

Access and Explore! Using Environmental Control in Transition

Ben Jacobs & Liz Persaud
Tools for Life
AMAC Accessibility Solutions and Research Center
Georgia Tech

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www.amacusg.org

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Session Description



- The move from classroom to “real life” can be a major transition. Students go from being surrounded by their teachers, peers and helpers regularly, to being by themselves more often and needing to learn strategies for independence.
- Creating an environment in the classroom that enables learning independence can help ease the transition process into postsecondary education or community living.
- In this session, presenters will ask the “critical questions” that you need to know when assessing your clients and share success stories of individuals using a variety of environmental controls.
- This session will also include a demonstration of affordable environmental control solutions that can be implemented in the classroom and then used throughout the transition process. Multiple environmental control options and options for interacting with the environment (voice, computer, tablet, phone and robotics) will be covered.



Objectives



At the end of this session, participants (you) will be able to:

1. List 3 environmental control protocols and their effectiveness.
2. Assess and implement solutions for students to interact with their environment.
3. Identify 3 affordable solutions to implement in the classroom.

For Handouts: <http://www.gatfl.gatech.edu/tflwiki>



Our Goal Today



- ✓ Share information about various environmental controls.
- ✓ Give examples/scenarios of using environmental control in the classroom.
- ✓ Explore how getting accustomed to using environmental control in the classroom can help students throughout the transition process and to postsecondary education, community living, and the workplace.



Tools for Life Mission



We're here to help Georgians with disabilities gain access to and acquisition of assistive technology devices and assistive technology services so they can live, learn, work, and play independently in the communities of their choice.




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CUSTOMIZED AT TRAINING
for Individuals or Groups



Welcome to Tools for Life

Tools for Life, Georgia's Assistive Technology Act Program, is dedicated to increasing access to and acquisition of assistive technology (AT) devices and services for Georgians of all ages and disabilities so they can live, learn, work and play independently and with greater freedom in communities of their choice.

Tools for Life and the TFL Network work collaboratively together to accomplish

2015 IDEAS CONFERENCE

**JUN
1**

Epworth by the Sea, St. Simons Island

2015 GATE SEMINAR

**DEC
4**

Georgia Tech Student Center

WEBINARS

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TOOLS FOR LIFE APPFINDER



...for Living, Learning, Working, and Playing.

AT ONLINE EXCHANGE



AT FUNDING GUIDE

DOLLARS & SENSE

NAVIGATING THE AT FUNDING STREAM

TFL AppFinder



Search by:

✓ **App Name**

✓ **Categories**

- Book
- Education
- Environmental Adaptations
- Hearing
- Cognition, Learning, Developmental
- Navigation
- Personal Care and Safety
- Productivity
- Communication
- Therapeutic Aids
- Vision



What is Environmental Control?

Defining Environmental Control



- An environmental control device is a form of electronic assistive technology which enables people with significant disabilities to independently access equipment in their environment e.g. home, classroom and/or office.
- An environmental control controller is the device that controls the equipment – like a remote control. The controller is used to select a range of different options. Each option will control a piece of equipment in a certain way – for example: volume on a TV.

Who needs Environmental Control?



- Anyone with complete loss or minimal ability to control devices in their immediate environment (such as the television, computer, phones, lights, doors, etc.).
- Technology that allows a people with disabilities to gain this type of control has been called an environmental control system and/or units (ECS, ECU).




Types of Environmental Control



1. **Switch** - the user activates an accessible switch to control the environmental control unit, generally done through menu scanning.
 2. **Voice** - the user speaks the commands to the environmental control unit
" turn on bedroom light."
 3. **Both**
- ✓ The more options available (switch, voice, and/or both) the more independence can be gained.
 - ✓ **Tip!** Look for the ability to customize or combine the control (input) devices to meet needs. While a voice-activated system can give the most independence, one's voice can become weak by the end of the day, so an ECU that can be controlled by both voice and switch may be very beneficial.





