

# Emerging Technology

## Are You Ready for This??

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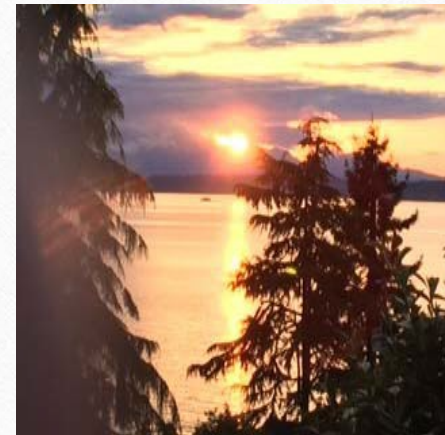
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Washington Assistive Technology Act Program  
WATAP



Image credit: TechRadar

# Hello from the Pacific Northwest





# Washington Assistive Technology Act Program

- Provide Assistive Technology resources and expertise to all Washington residence with disabilities
- University of Washington Center for Technology and Disability Studies (UWCTDS) is the lead agency for WATAP
- 39 Counties with primary industry being:
  - Aerospace
  - Agriculture and Fishing
  - Forestry
  - Clean Technology



# **WARNING**

## **TECHNOLOGY DISCLAIMER**

### **This is a rapidly changing world**

**Be aware that some of the following information may be disturbing to some people**

**Change is not easy for some people**

**And that some of the following information is already out of date!!**



# Encyclopedia Britannica

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- In 1985 a 32-volume set cost \$1400
- First CD-ROM 1989 (\$1,000), when they turned down partnership with Microsoft. Thought MS too young and likely unsuccessful
- Microsoft CD Encarta published successfully in 1993 for \$395
- Google officially available in 1998

# Emerging Technology Explosion

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- **Devices are getting smaller, lighter, cheaper, and more capable**
- **Electronics are currently being incorporated into almost everything!!!**
- **Technology for Information and Communication are the fastest growing industry**
- **The way people connect, communicate and conduct transactions have been most impacted by cellular network technology, Wi-Fi, and cloud computing**
- **Nearly a third of the most important skillsets in 2025 will be comprised of technology skills not yet considered imperative to the job today.**

# Technology we didn't have in year 2000

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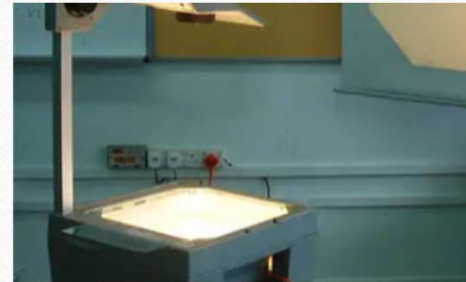
|              |      |
|--------------|------|
| Apple iPhone | 2007 |
| Flash Drives | 2000 |
| Google Maps  | 2005 |
| You Tube     | 2005 |
| Facebook     | 2004 |

Top selling Cellphone  
Nokia 310



# Everyday Technology That Has Become Obsolete “in 10 Years”

- Buttons
- Single Use Devices
- Stand Alone GPS Devices
- Backing up Data on CD's or Floppies
- Overhead Projectors
- MP3 Players





# Everyday Technology That Will Become Obsolete “in 10 more Years”

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## Current Technology

- Signatures
- Keys
- Car Sideview Mirrors
- Parking Meters

## Replaced with

- Biometrics- Eye, Face, Fingerprint
- Cell, Access Cards, Implanted Microchips
- Camera and interior mounted monitors
- Cellphone Apps (PayByPhone, MobileMeter)

# Digital Car Keys

BMW, Hyundai, Ford

**Widely Available 7-26-2022**

## Wallet Car Key App for Apple iOS 14

- Insurance Monitoring – Pay as you drive
- Start engine remotely
- Teenager controls
- Share car keys – family, employees
- Car Connectivity Consortium (CCC)



