VibroGuide

Tactile Guidance for Blind Athletes

MOVE UNITED

VibroGuide

Tactile Guidance For Blind Athletes

"I can feel the direction to my guide.
It's like a heartbeat that points me
in the right direction."
– Scott, blind veteran

VibroGuide Design Requirements:

- **Enhanced Safety**
- **Follow-me Outdoor Sports**
- **Lower Hearing Dependence**
- **Off-Grid Environments**
- **Durable / Waterproof**
- **Lightweight Vest**
- **Hands Free Operation**
- **All Day Battery Life (6-8 hours)**

VibroGuide Inventor, Jim Riley

BACKGROUND:

- **US Marine Corps veteran – active + reserve (6 yrs)**
- **Education and Career in Software / Electronics Engineering (38 yrs)**
- **ACA Certified Whitewater Kayak Instructor (30 yrs)**
- **ACA Adaptive Kayaking Instruction Endorsement (12 yrs)**
- **Team River Runner – Volunteer / Chapter Coordinator (17 yrs)**
- **U.S. Dept Veterans Affairs - Innovation Network (2 yrs)**
- **Experience coaching veterans challenged with:**
  - Post Traumatic Stress Disorder
  - Traumatic Brain Injury
  - Blindness / Visual Impairment
  - Amputation
  - Spinal Cord Injury
  - Substance Recovery

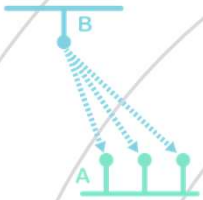
VA | U.S. Department of Veterans Affairs

iNET greenhouse

TEAM RIVER RUNNER
HELPING OUR WOUNDED VETERANS

VibroGuide Technologies

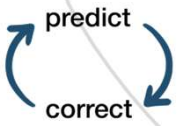
VibroGuide merges multiple technologies to augment guidance of blind and visually impaired (VI) athletes.



Angle-of-Arrival Direction Finding

Ultra Wideband Ranging

Extended Kalman Filter



Bluetooth Low Energy

SMARTBEACON TECHOLOGY

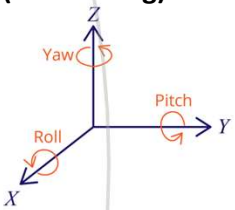
- Bluetooth Low Energy Beacon
- ESP32 Microcontroller
- Ultra-Wideband Ranging
- Text to Speech Audio
- WiFi Network Communication
- Emergency Signal Loss Alert

VIBROGUIDE VEST TECHNOLOGY

- Angle-of-Arrival Antenna
- ESP32 Microcontroller
- Ultra-Wideband Ranging
- Speech Recognition
- Text-to-Speech Audio
- WiFi Networking
- Inertial Measurement (Tilt Sense)
- VibroTactile Human Interface

Vibrotactile Sensory Connection

Inertial Measurement (Tilt Sensing)