Critical Questions for Environmental Control

Critical Questions #1



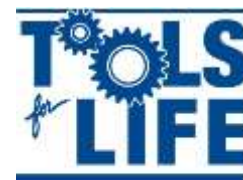
- What do you want to control?
 - ☐ Computer
 - ☐ Game
 - ☐ TV
 - ☐ Lights
 - ☐ Appliances
 - ☐ Chair
 - ☐ Door
 - ☐ Smartphone



Critical Questions #2



- What access can be automated?
 - Timers
 - Schedules
 - Scenes



Critical Questions #3



- Could the environmental control unit (ECU) be mounted?
- If so, where?
 - ☐ Wheelchair
 - ☐ Table
 - ☐ Desk
 - ☐ Countertop



Critical Questions #4



- How will the ECU be accessed/controlled?
 - ☐ Direct
 - ☐ External
 - ☐ Switch(es)
 - ☐ Scanning
 - ☐ Voice



Critical Questions #5



- Are there any cognitive issues affecting number of choices, memory, etc.?



Critical Questions #6



- Will physical and cognitive abilities be changing over time?
 - Traumatic Brain Injury
 - Neurodegenerative Processes



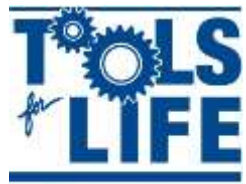


A Closer Look at Environmental Control Solutions

Castle OS and Castle Hub



- Chris Ciccitelli has been a fan of Star Trek and was fascinated by the idea of a computer listening to you and taking any action requested. Sometimes it was just retrieving information, other times it controlled different ship functions.
- Chris worked for years creating a system for home automation/control that emulated the computer on Star Trek.
- Castle OS and Castle Hub are able to control all other EC devices regardless of what protocol it uses.
- This system operates using the microphone array in the Kinect camera to listen to you from anywhere in the room.



Amazon Echo

amazon echo

Always ready, connected, and fast. Just ask.



- Speech-controlled speaker system
- Voice recognition - further distances
- All functions are server side
- Compatible with many EC Brands
- \$179.99

Xbox One with Kinect



- Control your entertainment with your voice
- Netflix, Skype, Youtube, Internet Browser, Music, Television, etc.
- Gesture Control
- Price varies depending on bundle.
- Xbox One ~ \$350
- Kinect ~ \$100

Vera and Veralite

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VeraLite

Smart Home Controller

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[Description](#)[Features & Specs](#)[Warranty & Support](#)

YOUR NEW ASSISTANT

HOME CONTROL DOESN'T HAVE TO BE COMPLICATED OR EXPENSIVE, SO WE CAME UP WITH THE VERALITE SMART CONTROLLER, WHICH IS SIMPLE AND INEXPENSIVE. IT MAY BE SMALL, BUT IT'S CAPABLE OF BIG THINGS!

- Easily manages up to 70 devices
- Plug and play with your Internet connection
- Controls over 750 smart products of all kinds
- Custom text and email alerts for any situation



VeraLite gives you easy control over lights, cameras, thermostats, door locks, alarm systems and more. Plus you easily can add intelligence to almost anything electronic in your home, and VeraLite can control them too. All the smart home benefits you've been looking for are right here in this easy, inexpensive add-on to your home network.



AN AMAZING AMOUNT OF SMART
TECHNOLOGY THAT FITS IN THE
PALM OF YOUR HAND.

VeraLite gives you easy control over
lights, cameras, thermostats, door locks,
alarm systems and more.

ONLY \$179.95

WHAT'S IN THE BOX



Vera User Interfaces

Vera gateways can be controlled with a number of different interfaces.

- First Party Software
 - PC
 - MAC
 - Smartphone App
- Third Party Software
 - Smartphone Apps
 - TASKER! (Android only)



Tasker



Tasker is a phone automation application that allows you to really unleash your android device's capabilities.

Tasker in a nutshell is a program that tells your device “When this happens, do this!”

- “When something is plugged into the headphone jack, open my music app”
- “When I open the navigation app, turn GPS on”
- “When my phone is connected to this cell tower, turn on wifi and connect to my home wifi”

More on Tasker



Plugins for Tasker allow you to access other features of your phone and interface with other internet connected devices.