# Level Lock Plus \$330

## Door Locks are Continually Improving

- Digitally lock and unlock front door deadbolt
- Apple Home Key (Wallet app) anticipated to grow at 17.4% in coming years
- Level Lock Plus requires iOS 16.1 or later or Apple Watch starting with series 4
- Deadbolt accessed via: standard key, key card, Level Lock app, physical touch
- Voice controlled using Ring
- Continues to work on dead phone via Apple Power Reserve for up to 4 hours



# Touchless User Interface (TUI)

## “Touchless Technology”

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- The process of commanding a device via gestures, facial features or voice only.
- Currently used with faucet fixtures, door locks/openers, towel dispensers
- Technology anticipated to grow at 17.4% in coming years
- Concerns with accuracy, price and security
- Touchless technology in a vehicle improves safety while driving
- Positives and Negatives for varying disability groups



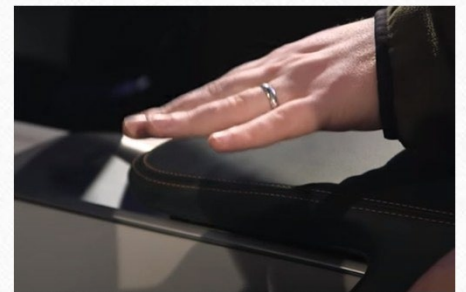
# ZKTeco Solutions

- Identify Identity
- Acceptable skin temperature
- Detect concealed objects
- Elevator control
- ID room location



# BMW Air Touch

- On/off media with a swipe of hand
- Change station – point thumb L or R
- Volume – circle finger motion L or R
- Follow voice commands
- Navigation, media, smart home commands
- Learns voices of vehicle riders



# BMW Gaze Detection “EASE”

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- Will be used with autonomous (self driving) cars
- Tracks what you're looking at outside of car and presents relevant information about it through interior media options
- The front windshield will become a full screen projecting that information
- Screen will offer driver three different modes of use:
  - Explore - with a focus on what's outside the window
  - Entertain - for watching movies
  - Ease - transforms the car into a “place of calm and relaxation.”

# Zero User Interface

## “Zero UI”

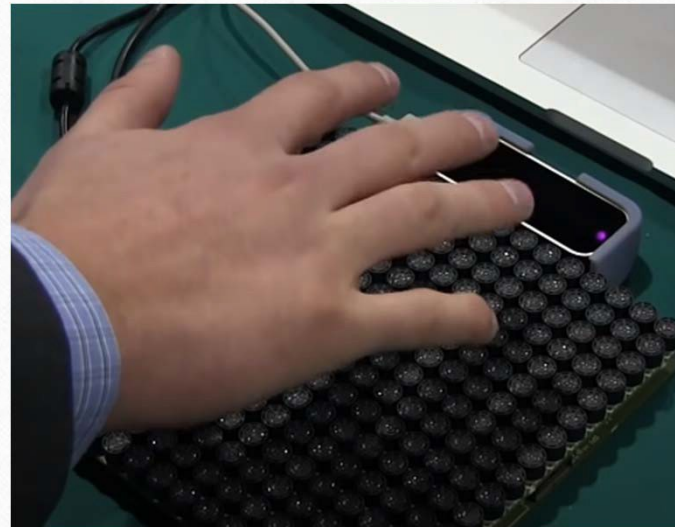


- Zero UI means there is no physical interface with a website or mobile app
- Current example is Nest Thermostat
- Focus is on Gaze, Gesture, Language or Behaviors
- Technology will learn “us” - not us learn “technology”
- Screens (cell) and monitors (computer) no longer needed for event activation
- Sensors will recognize who we are, what we need, want, like or ask for



# Ultra Haptics

- The science of creating the sense of touch in mid-air
- Imagine turning an invisible knob or pushing a button in mid air and feeling the button and tension of the activity
- Sound waves with precisely calibrated amplitude and phase (feels like forced air)
- The sound waves converge at a specific point in space, which when we place our hand over that area, we experience resistance on our skin



