

# Making AT:

Engaging HS STEM and Robotics Clubs to Create Custom AT Solutions

*Bill Binko (ATMakers.org)*

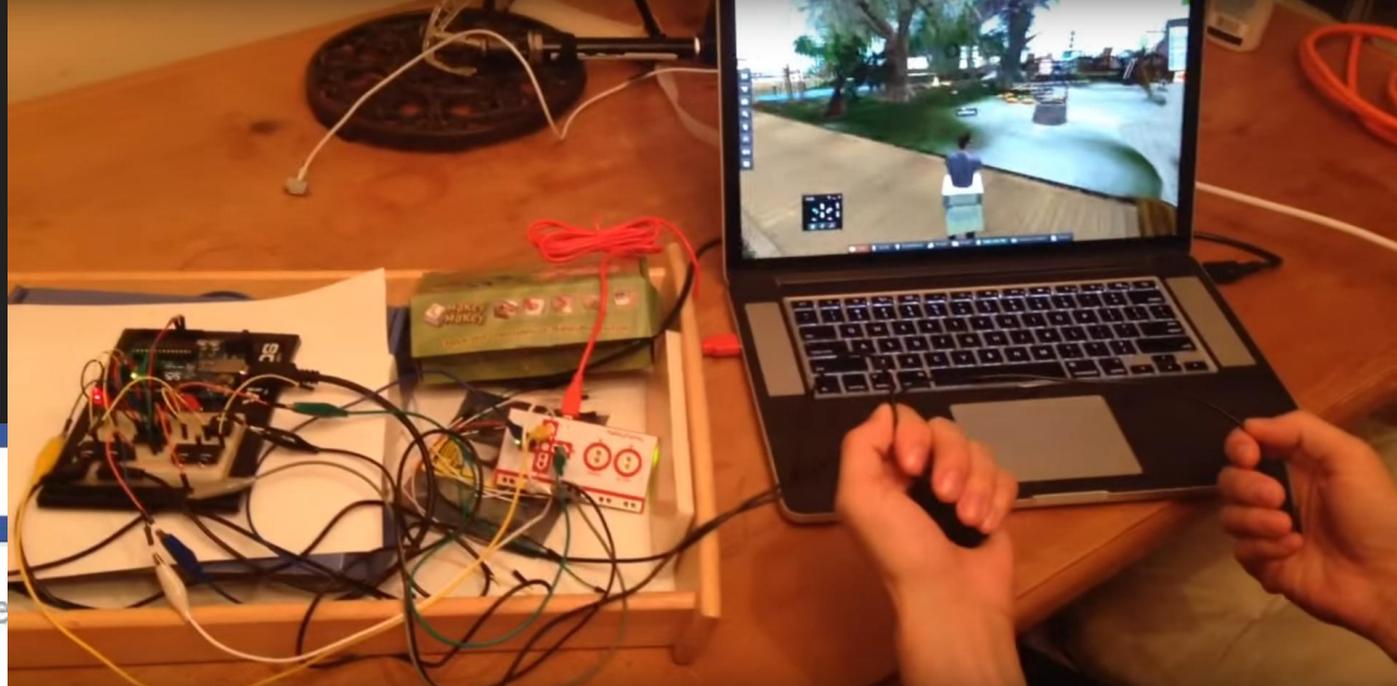
AAC In the Cloud – June 26, 2018

# Engineering Ella

Please watch the video directly here:

<https://www.youtube.com/watch?v=xNFvhjCJYb4>

Ella's mom, Erica, reached out on Facebook for help after her mobility company found no solution for her. And found Yahnatan (Max's Dad)



SMA Adaptability (Type 1 / SMARD focus)

## SMA Adaptability (Type 1 / SMARD focus)

Closed Group

Discussion

Yahnatan's post

Members

Events

Videos

Photos



Yahnatan Lasko shared

August 31, 2015

Work in progress: a prototype to test whether it is convenient to use two switches to control a powerchair (RIGHT to go right, LEFT to go left, BOTH to go forward).



### Two Switch Powerchair Control - prototype, video #1 (2015/08/30)

Max has spinal muscular atrophy (SMA) type 1, a life-threatening genetic disease affecting motor neurons. <http://www.maxstrength.org> Some parents in the SMA ...

