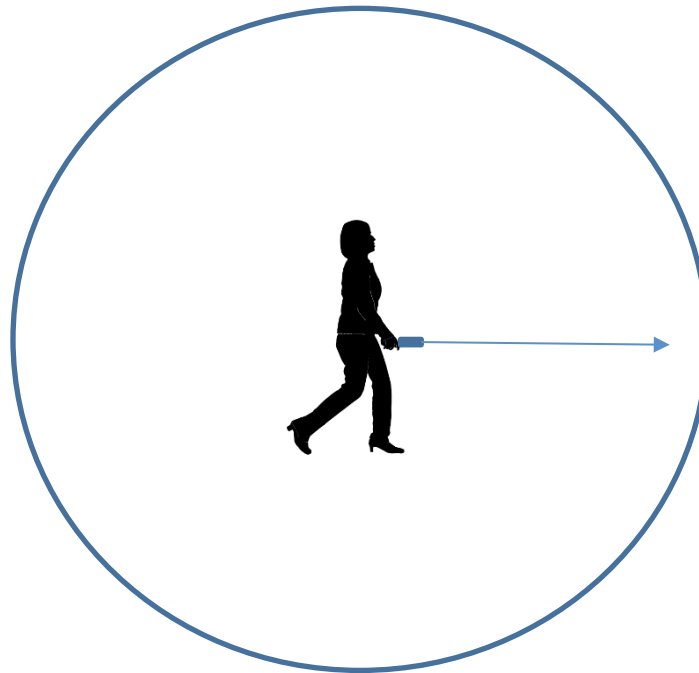
Max distance about 6.5 feet

Edge Resolution Obtained by Scanning

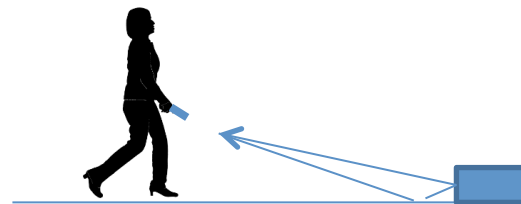


Mobility with the SonoWand

User can scan a sphere about 18 feet diameter



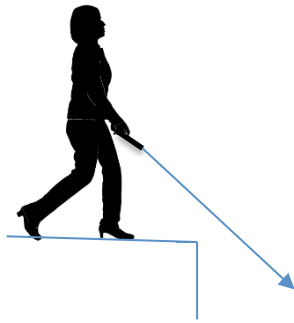
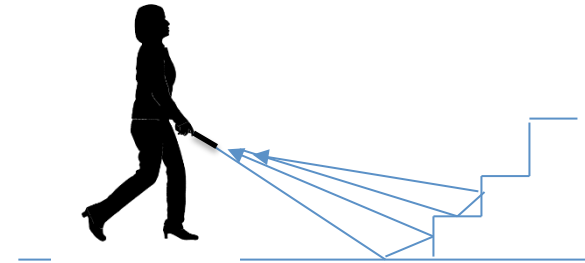
User can scan about 3 feet ahead, until no echo from bounce – this means no objects there



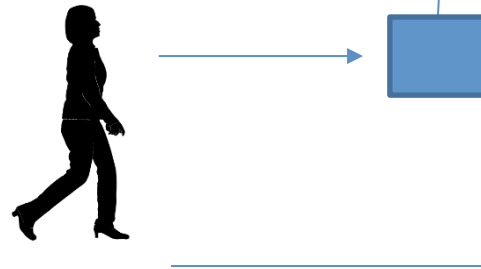
User can detect object about 6-7 feet away from secondary bounce

Mobility - continued

User can detect stairs from audio pattern of upward scan
Can navigate up or down stairs



Drop-offs or down stairs



Low-hanging objects

Doors
-open
-closed
-handles

Neuroplasticity and Imaging

- In a sighted person, visual information is used by the brain to form a detailed 3D image
- In the absence of visual information, the brain may use other types of information in a similar manner
 - Tactile, as in Braille reading
 - Audio, as in echolocation
- The SonoWand provides both audio and tactile information
 - The challenge is to teach the user how to understand it

Imaging Pathways in the Brain

- Experiments show that visually impaired people can use similar imaging pathways as sighted, using audio and/or tactile information
- For late-onset blindness, pathways have been set, can be retrained for audio/tactile
- For congenital blindness, similar pathways can be activated
- Best situation is to train very young children

Our Vision and Goal

- First – the SonoWand is used in conjunction with the white cane
- Next - the SonoWand is used to freely move in unfamiliar environments
- Finally – the second or third generation of children are not aware of blindness as an impediment