



HeberHack 2026

SYMPHONIX

Airis-SH

Letting every gesture matter, with Smart Hover

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Theme: Healthcare





Abstract - “Airis-SH”

- Airis-SH is a Smart Hover-based assistive device for touch-free computer control.
- Designed for users with motor disabilities, autism and limited mobility.
- Includes a companion web-app for calibration, sensitivity control & gesture customization, similar to a smartwatch control app.
- Enables smooth cursor movements, clicks without buttons and navigation with simple gestures.
- Provides an affordable, accessible and user-adaptive interaction system.
- Enhances independence, comfort and inclusion in digital environments.



Fig. 2: Airis-SH Product Design



Fig. 1: Airis-SH MVP



Fig. 3: Reviewing sample gestures

Tiruchirappalli, Tamil Nadu, India
South Ramalinga Nagar Main Road, Thillai Nagar, Tiruchirappalli, Tamil Nadu 620017, India
Lat 10.816139, Long 78.671958
08/25/2025 12:28 PM GMT+05:30
Note : Captured by GPS Map Camera



Problem Statement

- Traditional mouse/ trackpad is difficult for users with **motor disabilities and autism**.
- **Unstable or limited hand movements** make digital integration challenging.
- Lack of inclusive, **touch-free solutions** for effortless computer control.
- Need for a system that understands **gentle gestures** and supports **independent access**.
- Existing assistive devices are **expensive, complex** and not accessible to everyone.

Current Autism Scenario:

- Tamil Nadu : 3-4 lakh individuals (approx.)
- India : 1.8-2.0 million children (1 in 68)
- Globally : ~62 million people (\approx 1 in 127)



Fig. 4: Live interaction with Autistic students in a school

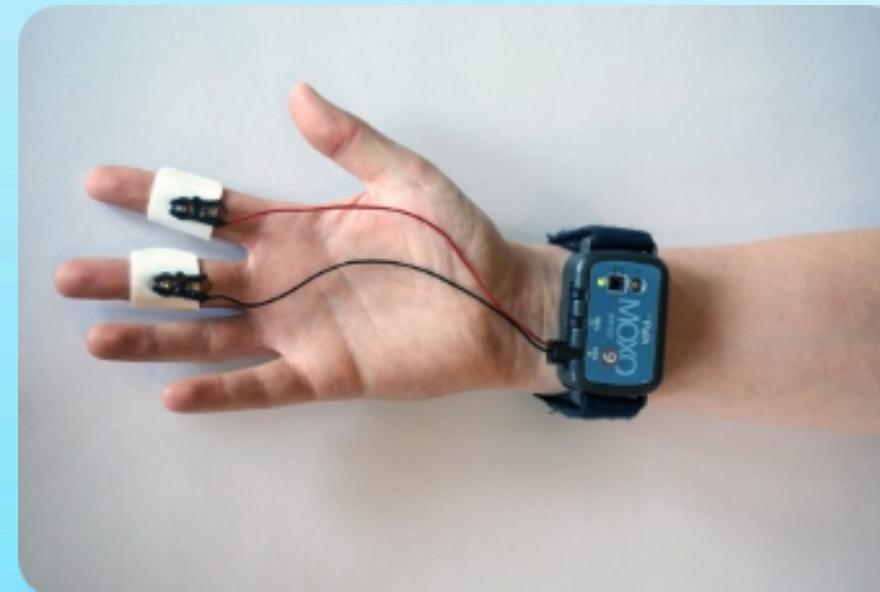


Existing Solution

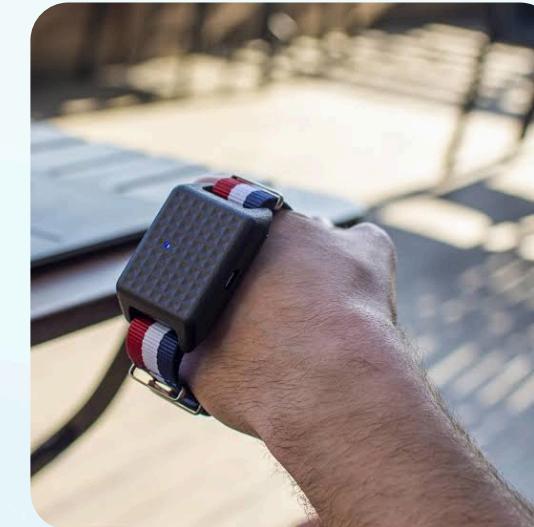
- **Tap Strap 2** – wearable hand device; controls mouse/ keyboard via gestures (~₹25,000)
- **Bird Controller** – finger-wearable; converts hand motion to remote/ gesture commands (~₹15,000)
- **AirPen** – touchless fingertip interface, controls devices in-air (research prototype)
- **Wearable Sensors for Autism** – tracks gestures to interact autistic behaviors (research)



Tap Strap 2



Bird Controller



Feathertail Ergonomic Mouse



AirPen



Joystick Mouse



Trackball Mouse

Limitations:

- Not tailored for autism support.
- Limited emergency or accessibility features.
- Most are prototypes or expensive.