YOUTUBE.COM



Like

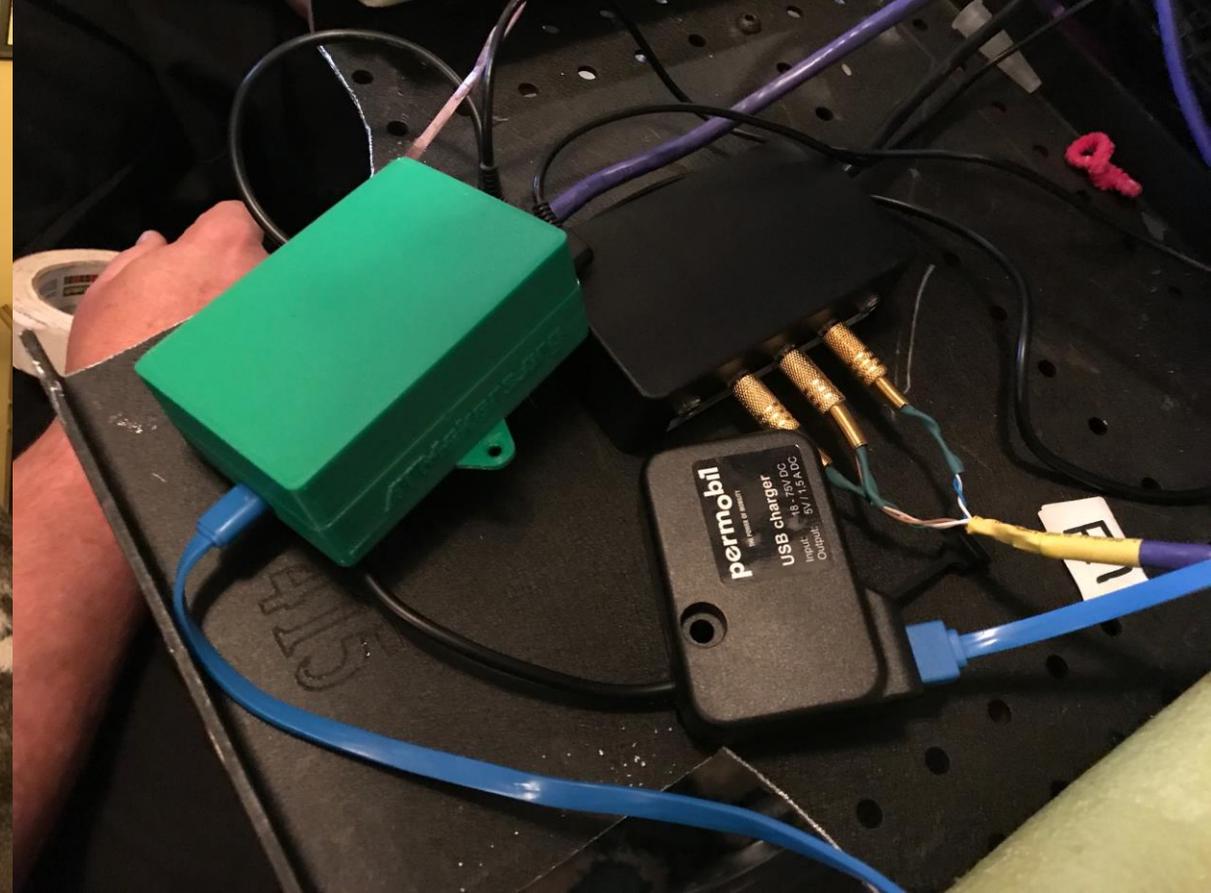
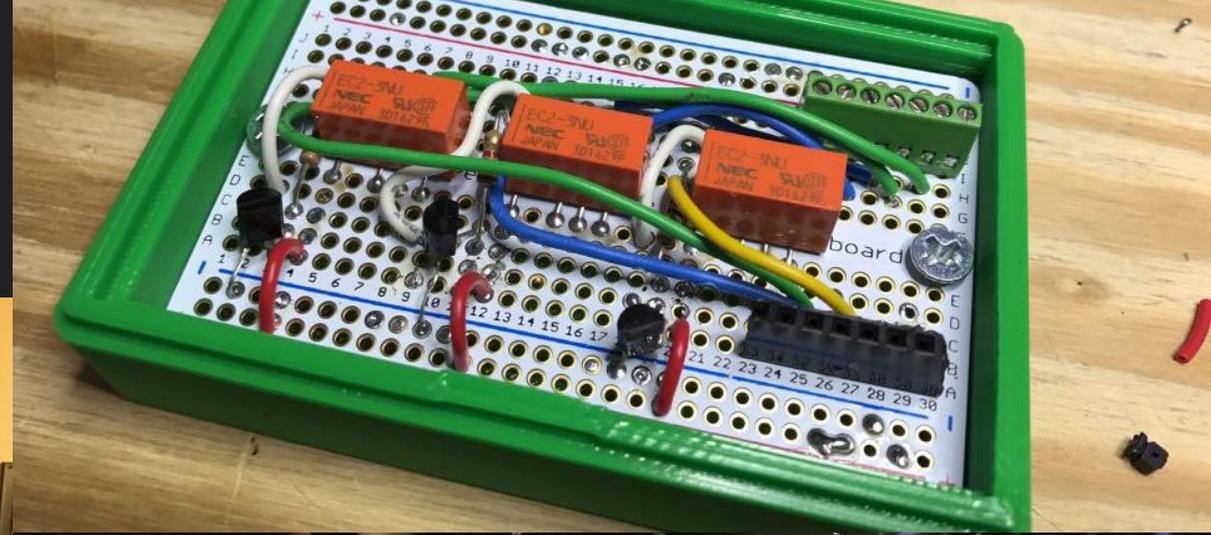