# Medical

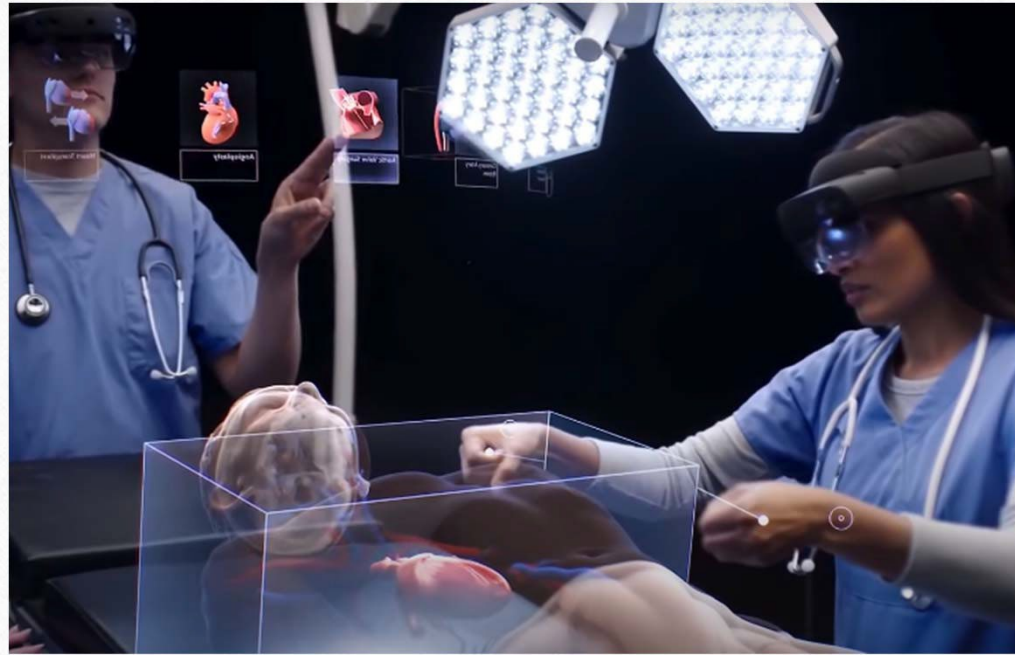


Image Credit:TechTeezy

# No More Injections!!!

(diabetes, fear of needles....)

- Pills will painlessly inject drugs into the lining of the stomach
- Each capsule contains several tiny injectors or “Nano Needles”
- Pills self-right on floor of the stomach
- At the base of the needle is a compressed spring held in place by sugar. When the sugar dissolves in the stomach, the needle is fired down into lining
- Technology proven to be effective on animals, but to date has not been tested on humans



# U-Scan Urinalysis

Withings U-Scan puts urinalysis in your toilet and can recognize the signature of a stream | TechRadar

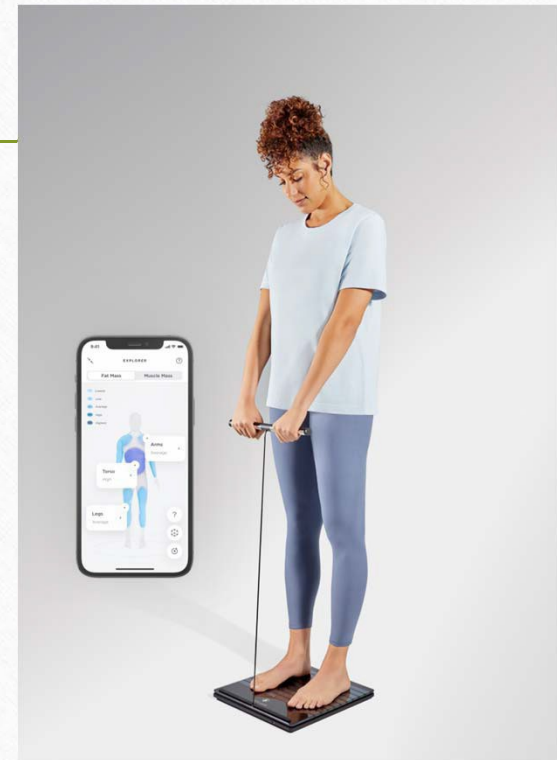
- Low-energy radar sensor ID's Individual using toilet
- Delivered to iPhone or Android -- \$499
- Acidity (pH balance), carbohydrate levels (ketones), vitamin C levels, and hydration (water balance)
- Also tests nutritional balance, and female cycle-tracking
- Withings is currently seeking FDA clearance