Aim and Objectives

“Airis-SH”





Proposed Solution

“Airis-SH”

Touchless Control

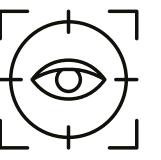


Smart Hover mouse replaces all clicks and buttons with smooth air-gesture interactions.

01



IMU Tracking



High-precision motion sensors translate natural hand movements into accurate cursor actions.

02

Comfort Mode



A sensory-friendly interaction mode designed specifically for autistic users' unique motor patterns.

03



Web-App Panel



Interactive dashboard for calibration, sensitivity control, gesture mapping and user customization.

04



Affordable Pricing



Cost-effective device under ₹2000, making assistive technology accessible to everyone.

05



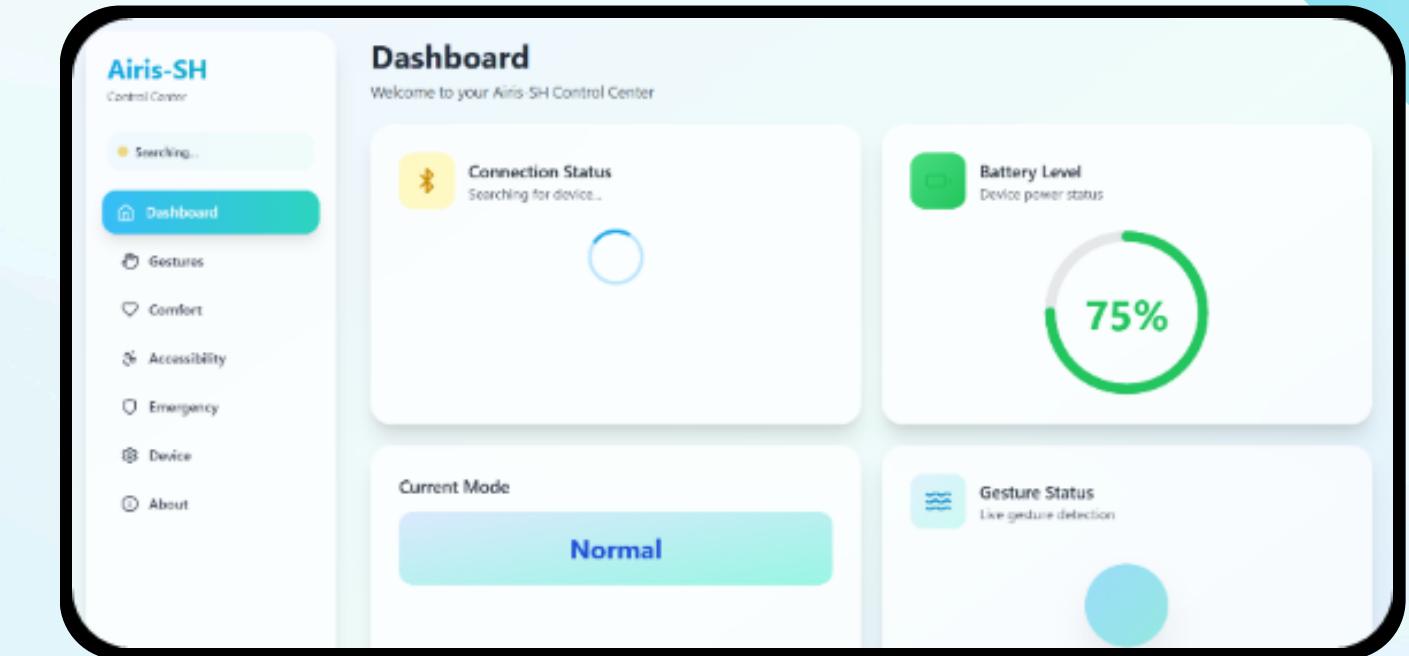
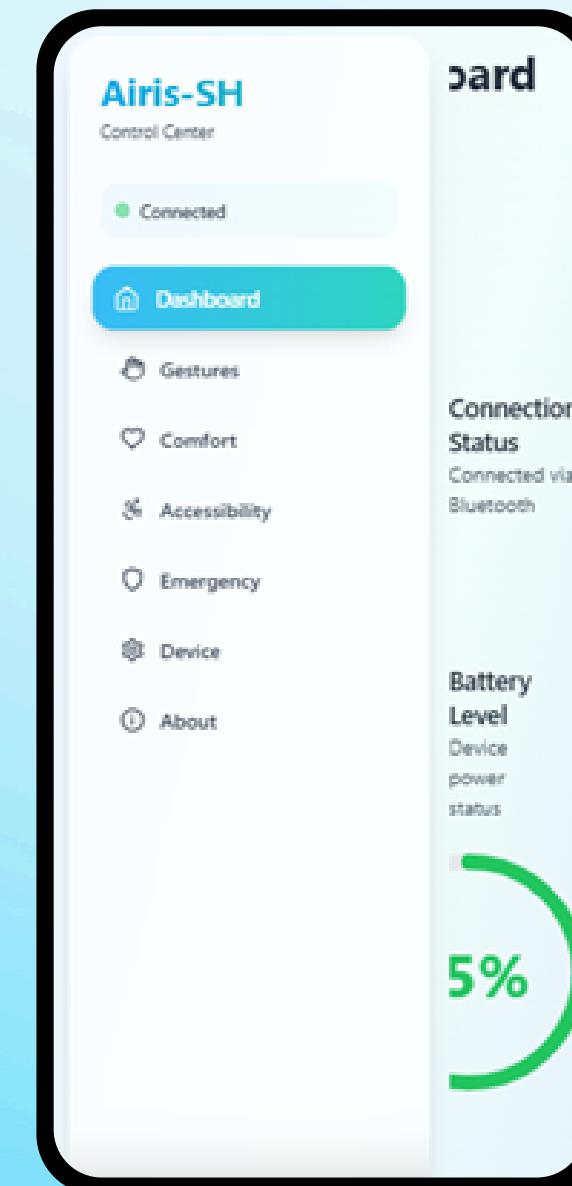
Technology/Tools Used