- Autovoice – Allows you to set up custom voice commands and turn always listening on
- Autocast – Enables you to control a Chromecast device on your TV
- Autovera – Interfaces with your Vera gateway



TFL Environmental Control Lab



Georgia's Assistive
Technology Act Program

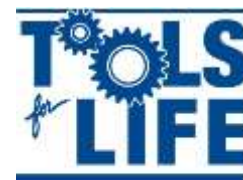


A Closer Look at Environmental Control Access Solutions

Fact!



If you can control your computer, you
can control your environment!



Georgia's Assistive
Technology Act Program

Mobile Devices & Mounting



- Explore various mounting options to hold mobile devices
- Helps with posture
- Operate wheelchair or other mobility aid safely
- Builds confidence
- Now I can text Ben all the time!

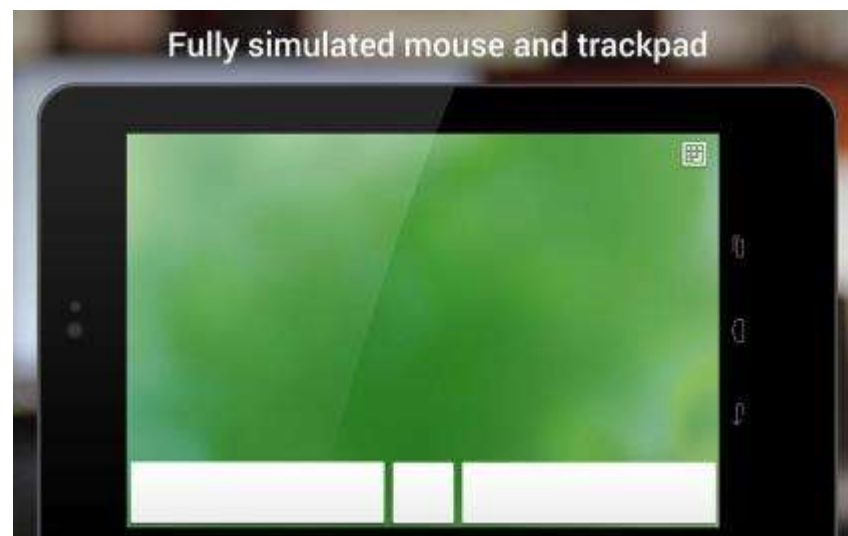
Touchmouse

- By Logitech turns your iPhone or iPod touch into a wireless trackpad and keyboard for your computer
- Works over Wi-Fi
- Need to download the Touch Mouse Server software



Remote Mouse

- Turns your mobile phone or tablet into a wireless remote control for your computer
- Fully simulated mouse
- Magic trackpad
- Multi touch Gestures
- Landscape mode



Adaptive Switch Laboratories (ASL)



125 Spur 191, Suite C, Spicewood, TX 78669
Toll Free: (800) 626-8698 · Local: (830) 798-0005 · Fax: (830) 798-6221

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Products / New Products

ASL brings innovative products to our clients! We are here to help each client reach their full potential – our team creates products and designs as a direct result of the needs of those we serve. Our goal has always been independence and equal rights for those we work with....

Driver Control Packages

104 Electronic Head Array



100 Series

Driver Control Packages

ASL 138 Extremity Control Joystick



100 Series

Electronic Switches

ASL 215 Round Proximity Sensor with Mono Port and 24 Volt Connector



200 Series

Electronic Switches

ASL 215 Round Proximity Sensor 2 Din

Specialty Products & Adaptors

ASL 138 Extremity Control Joystick

Specialty Products & Adaptors

ASL 215 Round Proximity Sensor

Button Switch

- The ASL 305 Button Switch is a momentary switch.
- Activation button the size of a dime
- Requires medium force for activation.
- Enables easy access to multiple wheelchair functions (tilt, recline, power legs, elevate, etc.)



