

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



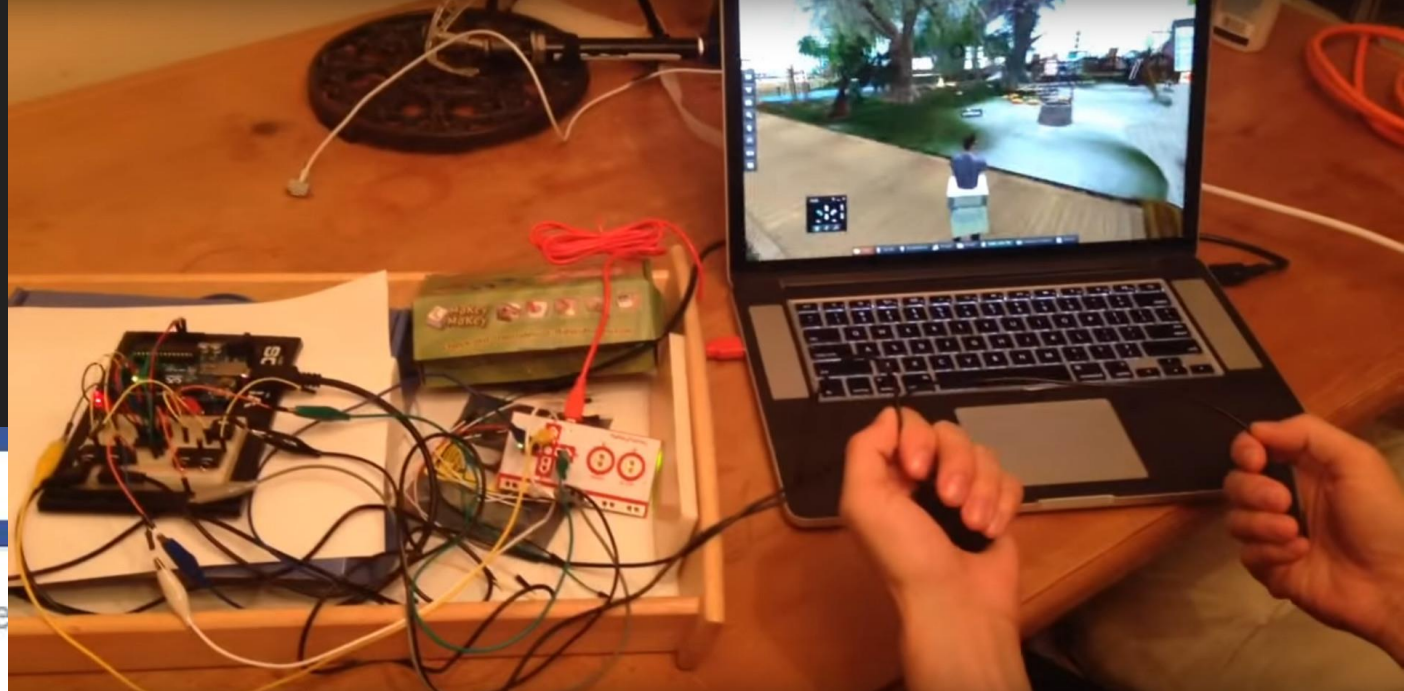
Like