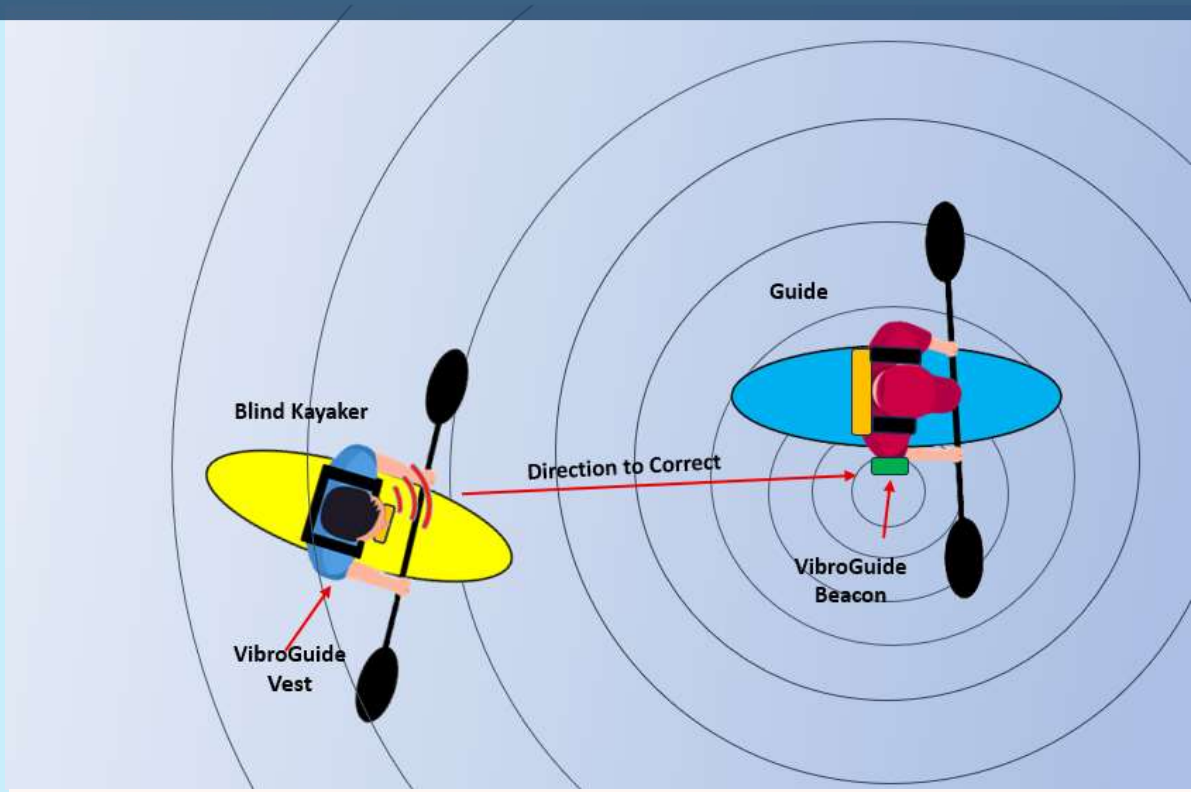


Speech Recognition

Example of VibroGuide Tracking

How A Blind Kayaker Stays On Track:

1. A leading guide wears a SmartBeacon on their arm or shoulder strap.
2. A blind kayaker follows wearing a life jacket fitted with VibroGuide.
3. When blind kayaker is directly behind their guide, they feel a heart-beat like pulse in the center of their life jacket.
4. If the blind kayaker veers right (or guide turns left), the pulses immediately shift to the left side of vest, indicating a correction is needed to that side.
5. As blind kayaker corrects and returns to tracking on guide, the pulses immediately shift back to the center of the vest.
6. Distance between guide and blind kayaker is approximated by speed of pulses:
   Faster = closer to guide Slower = drifting backward
7. Using Alexa-like voice commands, blind kayaker can change mode, audio or tracking settings for different sports.



Key Points:

- Guide can be more vigilant – less need for shouting or rubber-necking.
- Hands-free guidance allows better control for <u>both</u> kayakers.
- Blind kayaker's hearing channel is freed up for conversation, description of environment or just the quiet, ambient sounds of nature.

VibroGuide Devices

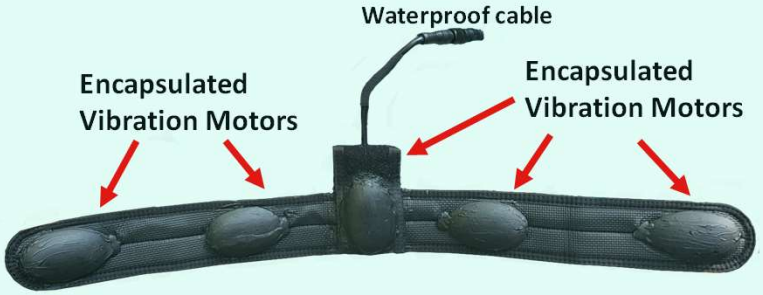
SmartBeacon

Beacon armband and belt-clip

VibroGuide Sports Vest

Vest components held in place with industrial hook-and-loop for fast removal and transfer.

Vibration Belt (inside view)