# Withings Body Scan

**“BODY COMP” \$210**

- Measure multiple body traits
- Uses sweat glands in the feet to detect and track a person's health
- Weight, heart rate, fat mass/muscle mass
- 6 lead ECG to track heart patterns
- Available January 2023
- [www.withings.com](http://www.withings.com)



# Neuralink

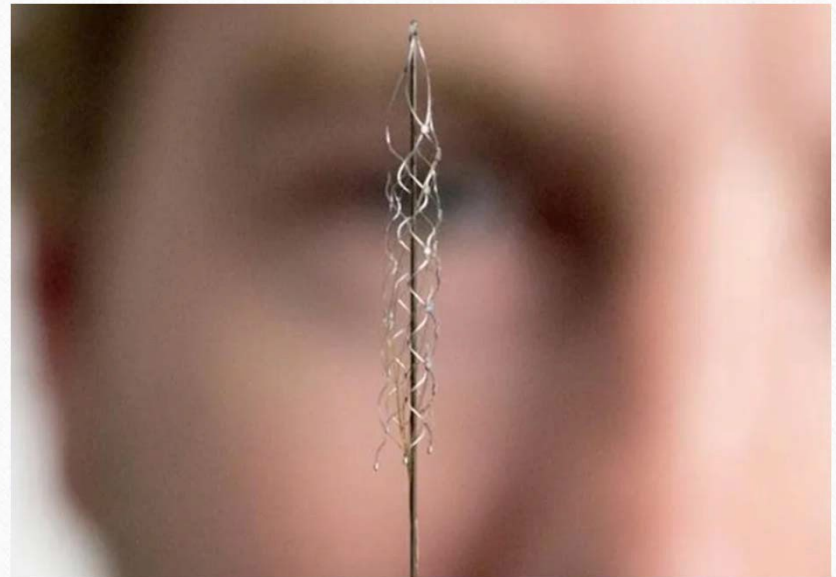
## Implanted Brain Interface Technology

- Elon Musk co founded the brain-interface tech company in 2016
- Tests in 2021 had a monkey playing Pong successfully
- Device consists of threads inserted into areas of the brain that control movement
- Initial focus on humans with sever spinal cord injuries
- Device goal will be to restore full-body functionality
- Awaiting FDA approval in 2023



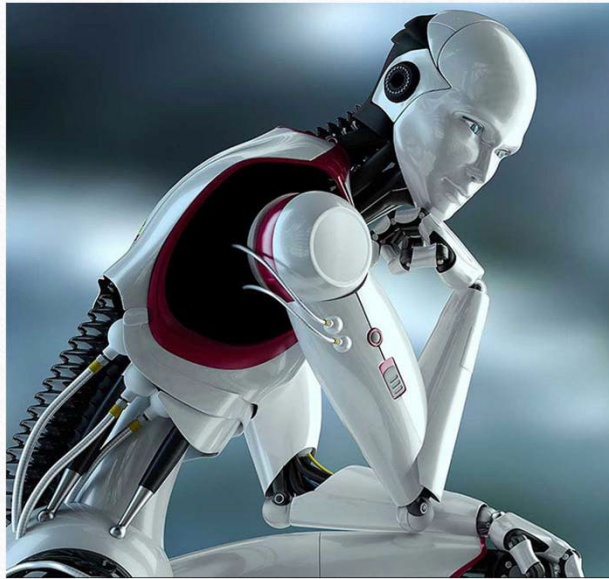
# “PARALYSED MAN FIRST TO SEND TWEET USING ONLY HIS BRAIN”