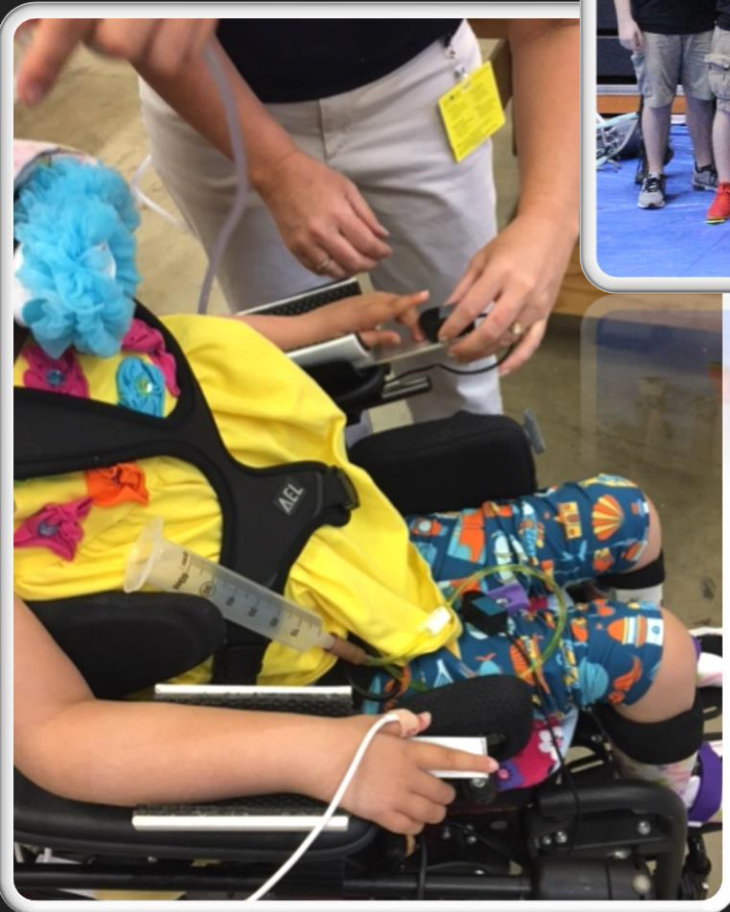


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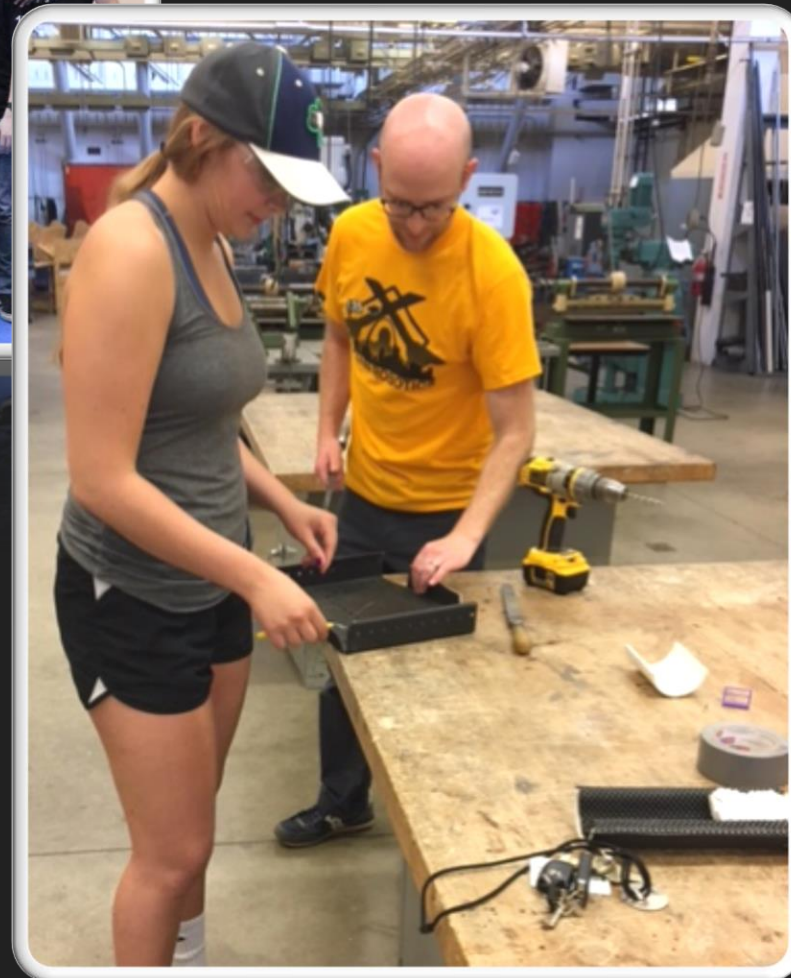