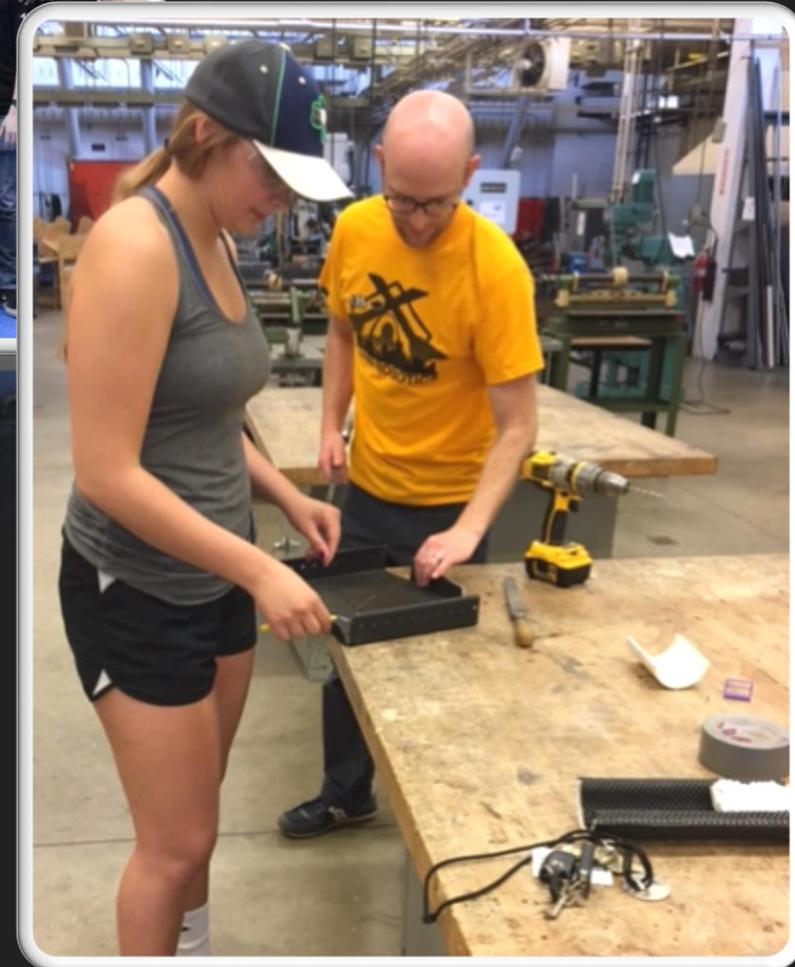
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ATMakers built a \$50 Adapter that allows Ella to control her chair with just two switches