Hardware Components :

1. ESP32-S3 Mini
2. IMU / Gyroscope Sensor
3. Rechargeable Battery Module
4. Custom 3D-Printed / Wearable Chassis
5. PCB / Wiring Setup
6. USB Interface for Programming



Fig.: Official Airis-SH Website
- airis-zeta.vercel.app



Software Components :

1. Arduino IDE
2. Embedded C / Firmware Code
3. Web-App (HTML, CSS, JavaScript)
4. Bluetooth Integration Scripts



Target Group

Autistic individuals, kids with coordination difficulties



Everyday users who want simple, touch-free interaction



Neurodivergent Users

01

Mobility-Limited Individuals

02

General Users

03

Gamers & Tech Enthusiasts

04

Motor-disabled users, elderly users with limited mobility



Users who prefer gesture-based, futuristic control systems





Societal Impact & Benefits

40% of autistic users have motor issues

1 in 100 children has autism



Digital Independence

Empowers autistic and motor-disabled individuals to use computers confidently without relying on others.



Affordable Accessibility

Brings assistive technology within reach for low-income families, therapy centres, and underserved schools.



Inclusive Learning

Supports equal participation in education by enabling disabled students to learn, communicate, and create independently.

1 in 6 people face mobility challenges

1.3B people live with disabilities

75M+ autistic individuals worldwide



Emotional & Social Well-being

Reduces frustration and isolation, promoting dignity, confidence, and awareness about inclusive technology.

How Autism Diagnosis Varies Around the World

Number of children diagnosed with autism spectrum disorder in selected countries in 2021 (per 100,000)



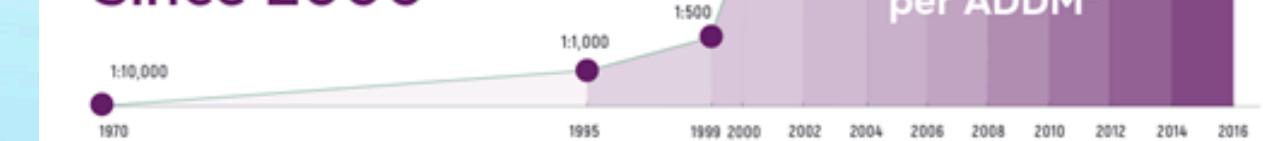
Important to note: High diagnosis rates can also indicate good detection and diagnosis capabilities.
Source: World Population Review



statista



Autism prevalence has increased
178%
Since 2000



thetreetop.com

*ADDM (Autism and Developmental Disabilities Monitoring Network)



Airis-SH

AIR + IRIS + SMART HOVER

Cost of the Product

01

Budget-Friendly Pricing

Base model priced below ₹2000 for maximum accessibility.