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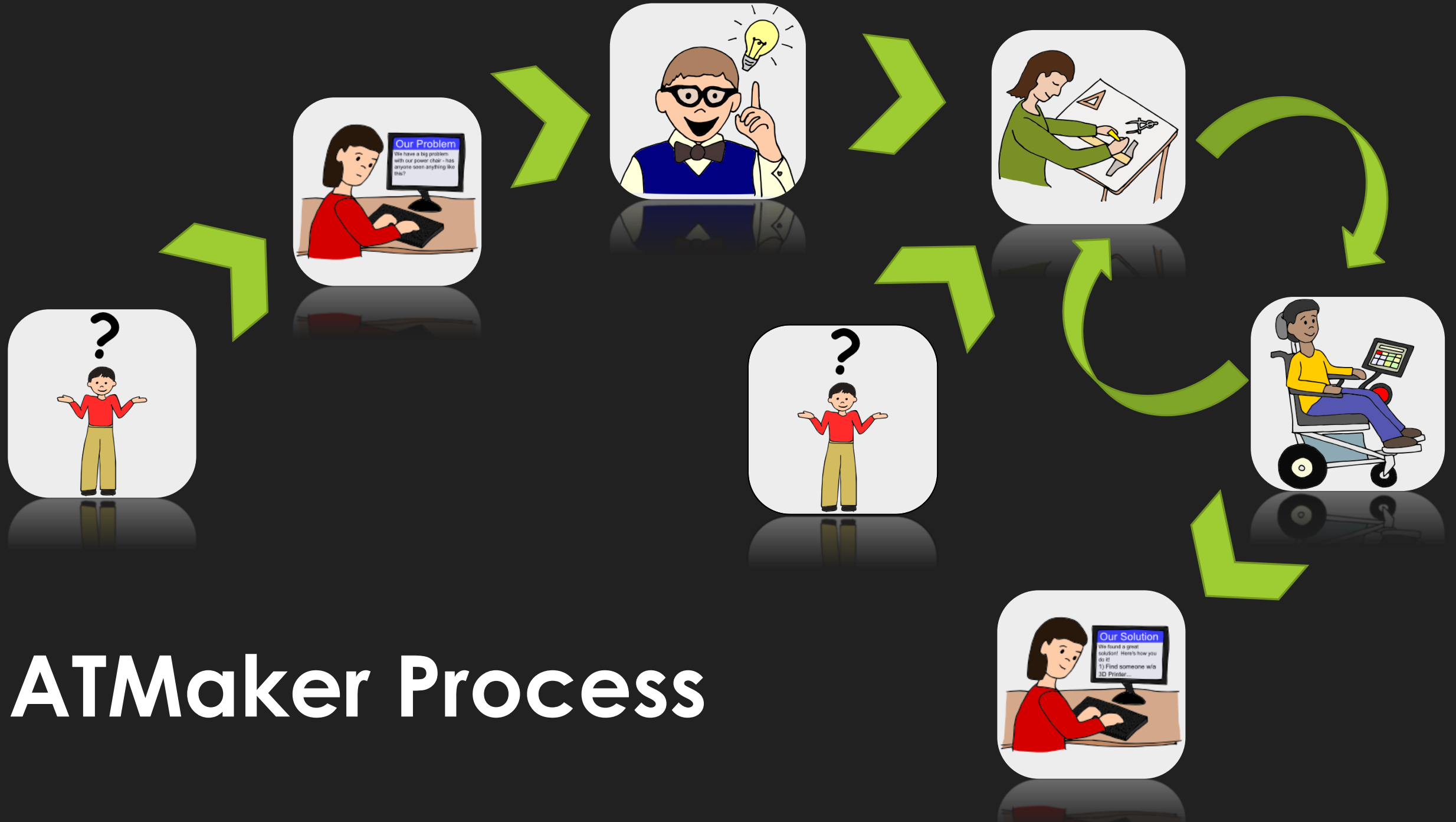