- **First direct-thought tweet completed on December 23, 2021**
- **“Hello World” by 62-year-old male with ALS**
- **Developer Synchron, California-based brain-computer interface company**
- **Brain implant the size of a paperclip**
- **Inserted through jugular vein to avoid invasive brain surgery**



# Robotics

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# Yanko Design Concept Stride Senze



Stride Senze

# Toyota Robotic Butler

- Concept



# Samsung Bot Handy

- In development: advanced AI to recognize and pick up objects of varying sizes, shapes and weights,
- Will be able to tell the difference between the material composition of various objects, utilizing the appropriate amount of force to grab and move around household items and objects.



# Samsung Bot Care

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- Prototype: Designed to use AI to recognize and respond to your behavior.
- It will be able to act as both a robotic assistant and companion.
- It will also learn your schedule and habits and send you reminders to help guide you throughout your busy day.



# Tesla Bot “Optimus”

## Humanoid Robot

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Will substitute human labor by accomplishing repetitive physical tasks.

- A prototype to be released in 2022
- Powered by a Tesla Full Self-Driving computer
- At 5’8”, it will be able to lift 150 pounds
- An information display will substitute for a face
- Elon Musk believes robots will resolve our labor shortage



# Robotic Harvesters



# TerTill

## Garden Weeding Robot



- Roomba Vacuum Cousin
- No programming required
- Solar powered & weatherproof
- Weeds up to 200 square feet.
- Runs intermittently, an hour throughout the day
- \$350
- [Tertill the Weeding Robot](#)



# Carbon Robotics

## “Autonomous Weeder”

- When you’ve got “acres to weed!”
- Combines GPS (GeoFence) and artificial intelligence (AI)
- Powerful lasers destroy weeds
- Runs day and night
- [Carbon Robotics](#)
- \$100,000+





# Travel

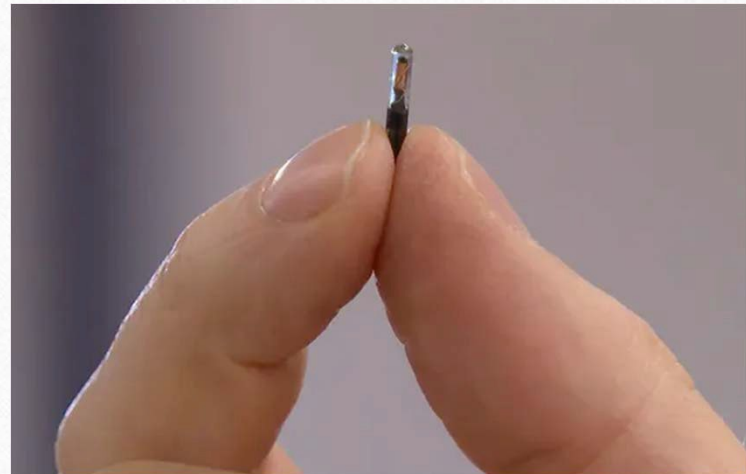
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# Passport Chip

- Person can be scanned to reveal their vaccination information
- Currently being used in Sweden
- Identification, medical history
- Also used for touchless payments

<https://www.foxbusiness.com/technology/swedish-covid-vaccine-pass-microchip-privacy-concerns>



# Tools

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# Meazor Digital Measuring Tool

## “Make Planning Home Modifications Easier

- \$229 -- 6-in-one Multifunctional Digital Laser Measuring Tool
- Rolling measurer, laser distance measurer, curve measurer, bubble level
- Pair with phone app to draw, edit, save, and study the results of measurements.



<https://hozodesign.com/products/MEAZOR>

# BioServo Iron Hand

- Sensors and motors in each finger automatically respond to the level of force that the wearer applies to his or her hand when lifting or gripping something resulting in less strain on the hand and arms.
- Can be worn via backpack or hip pack.