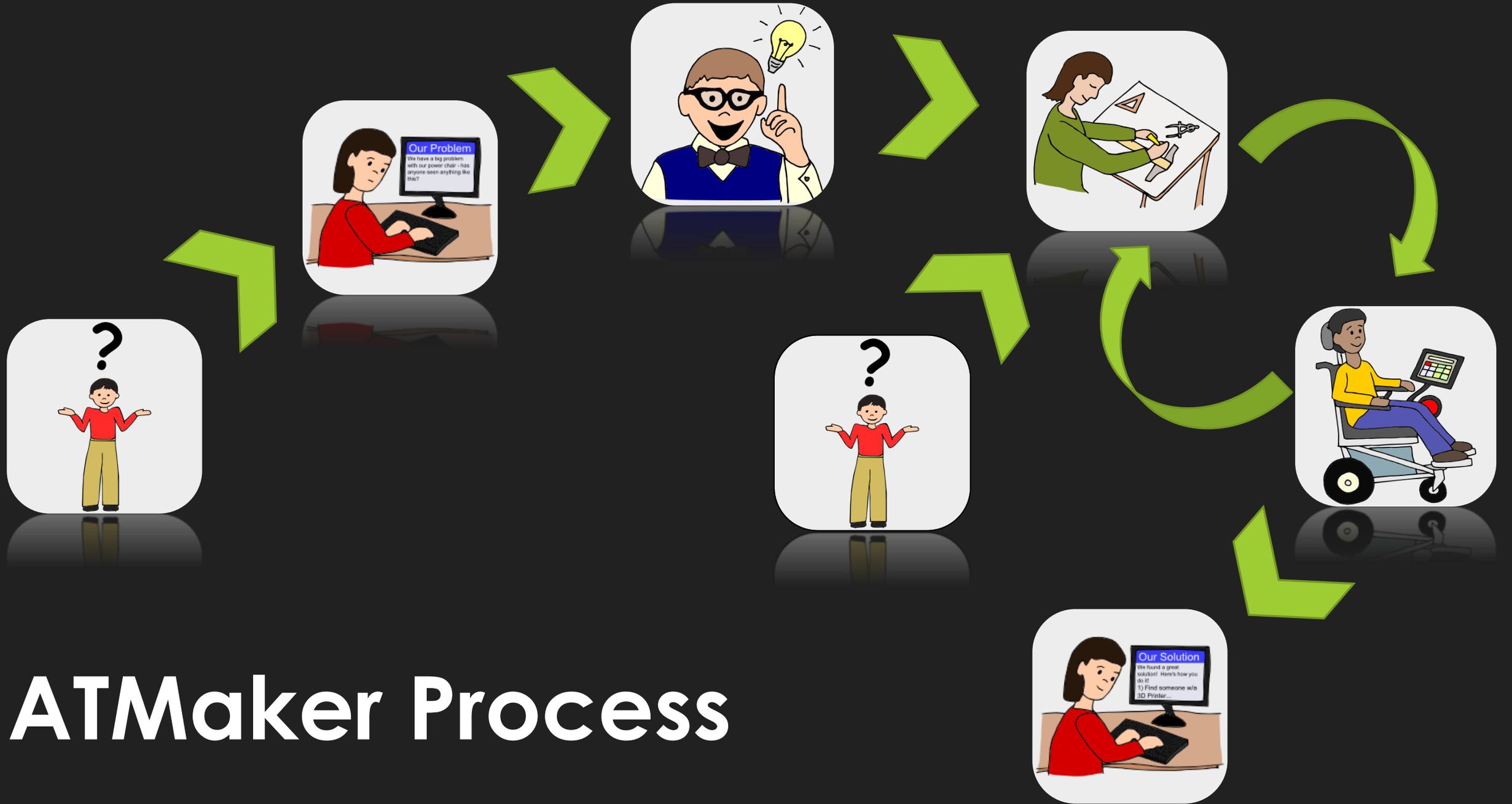


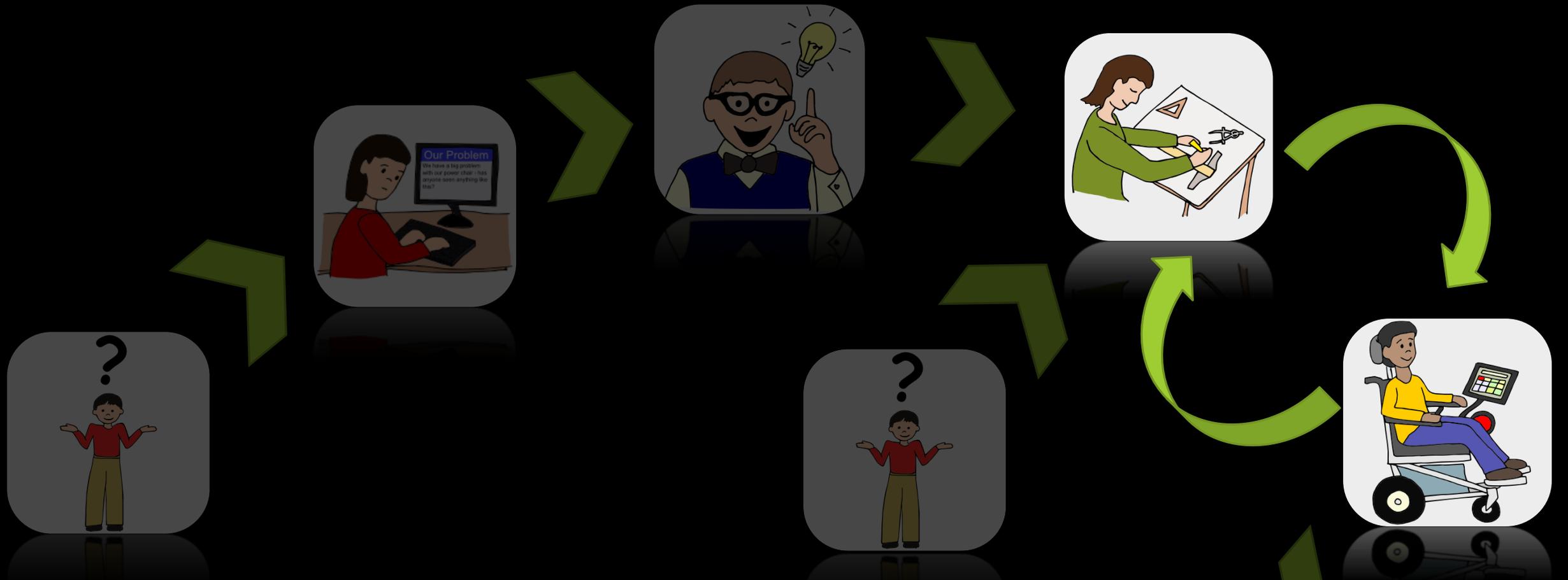
PENN

High School  
Mishawauka, IN



# ATMaker Process



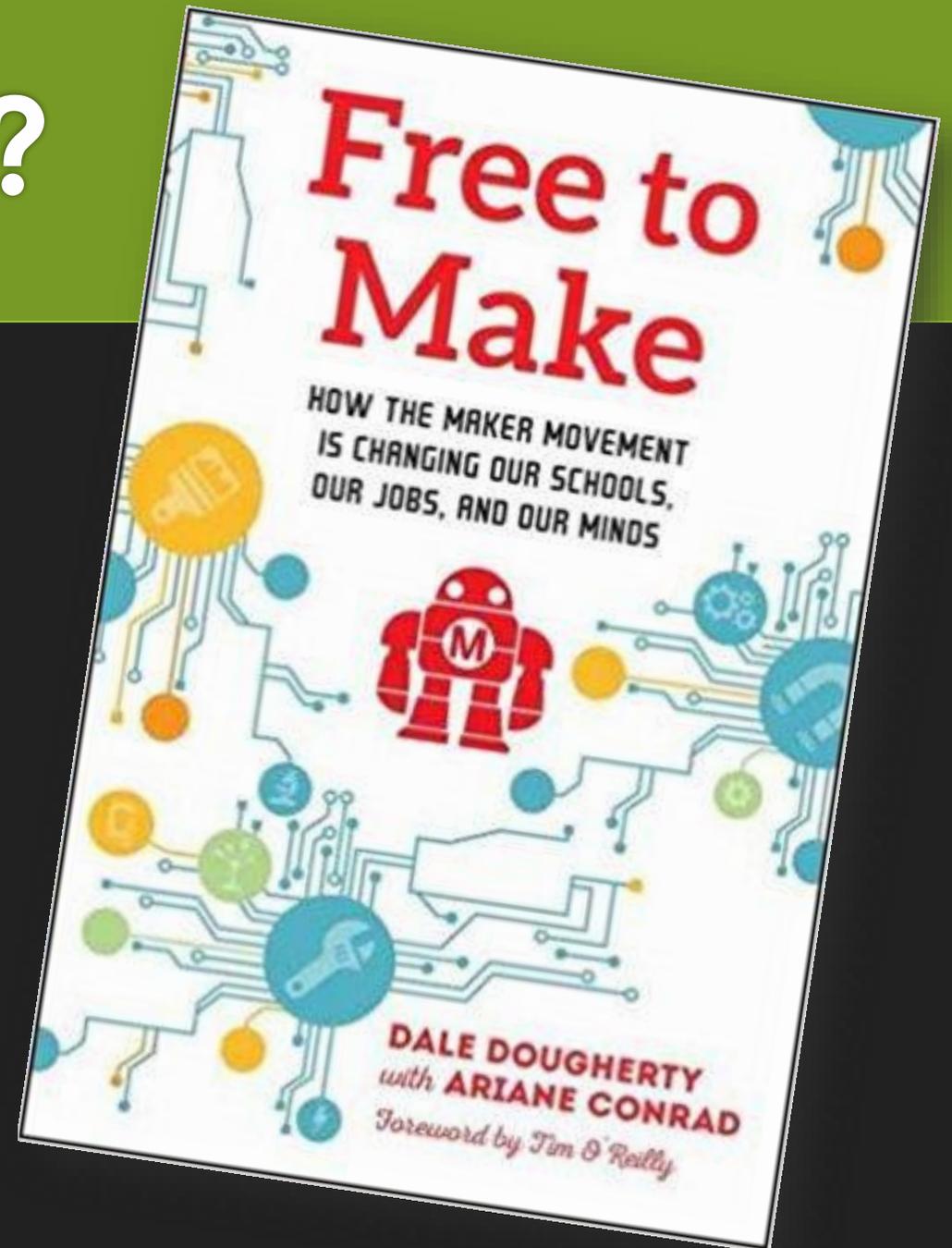


Where it Breaks Down:  
End Users Don't have  
Local Makers!

# What's a "Maker"?

## Maker Culture

- Anyone who makes what they want instead of buying it (ala Consumers)
- Artisans of all types: Not just electronics
  - 3D Printing, CNC Milling, Laser Cutting
  - Woodworking, Metalwork, Sculpting
  - Textiles, "Wearables", Art Installations
- Culture celebrates all types of invention
  - Gather in Cross-discipline "MakerSpaces"
  - Many Cross-over projects, Generalists Valued



# How can Makers Help?

- **Insane Arsenal of technology**
- **“One-off”/custom solutions**
  - The perfect switch for the user
- **Distributed near point of service**
  - Self-Aggregating
  - Easy to Find! (Hard to Manage!)
- **Self-Motivated & Self-Funded**
  - They do this for fun!
  - They **want** to help us!