PENN
High School
Mishawauka, IN





ATMaker Process



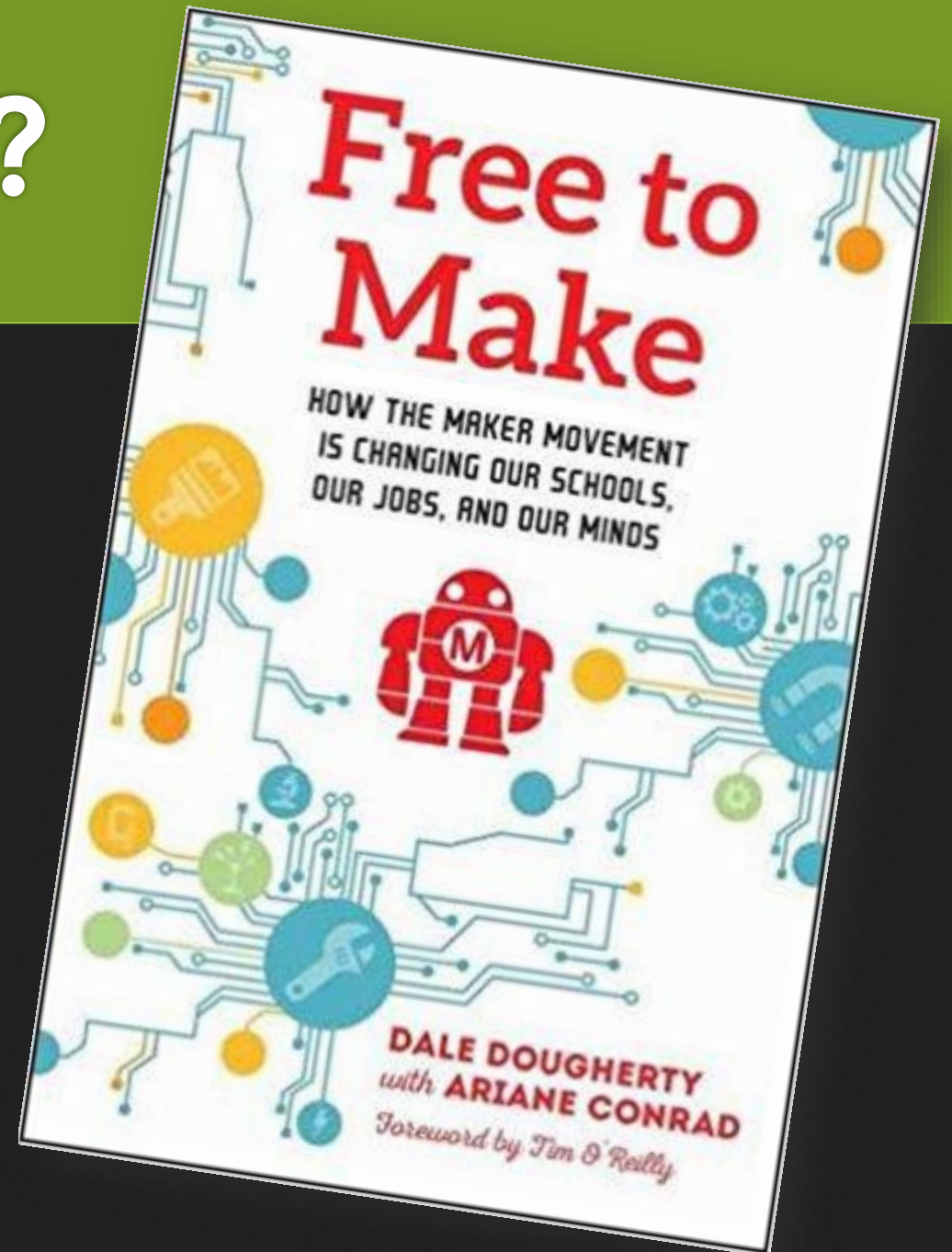


Where it Breaks Down:
End Users Don't have
Local Makers!