VibroGuide Life Jacket

Watersports

Direction Orientation

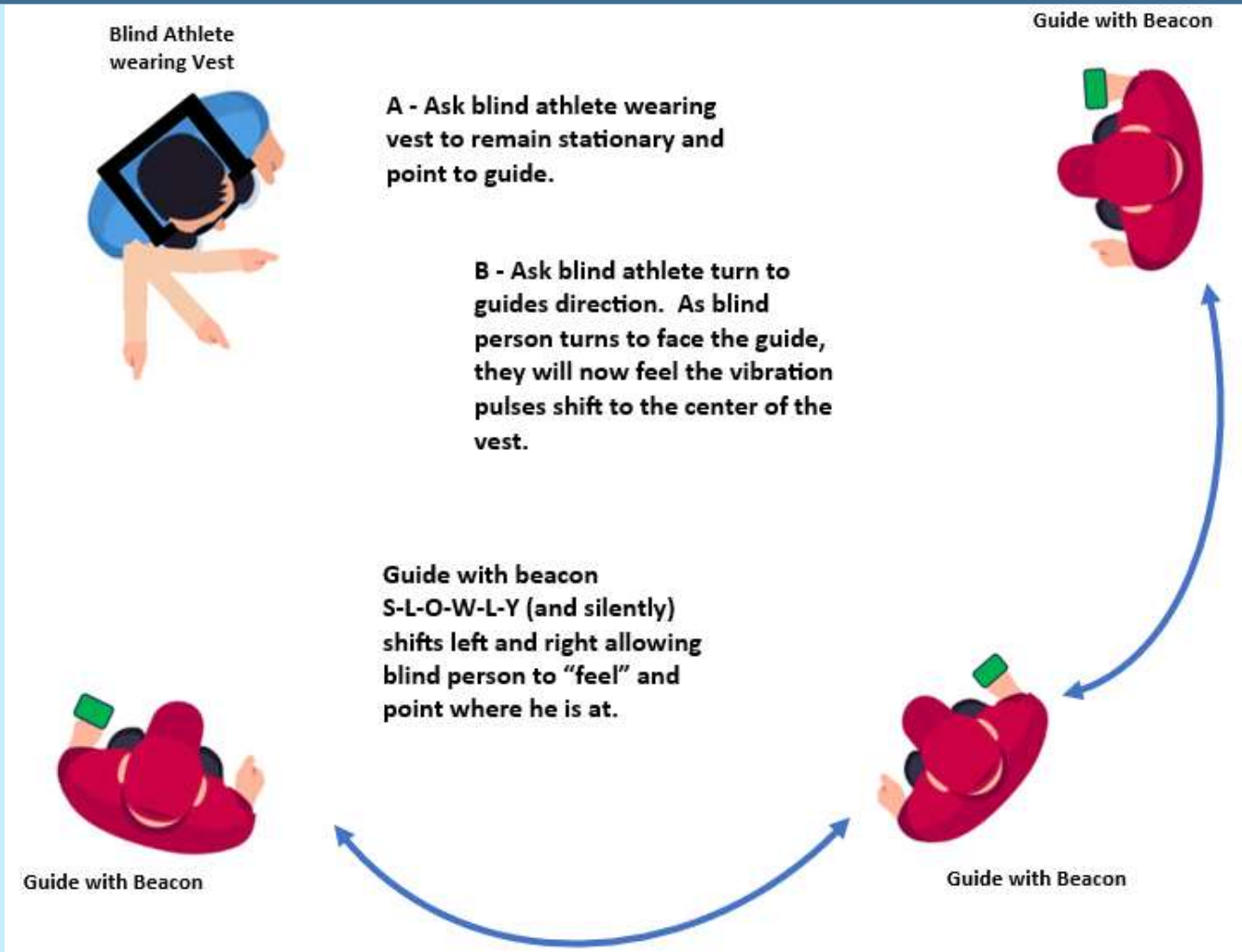
How VibroGuide informs direction:

1) Ask the vest wearer to stay in one place and point with their hand to the guide who is s-l-o-w-l-y moving to the left or right of the vest.

This indicates to the guide that the blind athlete can successfully track on the beacon.

2) Ask the guide to remain stationary and ask the vest wearer to slowly turn right or left to learn how the vibration pulses shift in the vest when they may veer off course.

This indicates how the vest wearer can always find their way back to the guide.



Distance Orientation

How VibroGuide informs distance:

1) With the guide standing approximately 10 feet in front of the vest wearer, double-press the START button on the SmartBeacon.

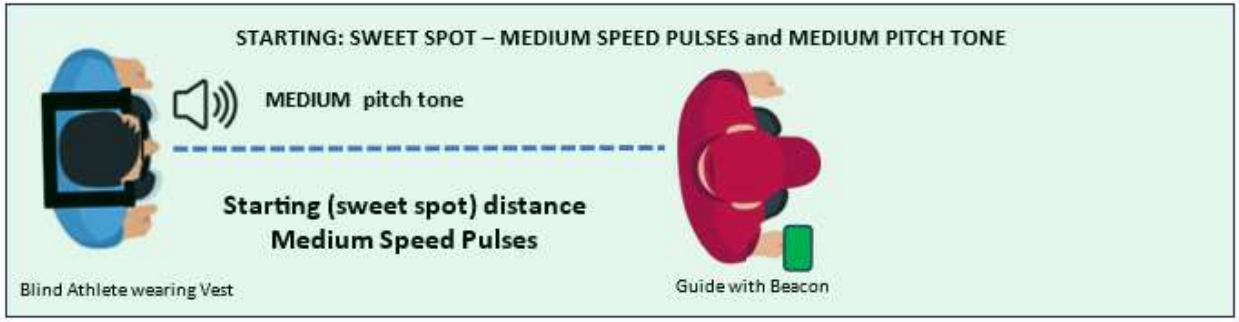
This will start the vest vibrating, a medium pitch pulsing tone will be heard and the vest will announce "*START… SPACING… 10 FEET*" This is what is known as your "sweet-spot" or… desired guide distance.