- [www.bioservo.com](http://www.bioservo.com)

# Neomano

- Korean Start-up company Neofect
- Wearable hand robot helps individual with hand paralysis do daily activities such as grabbing and picking up.
- \$2000; [www.neofect.com](http://www.neofect.com)



Images from Neofect website

# Nobi Smart Lamp Fall detection

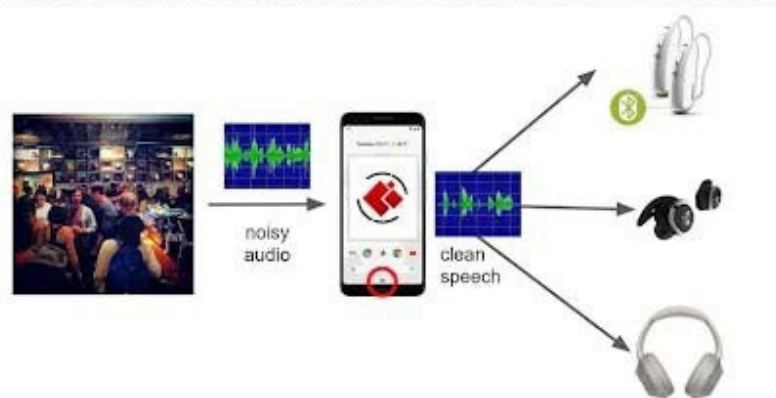
- If a fall is detected, the Nobi's speaker will ask if the resident is OK. If there's no response, the smart lamp will call the person's emergency contact list.
- \$2,500 to outfit "an average apartment," but doesn't specify how many smart lamps that would include or the amount of square footage each one can cover. In addition to the purchase price, you'll need to sign up for a \$19-per-month subscription. Alternatively, you can rent the equipment for \$119 per month, subscription included.



# Heard That APP

- App; iOS and Android
- Enhances speech by separating speech from noise and provides clear conversations
- Makes the hearing devices you already own work better, simply by using the smartphone you already own.

HeardThat   
More Voice. Less Noise.





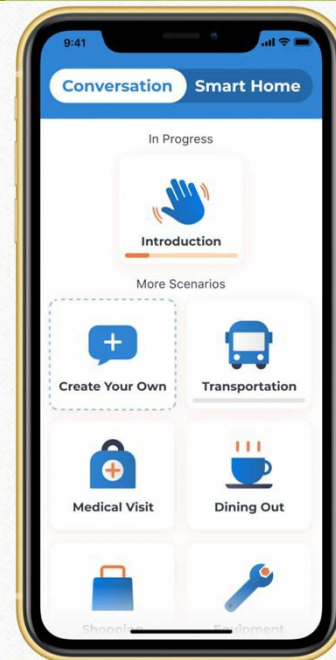
# XRAI GLASS

- Converts audio into subtitles in real-time
- \$379



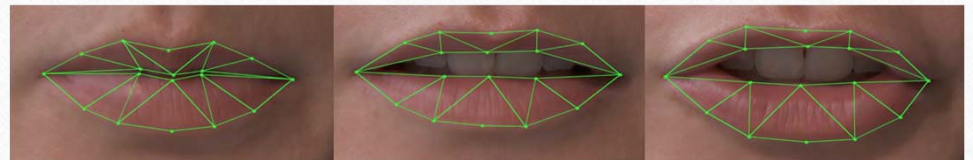
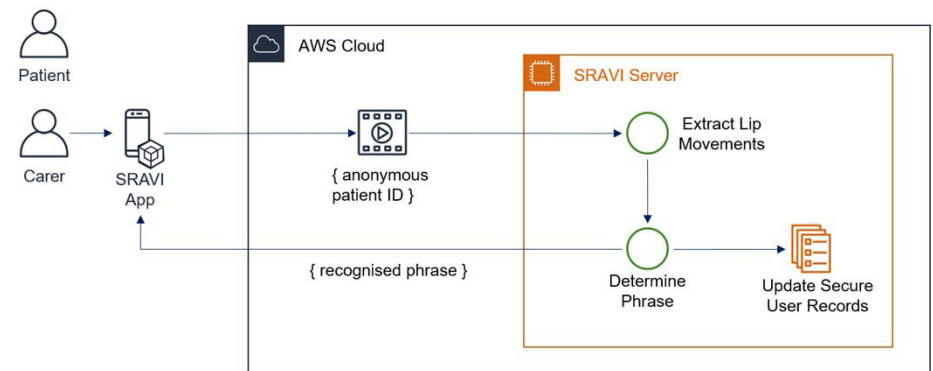
# Voiceitt App