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



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
 - 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)





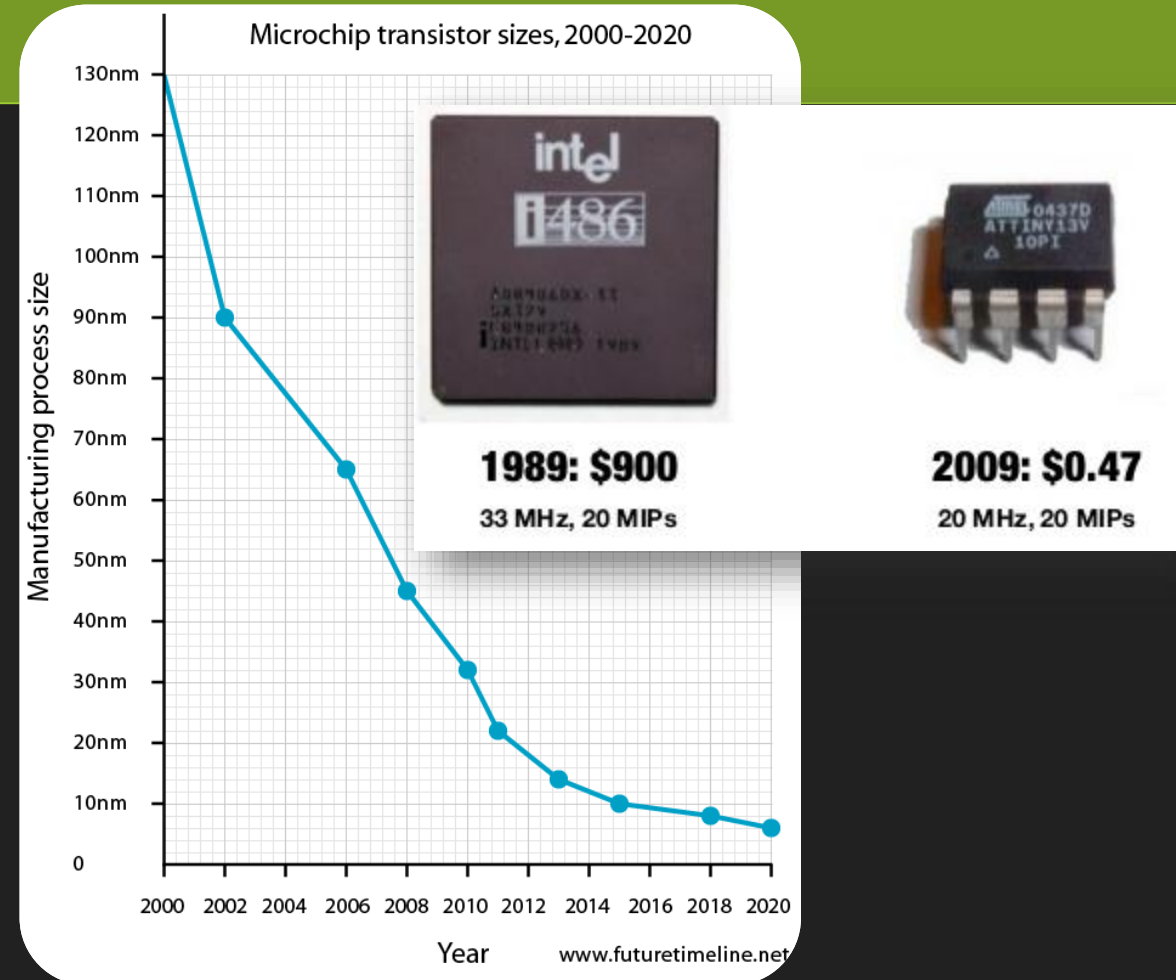
The Last Straw: 'Sup Brows

\$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 or the Facebook Group

Compensating the Kids (yes, really!)