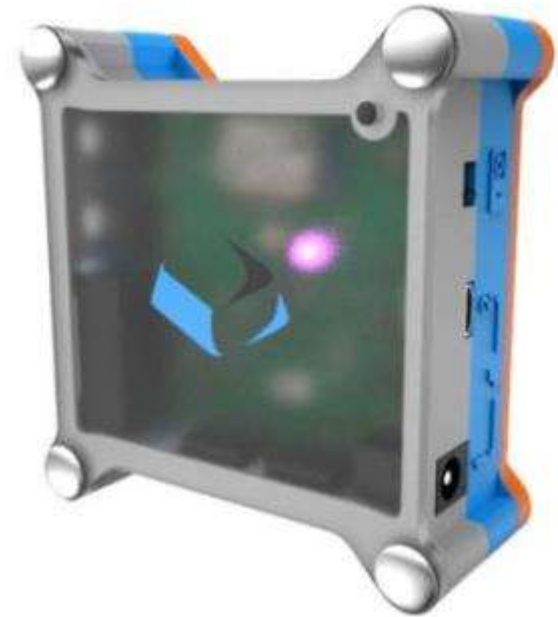
Ultra Light Switch



- The ASL 314 Ultra Light Switch has a very light activation force and low profile.
- Ideal for people with limited movement or weakness.
- Attach with a reusable sticky base or 2 screw mounting holes for secure placement.

Tecla Shield

- Wireless device that controls smartphones and tablets using your external switches or the driver controls of your power wheelchair
- The only switch interface that works with both iOS® and Android mobile devices.



Prestorian APplicator



- Inclusive TLC
- Bluetooth
- Access switch accessible apps
- Up to 4 switches
- Paired to iPad/ iTouch/ iPhone
- 64 ft operating range
- Programmable functions

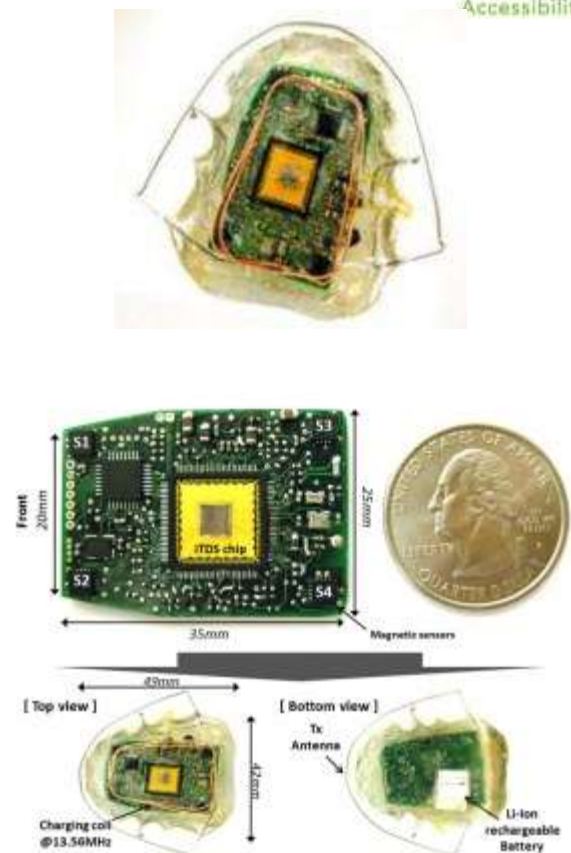
Joystick to Mouse Emulator

- Allows any joystick to point & click just like a mouse.
- Joystick can position the mouse cursor and enables the joystick buttons to operate as mouse buttons.
- Provides computer access and control via joystick to do with limited mobility.



Tongue Drive System

- Wireless device that enables people with high-level spinal cord injuries to operate a computer and maneuver an electrically powered wheelchair simply by moving their tongues
- dental retainer embedded with sensors
- detect movement of a tiny magnet attached to the tongue
- Testing with iPods and iPhones