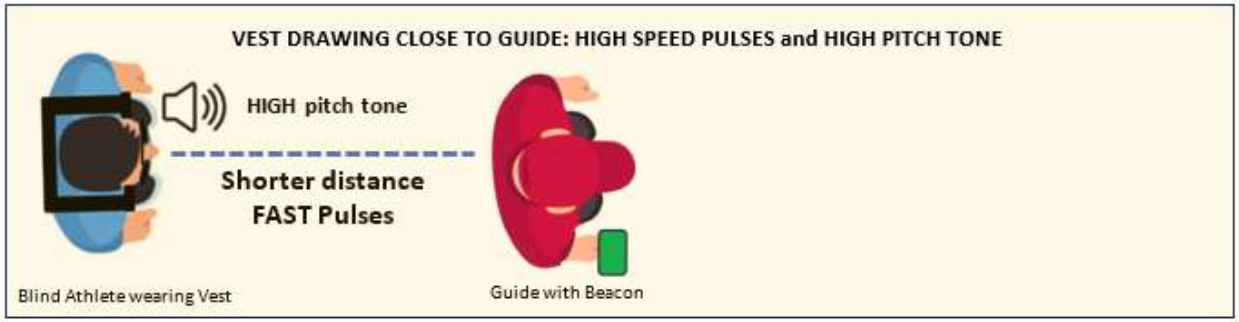
2) Ask the vest wearer to walk several steps closer to the vest so there is a shorter distance between.

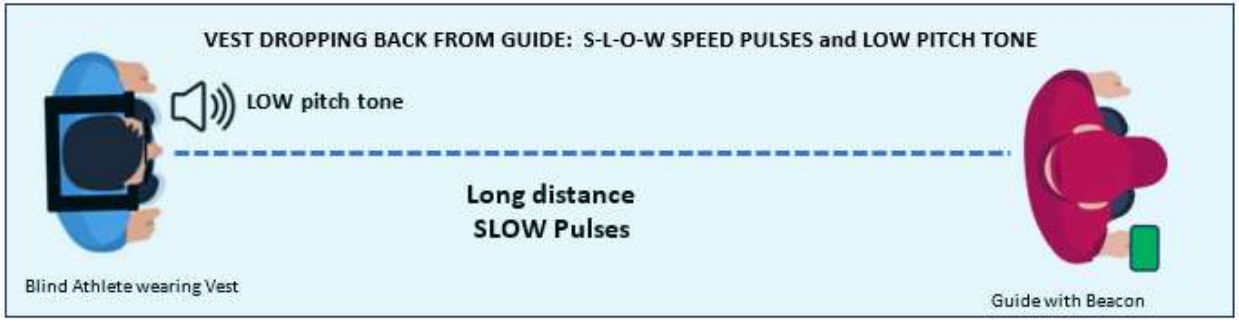
This will cause the pulsing tone to not only speed up, but will also cause the tone to be higher pitched.

3) Ask the guide to walk further away than the starting distance of 10 feet (maybe 15 feet).

This will cause the pulses to slow down and the tone heard in the vest will be lower pitched.