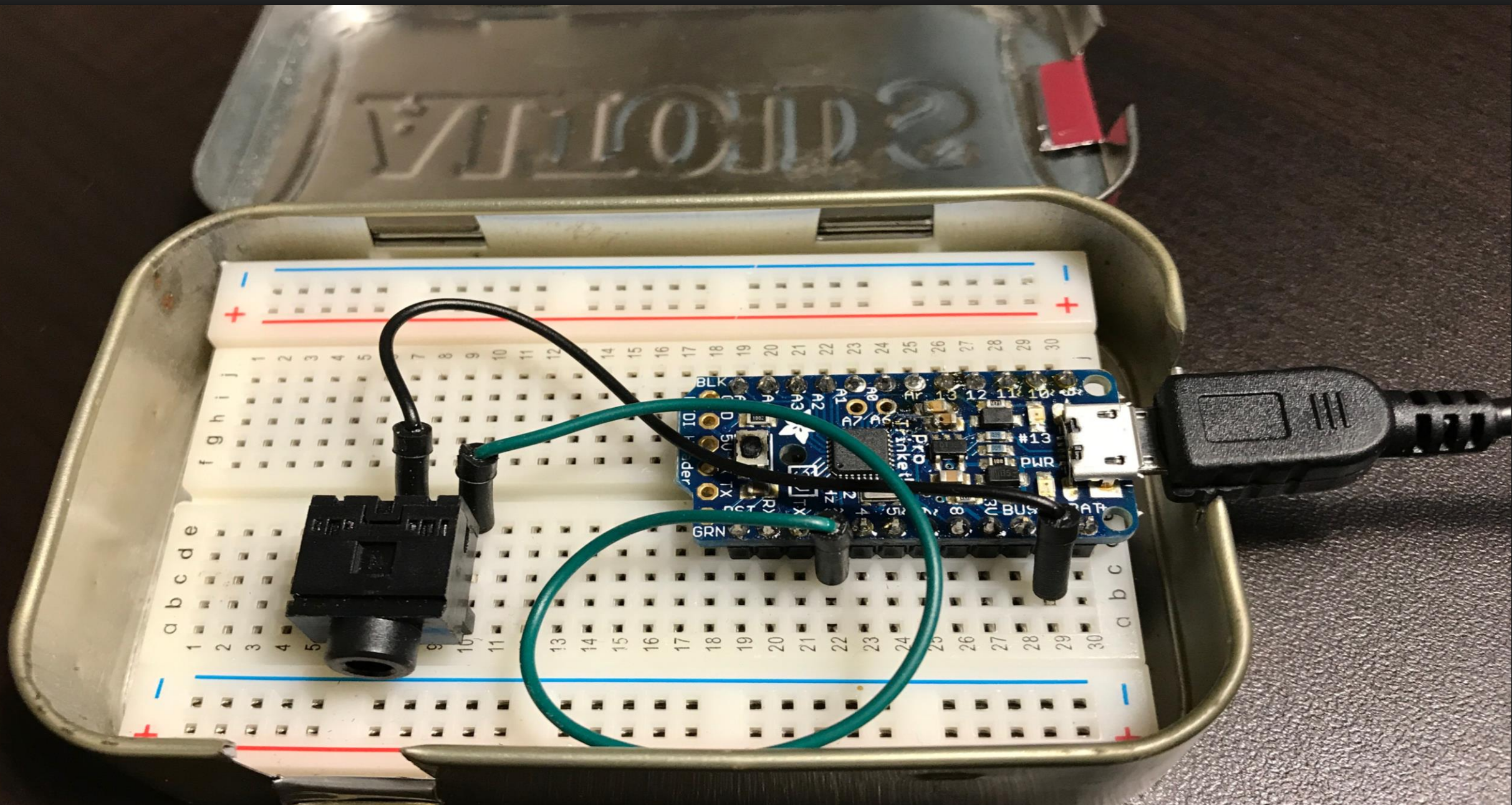
1. Everyone needs compensation – this is real work!
2. Teens value “making a difference” (now!)
3. Involve the teens with your clients directly
4. Allow them to show off their work (photo releases)
5. Provide validation & documentation of their efforts
 - They are applying for college/scholarships/Chairman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