- iOS app; subscription based
- Uses data from your speech, cadence, breath, and pauses
- Machine learning creates a dataset unique to a person's speech patterns.
- A team of speech and language experts annotate speech samples to calibrate and refine our algorithm, ensuring accurate prediction for the broadest range of speech.
- [www.voiceitt.com](http://www.voiceitt.com)



# SRAVI (Speech Recognition for the Voice Impaired)

- iOS app; monthly subscription; \$13
- SRAVI works by recording a video of lip movements using a mobile phone or tablet. The video is sent to the Amazon Web Services (AWS) secure servers.
- Data is encrypted at rest and during transit
- Once the video reaches our servers the technology detects and tracks the person's lip movements and converts those into text for your caregiver or doctor to see
- [www.sravi.ai](http://www.sravi.ai)



# CES 2023 Innovation Awards Program

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# Ashirase

- **Developed by Honda**
- Two-part walking navigational system that consists of an app and a wearable vibrating device connected via Bluetooth.
- Once connected, the app sends vibrating signals to the devices attached to the user's shoes.
- A pulsing forward vibration is an indication to move forward, right and left vibrations indicate turns, and both feet vibrating notifies the user to fully stop.
- Honda and Ashirase Inc. plan to sell the Ashirase in-shoe navigation system at the end of March 2023.



# WL1 Bidet Toilet Lift

Solution for toilet transfers and hygiene issues

Motor drive to assist with sitting/standing

\$3000



# Kizik “hands free shoes”

- Sizes for women, men, and children
- Approx. \$130
- <https://kizik.com/>



# BrailleWear Orami AI

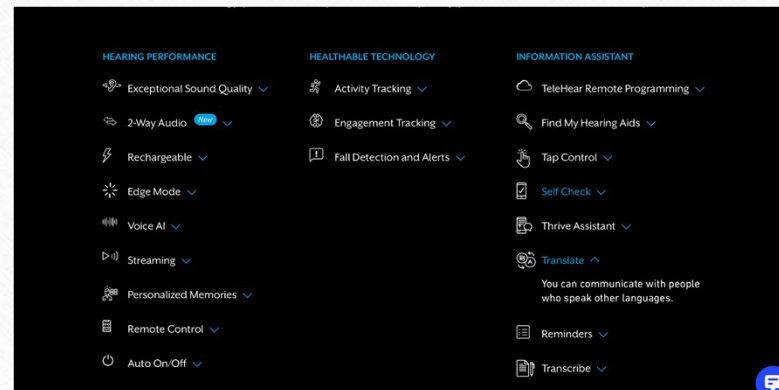
- Smart glove translates braille to speech in real-time
- Still conducting research trials
- Goal to launch user-ready model in December 2023
- <https://www.oramaai.com/s-projects-basic>





# Evolv AI Hearing Aids

- AI-driven technology that offers many enhanced features
- 40 % more Noise reduction
- [www.starkey.com](http://www.starkey.com)



# HP Hearing PRO

Self-fitting, over-the-counter hearing aids with Bluetooth®

- Pre-order; \$700
- FDA-cleared and calibrate to a person's hearing loss via the HP Hearing app.
- Clinically proven to improve speech understanding in noisy environments looks like mainstream earbuds vs hearing aids.
- Rechargeable case included