CHAMPIONS OF CHANGE

[whitehouse.gov/champions](http://whitehouse.gov/champions)



Limor Fried [Adafruit.com](http://adafruit.com)

# Limor Fried on AT and the Maker Movement

Checkout Limor's talk with the MIT Students here:

<https://youtu.be/tZGeZV23t3s?t=21m51s>

# What does ATMakers Do

## Community of Makers

Dedicated to Assistive Technology

- Central Clearinghouse for AT Solutions
  - In-Progress on Facebook, Finished on [ATMakers.org](http://ATMakers.org)
  - Not just our designs (Makers Making Change, Go Baby Go, etc.)
- Come and Ask for Help!
- Referral Service to find your local Makers
  - Soft Introductions (we speak geek!)
- Engineering Support (for AT Orgs/Depts)





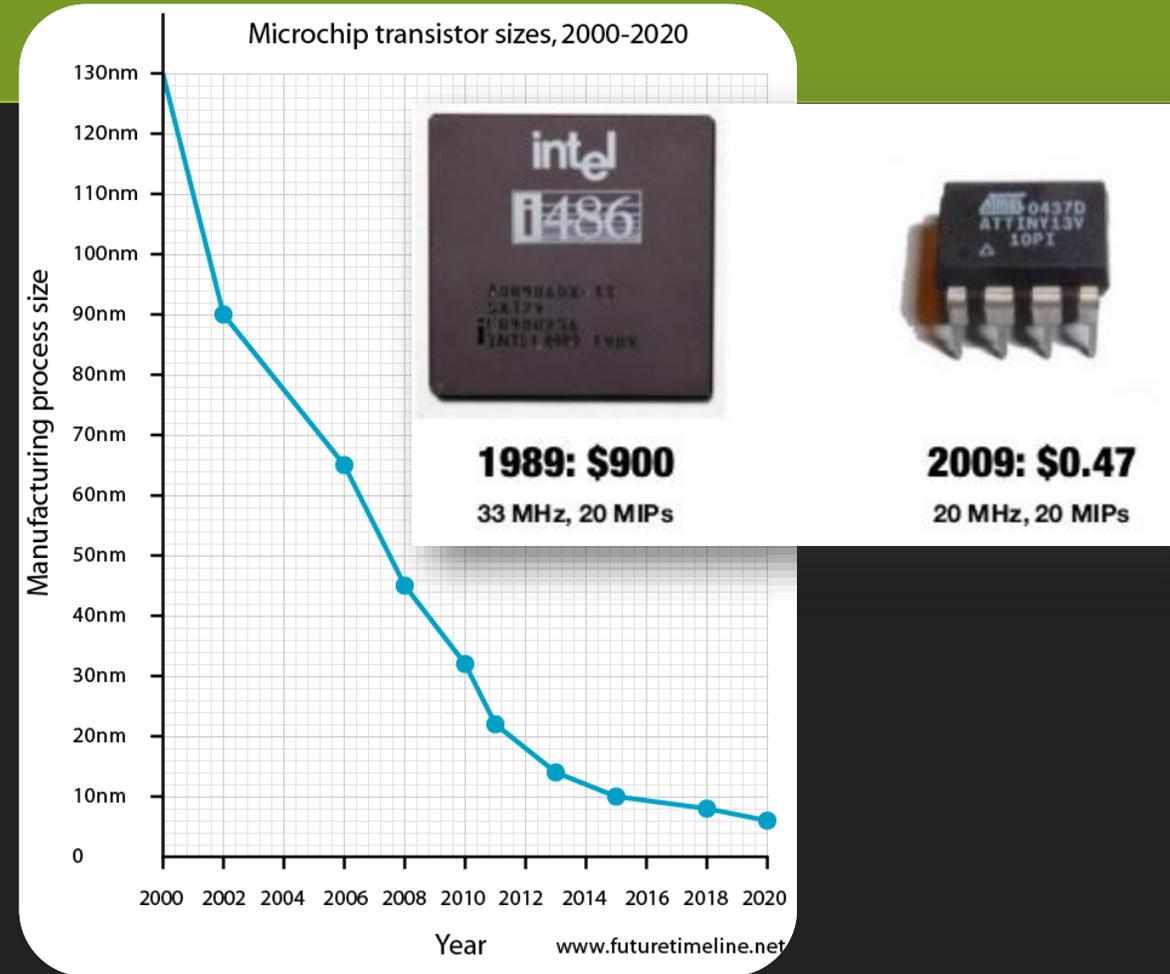
## The Last Straw: 'Sup Brows

\$35 EMG Switch used to text “Sup” to your friends.