Skills Needed:

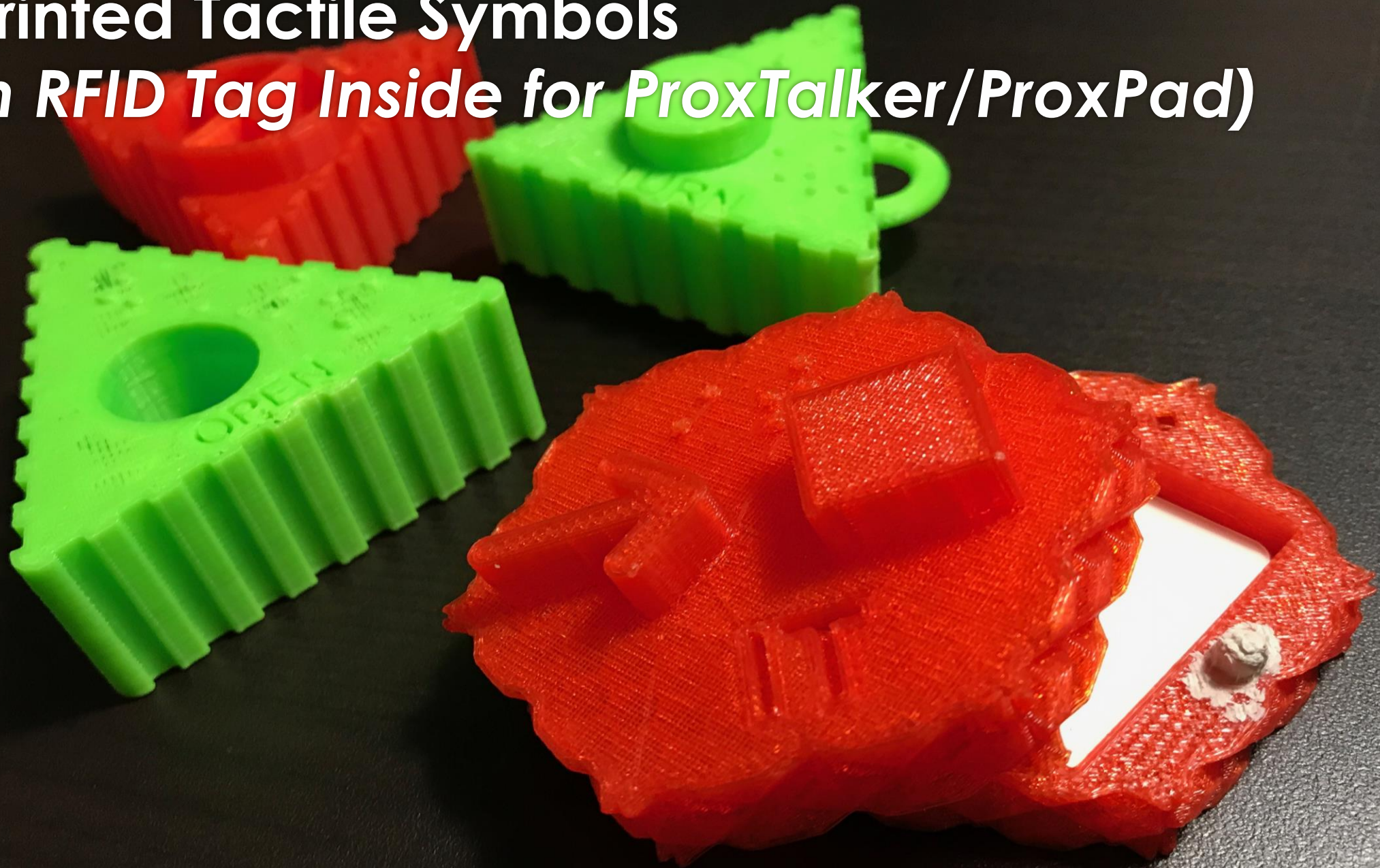
- Basic Electrical Circuits
- Strip/Crimp Wires
- Simple Body Mods
- Switch Mounting