GT Tongue Drive System

Georgia Tech

da Vinci

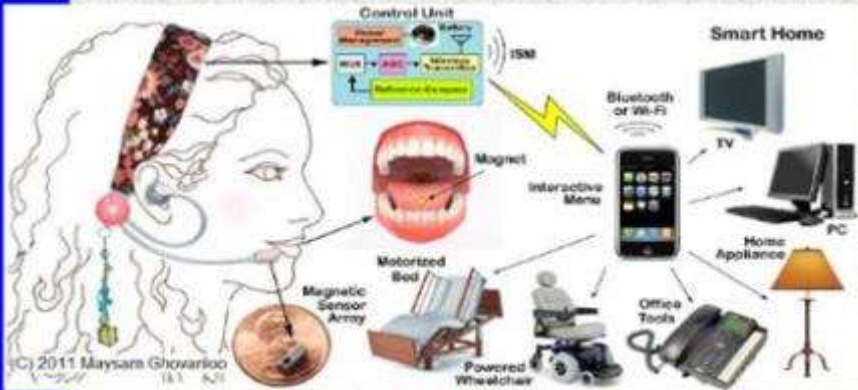
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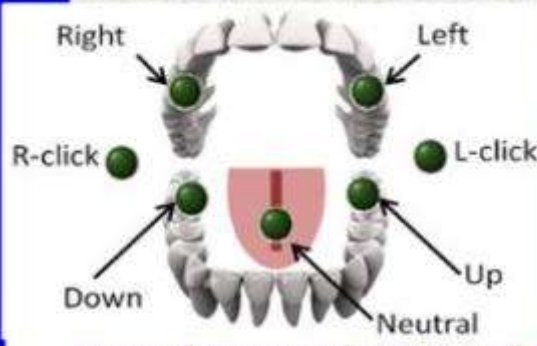
2010 FINALIST

School of Electrical and Computer Engineering

**Tongue Drive System (TDS):
A Brain-Tongue-Computer Interface**



© 2011 Maysam Ghovanloo



Intraoral Tongue Drive System (iTDS) Technical info

Clinical Trial Completed

If you have tetraplegia, live in Atlanta, GA or Chicago, IL, and interested in participating in the upcoming clinical trials, please do contact Dr. Ghovanloo.

Eyegaze Edge

- Control computer and tablet using your eyes
- Environmental Controls
- Communication



TOBII Eye Mobile

- Hands free access to Windows 8 Tablets
- Navigate, communicate, play using your eyes
- Supports Switch and Touch Inputs
- Small and Lightweight



VGo Telepresence Robot



- Enables a person to replicate themselves in a distant location and have the freedom to move around as if they were physically there.
- Reduces travel costs
- School
- Hospital
- Work Remotely



Solutions

- Overview
- Products and Services
- Benefits
- Applications
 - Healthcare
 - Large Enterprise
 - Manufacturing
 - Education
 - SMB

Quick Links

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People with Disabilities in the Work Place

Sector: **Business**



VGo increases productivity and effectiveness while lowering costs by enabling a person to get to a location instantly and easily. VGo is not designed as a replacement for in-person interaction but rather as the next best alternative to "being" in the workplace. VGo also eliminates the deficiencies associated with other video solutions that are locked to a TV or computer monitor by providing 100% remote controlled mobility. [delete that](#)

In addition to "being" at work from home, VGo can help people who can get to the workplace, but who cannot practically move about the facility or campus. A VGo can be used to enable a person to move around in one part of the facility while they are physically in another.

The benefits of using VGo in the workplace include

- Getting to places previously inaccessible increases opportunities
- Freedom of movement increases personal interaction with others
- Quality of life improvements by expanding the work and social environments
- Costs can be reduced by lowering or eliminating select transportation expenses, and by communications and speeding decision making



Heated Mouse



- Warms hands
- Good for someone with arthritis or MS
- High/low/off for heat
- Low voltage; safe for computer use

DXT Fingertip - Vertical Wireless Mouse



- Ergonomic Relaxed Neutral Wrist and Hand Position
- Precision Grip for Accurate Navigation
 - Small muscles and joints of the fingers have higher processing abilities
- Instantly Switches Between Right and Left Hand



Contour Roller Mouse

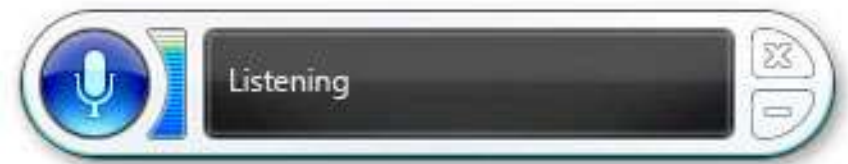
- Ergonomic alternative to the traditional mouse that sits directly in front of your keyboard
- Does not require your back, neck, and shoulders to be involved in mouse work
- Grip-less
- Built-in wrist supports
- Placed in the middle of the recommended work zone, eliminating long and repetitive reaching movements