*(NOT Used to allow children w/SMA Type 1 to control their environments)*

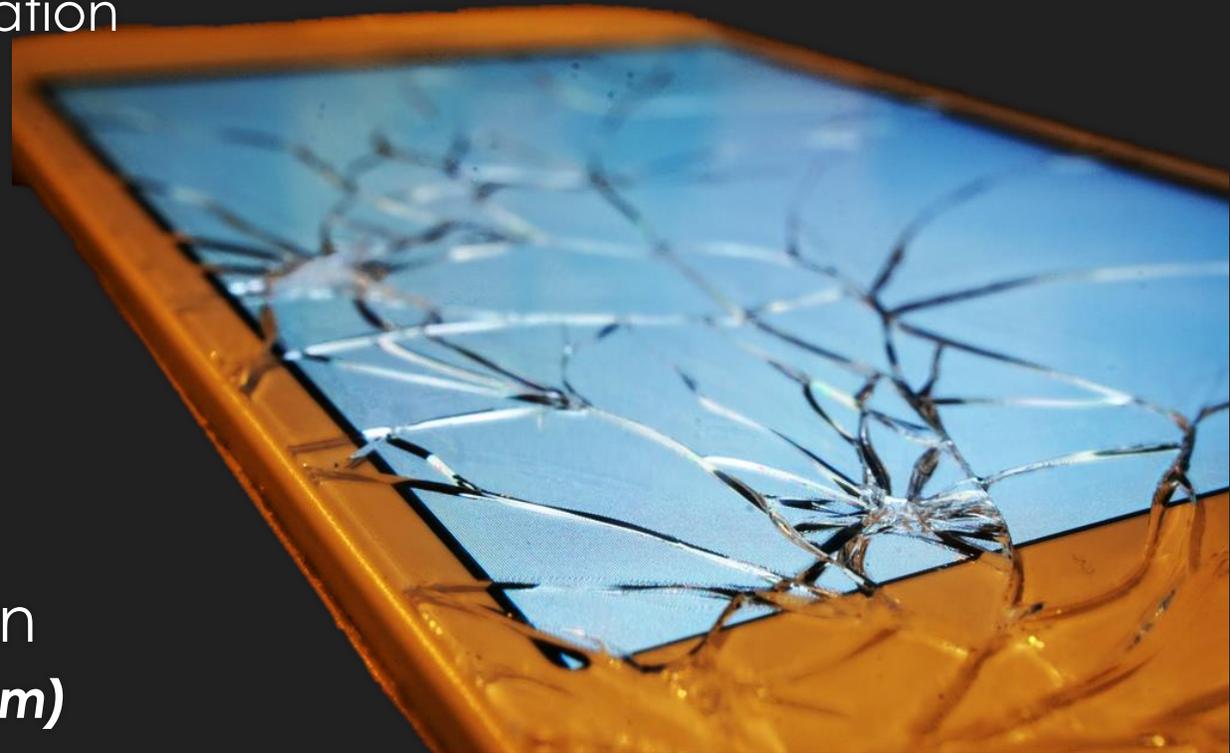
# (Funded) AT Is Broken

- Moore's Law Does Not Apply
- Since 2001, CPU Price/MIPS ↓99%
- Touch Screen Tablets now \$50-500
- CMS Prices for SGD in 2001 - \$7500
- CMS Prices for SGD in 2017 - \$7500
- Similar for Power Chairs, Switches, Accessories, etc.



# (Funded) AT Is Broken

- Good AT Vendors Behave Rationally
  - Compete on Outcomes, Support, Reputation
  - Not Features/Price/Availability
- Lengthy, arduous trials w/no options
- Only one Chair/SGD (for years)
- DME/Leasing Model
  - Can't modify/adapt devices
- Vendors spend huge % of revenue on "getting users funded" (*Lobbyist's Dream*)



# How do we Fix This?

*(I Have No Idea... But...)* Stop acting like this is “Normal”  
& Realize you have other options!!

# Engage your High School STEM/Robotics Clubs

1. Find a high quality team (look for lower “Team #”)
  - Search First Inspires Directory (FTC or FRC Teams)
2. Contact the coordinator or mentor and ask for help
  1. Have a specific project/recipient in mind
  2. Start with one of our kick-start projects (Toy Adapt, etc.)
3. Be conscious of their competition schedule
4. Ask for Help at [ATMakers.org](http://ATMakers.org) or the Facebook Group

# Compensating the Kids (yes, really!)

1. Everyone needs compensation – this is real work!
2. Teens value “making a difference” (now!)
3. Involve the teens with your clients directly
4. Allow them to show off their work (photo releases)
5. Provide validation & documentation of their efforts
  - They are applying for college/scholarships/Chairman Awards
6. Feed them & DO NOT take them for granted!