Solderless AT Switch -> USB Keyboard Interface



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



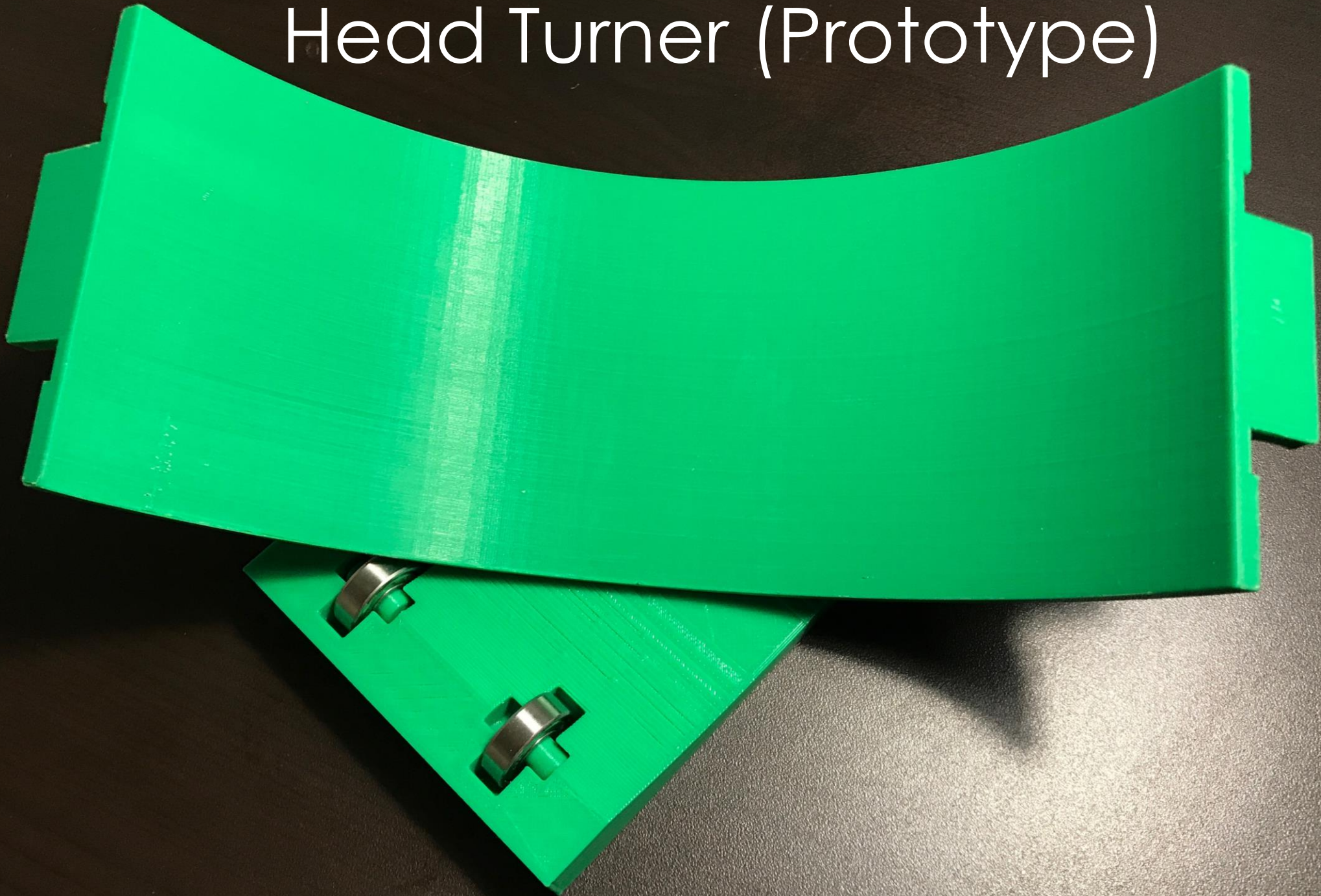
Camera Mounts for AT Switches



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.