02

Advanced Variant

Enhanced model at ₹2200–₹2600 with extra sensors and calibration features.



03

Cost Advantage

Nearly 10× cheaper than existing assistive devices priced ₹15,000–₹40,000.



04

Designed for Everyone

Affordable for schools, therapy centres, NGOs, and families.



05

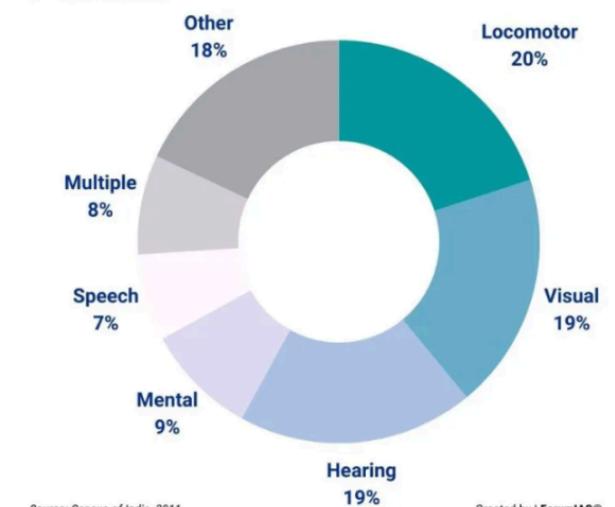
Scalable & Durable

Low production cost, durable components → ideal for mass manufacturing.



PwDs by Disability

Proportion of disabled Indian Population by type of disability



Source: Census of India, 2011

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Pictures and Videos



Airis-SH
Control Center

Dashboard
Welcome to your Airis-SH Control Center

Connection Status
Searching for device...

Battery Level
Device power status
75%

Current Mode
Normal

Gesture Status
Live gesture detection

Comfort Mode
Calming settings designed for autistic users

Anti-Shake Strength 9 / 10

Cursor Smoothing Level 7 / 10

About Comfort Mode
Comfort Mode is specially designed for autistic users. It reduces cursor shake, smooths movements, and provides calming LED animations to create a more comfortable and less overwhelming experience.