Microsoft Speech Recognition



- Dictate and edit
 - dictate words into word-processing programs or to fill out online forms in a web browser
- Control computer
 - run programs and interact with Windows
- Built-in
- Train computer to voice
- Need microphone



Dragon NaturallySpeaking



- Speech recognition software
- Control your computer with your voice
- Works fast, 99% accuracy
- Dictate documents
- Search the web
- Precise and quick training

Resources



- http://en.wikipedia.org/wiki/Environmental_control_device
- <http://www.ncbi.nlm.nih.gov/pubmed/15614204>
- http://www.etoengineering.com/environmental_control_unit.htm
- <http://getvera.com/controllers/veralite/>



Questions



Our question to you:
What have you learned today?

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Disclaimer

This presentation is produced by Tools for Life which is a result of the Assistive Technology Act of 1998, as amended in 2004. It is a program of the Georgia Institute of Technology, College of Architecture, AMAC Accessibility Solutions and Research Center and was made possible by Grant Number H224C030009 from the Administration for Community Living. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of HHS.





**Thirsty for More?
Additional
Solutions and
Information**

Mealtime Partner Feeder

- Variety of mounts
- Battery operated
- Control amount of food
- Control pause time between spoonful
- Adjustability of the spoon



Bestic Feeder

- Bestic can best be described as a small, robotic arm with a spoon in the end that can easily be maneuvered.
- Bestic is small and compact, has an attractive, discreet design and is very quiet which makes it blend into the dining environment in a natural way.
- By choosing a suitable control device, the user can independently control the movement of the spoon on the plate and choose what and when to eat.



Switch-Adapted Digital Camera



- One switch to turn camera on/off
- Second switch for snapping the pic
- Start/stop video
- <http://rjcooper.com/digital-camera/>
- \$349; includes mounting arm



Logitech Harmony Remote

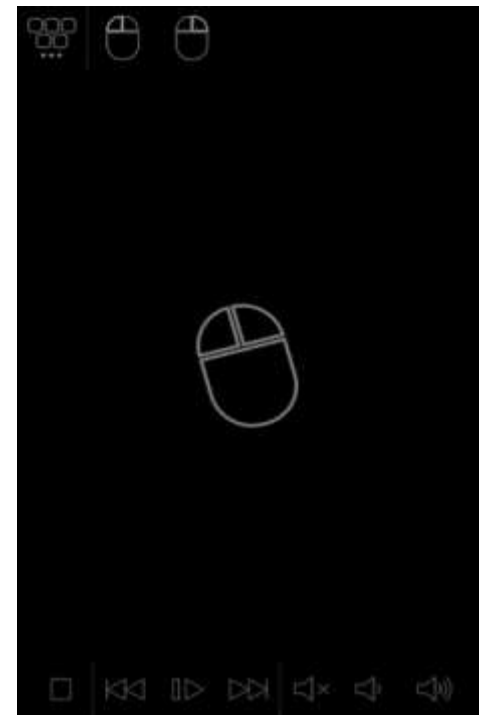
The Logitech Harmony Remote product line has recently added a hub and an app for your mobile device that allow you to control your entertainment devices.

Multiple tasks, such as turning on the TV, switching it to the appropriate source, turning on the cable box and the audio receiver can be programmed into a single button.



Touchpad

- Touchpad is an Android app that makes your mobile device a new way to control your Windows PC.
- Users can use their device as a replacement for the mouse.
- The app includes multi-touch gestures making it easy to emulate dragging and dropping on the touch screen.



Xpadder

- Xpadder is a free program for Windows that allows you to configure the inputs on most videogame controller any way that you like.
- You can have media controls assigned to different buttons so you can easily pause or control volume.
- The mouse as well as the keyboard are easily emulated on the controller as well.