# Dot Pad

- Smart tactile graphics display for the visually impaired.
- Can display any visual content from any source because the innovative Dot Image Processing technology uses AI to analyze and understand visual input and present it most accurately on Dot Pad's tactile display of 2,400 dots
- <https://pad.dotincorp.com/>



# Self-dispensing refillable toothbrush by Nest Care

- Silicone brush w/ UV sterilization technology and self-dispenses toothpaste with a touch of a button
- \$110



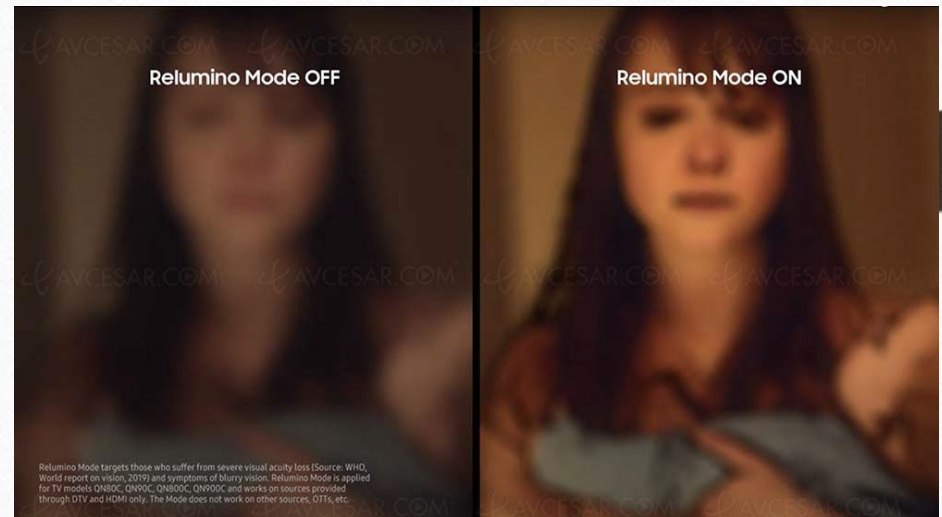
# Lux Lab E-Digestion

- Lux Lab and Hayang University Erica
- A digital system that monitors and manages digestive disorders for those with mobility issues or who cannot rely on physical exercise. E-Digestion consists of a controller with an intestinal health sensor and a digestive therapy mat that stimulates digestive muscles in real time with electro-physical stimulation.
- The controller analyses the user's intestinal health with micro-vibration sensors placed on the abdomen. Then, a deep-learning algorithm analyses digestive health and provides user-customized specific vibration patterns that promote digestion.



# Samsung RELUMINO Mode FOR TELEVISIONS

- With the click of a remote, Relumino Mode for televisions uses Samsung-developed artificial intelligence to dynamically outline the edges of on-screen elements and rebalance colors, enabling virtually anyone to better see people, objects, and text.



# HAPTA (L'OREAL)

- CES 2023 Lancome Innovation
- Magnetic Lipstick attachment with built-in smart motion controls and customizable attachments gives the user an improved range of motion



# Questions for Tomorrow

## Is This for the Good of Humankind????

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- NFT's (non-fungible tokens) - digital assets built on blockchain technology - i.e. digital artwork, digital concert tickets, etc
- Block Chain Technology – A new group of shared, unchangeable technologies that helps safely store digital ownership of assets
- Life in the Metaverse – Some spend most of their day in the digital world
- ChatGPT (Generative Pre-trained Transformer) - Completes highly accurate levels of written language using AI
- In 2023 look for BIG advances in Virtual Reality, 5G, and Block Chain Security Technology





# Washington Assistive Technology Act Program

## WATAP

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(800) 214-8731 Toll-Free Hotline  
(206) 685-4181 V (206) 616-1396 TTY  
(206) 543-4779 Fax

<http://watap.org/>

<http://uwctds.washington.edu/>

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