Airis-SH
Control Center

Connected

Dashboard

Gestures

Comfort

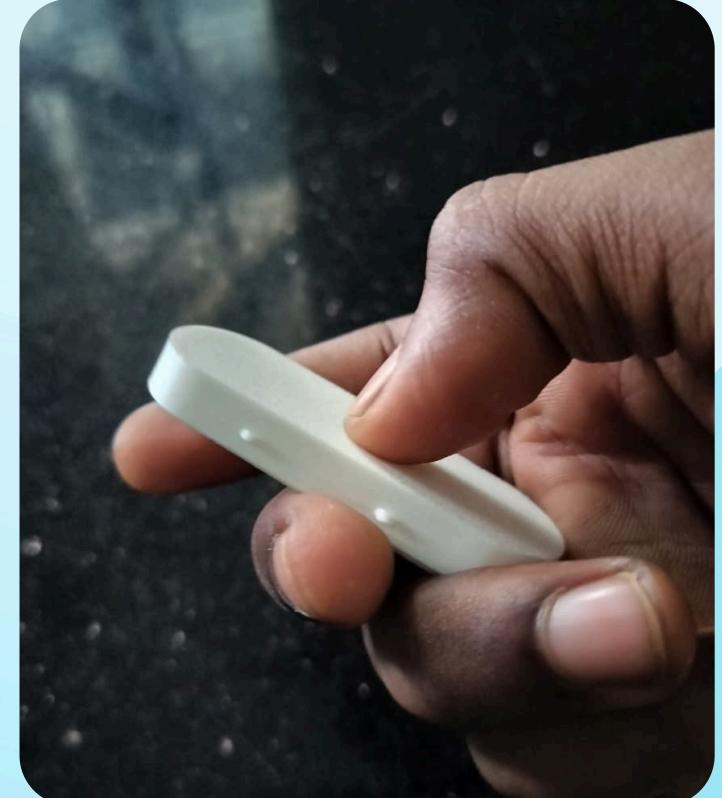
Accessibility

Emergency

Device

About

Designed for accessibility
v1.0.0



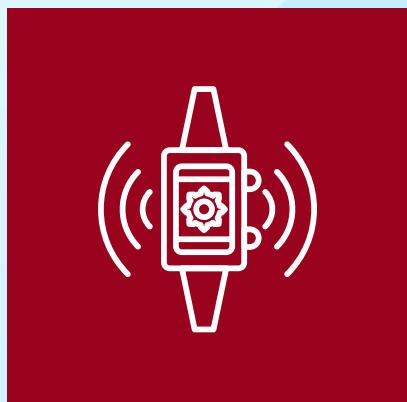


Future Enhancement



AI Gesture Learning

AI-based gesture learning for smoother and personalized control.



Advanced Wearable:

Advanced wearable version with improved ergonomics and comfort.

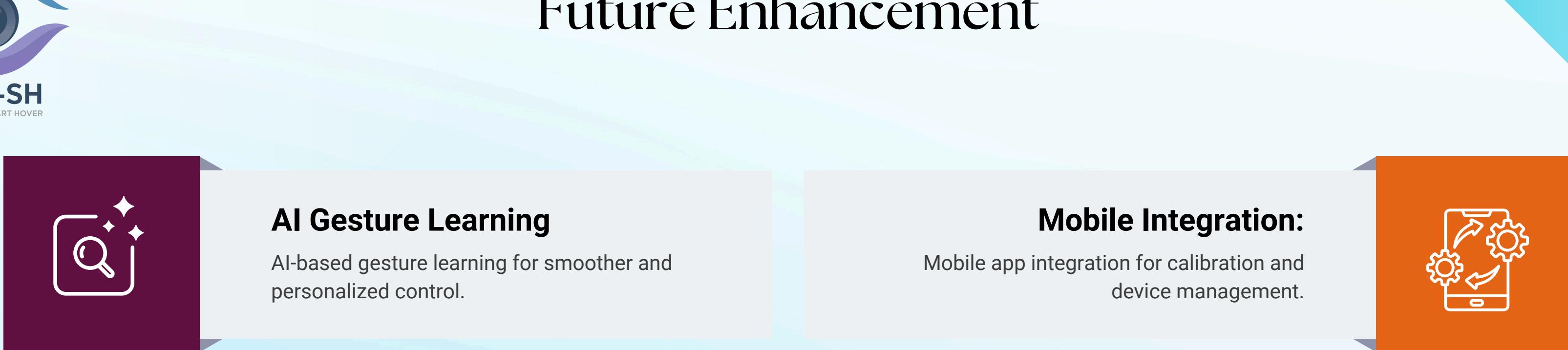


Custom Mapping:

Custom gesture mapping for productivity and gaming use-cases.

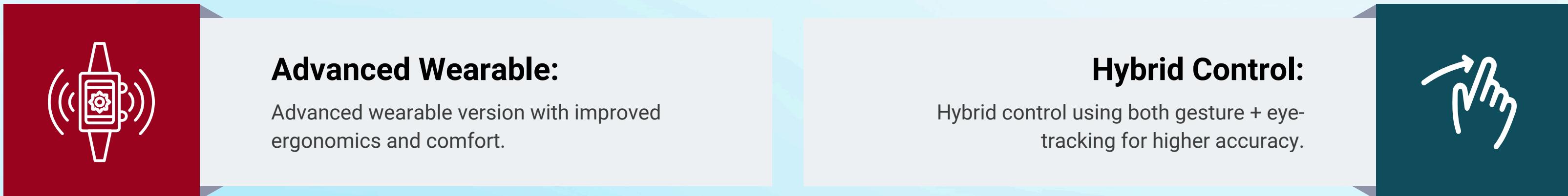
Mobile Integration:

Mobile app integration for calibration and device management.



Hybrid Control:

Hybrid control using both gesture + eye-tracking for higher accuracy.



Cloud Sync:

Cloud backup of user profiles for cross-device accessibility.



References

- World Health Organization, 2023 – Global prevalence of Autism Spectrum Disorder (1 in 100 children) and challenges in functional communication.
- World Health Organization, 2022 – Disability population data (1.3 billion people) and barriers in digital accessibility.
- American Journal of Occupational Therapy, 2020 – Fine-motor coordination difficulties in autistic individuals impacting mouse/keyboard usage.
- Field Visit Source: Spastic Society Field Observation, 2024 – Real-world insights on motor challenges, sensory processing issues, and user requirements for touchless devices.

“Innovation is not about creating machines; it’s about creating hope”