## Skills Needed:

- Basic Electrical Circuits
- Strip/Crimp Wires
- Simple Body Mods
- Switch Mounting



# 3D Printed Tactile Symbols (With RFID Tag Inside for ProxTalker/ProxPad)



# 3D Printed AT Switches



# Electronics Projects

- Wii Nunchuck Mouse
- Puck iOS Switch Control Button
- Capacitive Touch Switch
- Bluetooth EMG Switch



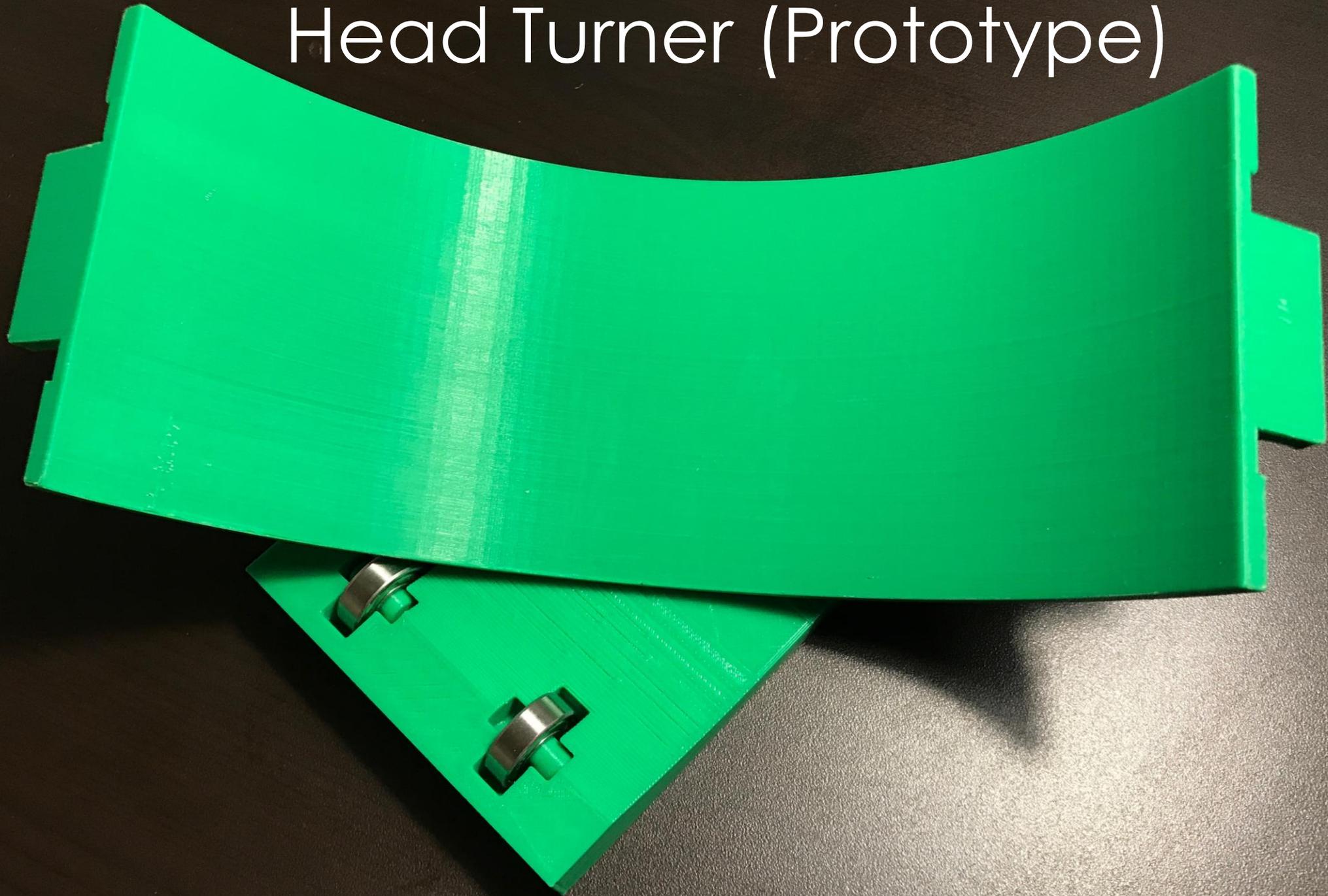
# Camera Mounts for AT Switches



# Device Mounts



# Head Turner (Prototype)



# How to Sell This To Your Students

1. Which sounds better on a college application:  
*“I made a drone that flies upside down”* **OR**  
*“I created a switch interface that allowed Joey to speak”*
2. These are Service Hours that are actually fun!
3. You can Automate your own House, too!
4. ***The AT Industry is ripe for disruption: you can get rich!***

# We need your help!

## We need adults and teens who can help us:

- Produce Guides & Videos
- Tune & Tweak our Wordpress Site
- Moderate the Facebook Group
- Chaperone teens at AT Conferences
- Connect with Influencers 😊

# Community & Support

- Facebook Group: [ATMakers.org Makers & Users](#)
- Central Repository: ATMakers.org
  - Glossary (Maker & AT Terminology)
  - Projects & Guides
  - Gallery of Success
- AT Industry Liaison
  - Supported by ATIA (Industry Association)
  - Members include employees at top AT firms  
*(LessonPix, Ablenet, Prentke Romich, ProxTalker, and More)*

Please...

1. Try the ATMaker Process At Least Once
2. If you work with or for an AT Vendor, share our guide "How to be a (More) Maker-Friendly AT Vendor"
3. Raise Your Expectations of AT – at least as high as your Consumer Technology.