MOGAnywhere

- Enables you to play video games on your Apple or Android phone.
- Great for gamers with limited mobility
- \$29.99 to \$99.99



Playstation 4 Media Console



- The PS4 isn't just a gaming console. It is a multimedia center.
 - Apps
 - Internet Browser
 - Social Network
 - Voice Control
 - Controller Input vs Keyboard and Mouse



Playstation 4



- Sony recently updated their firmware for the Playstation 4 **media** console. This update included many new accessibility features appearing on a device of this kind for the first time ever.
 - Remap Inputs
 - Magnification
 - Font Customization
 - Color/Contrast control/inversion



Kubi



- Dock your tablet for remote pan and tilt controls
- See and interact with people during a conference call
- Use any Video Client: Skype, FaceTime, Google Hangout, etc.
- Cloud Control

Building Access



- It's important to not only think of environmental control as a short distance radius around you, but as your true environment/surroundings.
- Building and infrastructure access is equally as important. Getting inside the building is one of the initial steps to controlling your environment!
- Example: in 1997 Georgia State University teamed up with Georgia Tech to create an innovative environmental control system that was easily accessed with a small remote and minimal movement. This enabled me to exit the MARTA bus, access the elevator up to the student common area, access the post office, access to student community center, open my building door, access the elevator up to my floor, open my apartment door, and lock it behind me. I hear that students are still accessing and using this technology successfully today!

- Video Demo



Samsung Gear Live



- One of the first generation of Android Wear Watches.
- Android Wear is a version of Android made specifically for wearable technology
- Android Wear allows you to access all the same capabilities your phone provides, conveniently located on your wrist.
 - Voice Recognition
 - Notifications
 - Fitness and health monitors



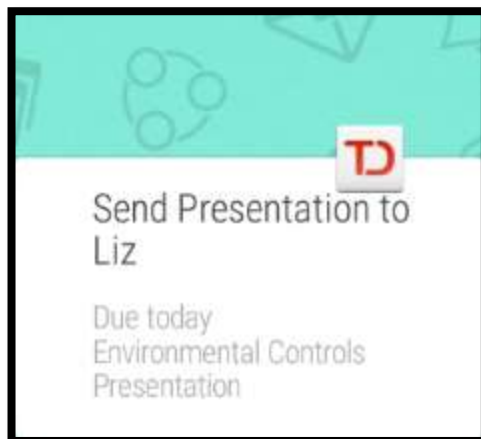
Moto 360 by Motorola

- Runs Android Wear, Google's operating system for smartwatches.



Moto 360 Classroom Apps

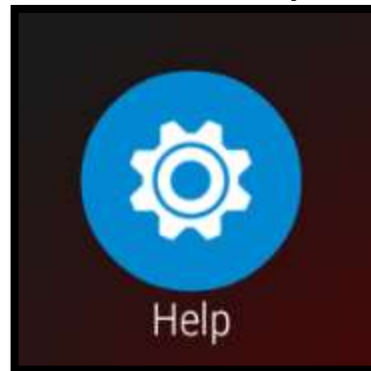
- Classroom Applications:
 - Todoist for Android Wear allows me to quickly view my homework assignments and check them off as I complete them.
 - Evernote for Android Wear allows me to study my notes on the go.



Moto 360 Transition Apps



- Transition Applications:
 - Tockle for Android Wear allows me to send preset text messages to my caretaker to let them know that I need assistance.
 - Through applications such as Wink and Hue Control for Android Wear, I can control certain aspects of my smart home appliances from my watch. However, these applications are not full solutions for controlling all of my smart home appliances from my watch.



Google Glass Update

- Wearable Technology
- Bluetooth Connection
- Navigate
- Make a Call
- Send a Message
- Take a Picture or Video
- Get the News
- Search
- Google Play Music
- Google Now
- Be Social
- Internal Compass
- ~~\$1500~~



The Future of this OS is Limitless



- Google has the futuristic ambition and the funds to take Android to unprecedented heights. In many areas — such as predicting what users will do next.
- Google Now knows that in the morning you're getting ready for work and will tell you about the traffic.




Google Now

Google now What is it How to get it Cards [Get it now](#)

Introducing Google Now

The right information at just the right time

From knowing the weather before you start your day, to planning the best route to avoid traffic, or even checking your favorite team's score while they're playing, Google Now brings you the information you want, when you need it.



Assistance around the clock

Preparation for the Future



Ready for the Workplace

All of the solutions, helpful tools and strategies that I learned over the years are helping me to be successful today!

Let your environment work for you!



Future

- Level out the playing field
- The Future is Contextual
 - GPS apps
 - Ads on Internet
 - Smart watches
 - Social Media