VibroGuide Sports Possibilities

Hiking

Skiing / Snowshoeing

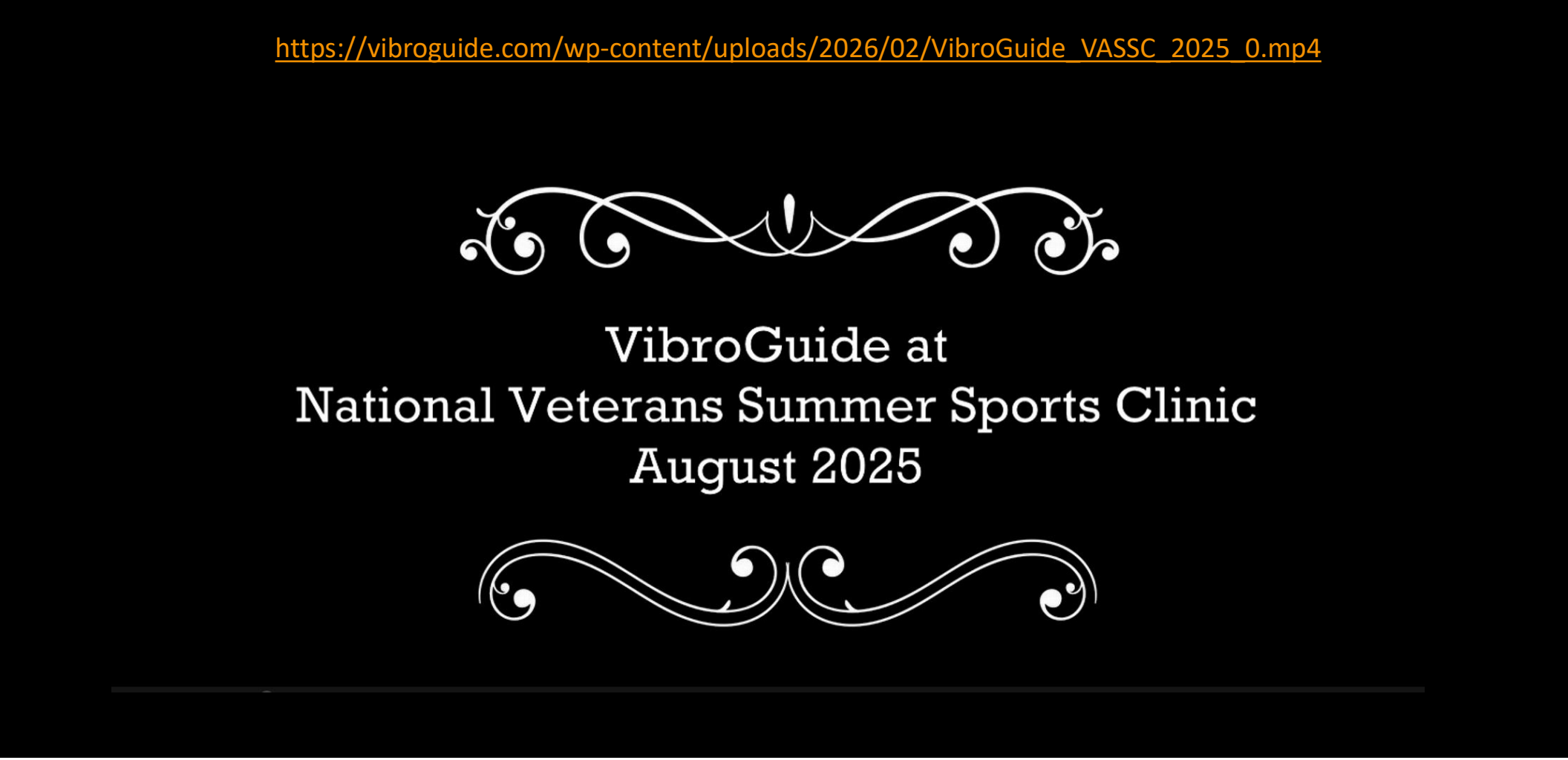
Cycling

Rafting / Inflatables

Kayaking

VibroGuide Kayaking Video

https://vibroguide.com/wp-content/uploads/2026/02/VibroGuide_VASSC_2025_0.mp4



VibroGuide Development Collaboration

TEAM RIVER RUNNER - 501(c)(3) non-profit, Rockville, MD
Provided the inspiration, adaptive education and support for this project as well as many awesome experiences working with challenged veterans at clinics all over the United States.

US DEPARTMENT OF VETERANS AFFAIRS – VHA Innovators Greenhouse Network
Provides advise, expertise and test opportunities with iNET – VA network of therapists and specialists at facilities around the USA.

RENSSELAER POLYTECHNIC INSTITUTE, Troy, NY
Provides Computer Science and Engineering expertise, test opportunities and student research / collaboration on merging VibroGuide technology with Soundscape Community.

Invention Status: Patent Pending with the United States Patent and Trademark Office
Title: Apparatuses and Methods For Blind Athlete Guidance
Application#: 63/677,201
Application Type: Utility – Non-Provisional Utility Patent Application under 35 USC 111(b)
Inventor of Record: James N. Riley

Contact!

Questions or suggestions are always welcome!

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