



**Team Members:**

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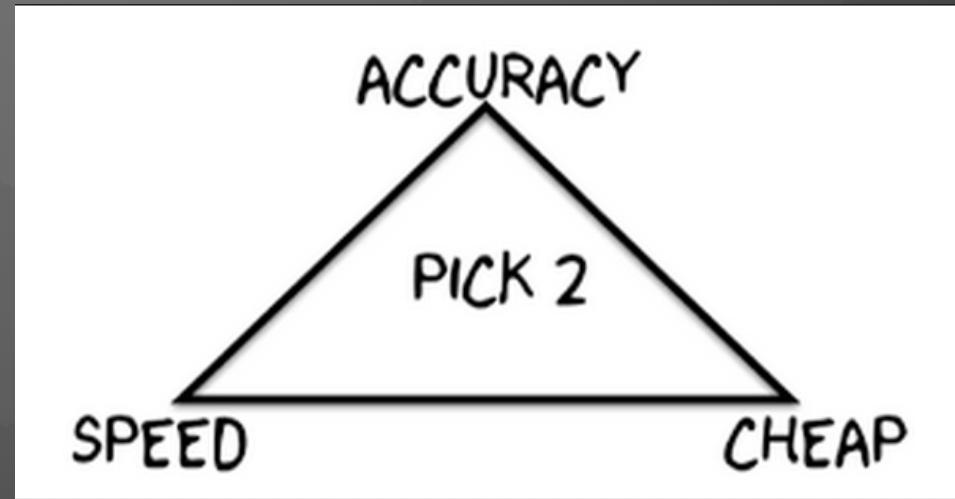
# Motivation

- Counting
  - People
  - Things
  - → Make lives easier through more information?

**Idea: Build a general counting system to that can be tweaked to solve a variety of counting problems**

# Specifications

- General, but customizable
- Accurate to the common case
- Cost Effective
- Scalable
- Easy to maintain
- Real-time or near real-time data



# Testing Strategy

- Incremental is better
- Verify things work at different levels
- Subsystem → Inter-Subsystem → Full system → PCB → Full System

# What did we accomplish last week?

- Voice recognition improved (also added personality)
- Subtle (but important!) modifications to counting algorithm
- Modified system to allow multiple people to enter and use voice identification
- PCB soldering
- 3D printed housing for Arduinos



# What problems did we encounter?

- Resolved
  - Counting and using vocal id for more than one person
  - Voice recognition module not interruptable
  - Full system integration
    - Problems with voice recognition module serial
- Unresolved
  - PCB error

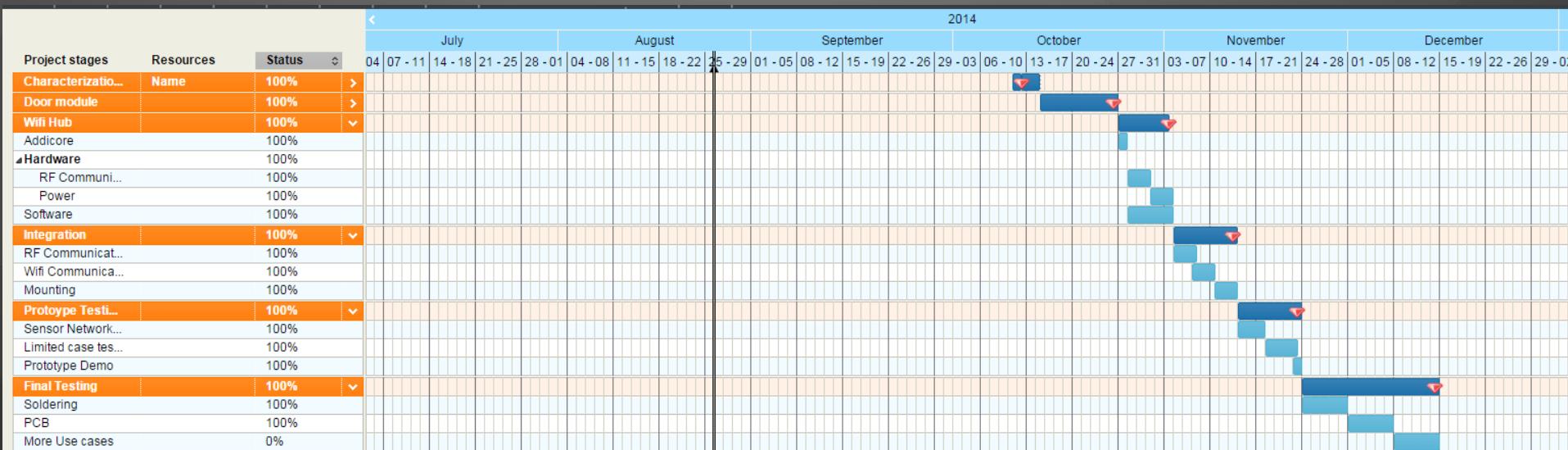
# Extended Discussion of other issues

- False Flags
  - Actually being seen vs. reflection
- 3 - wide door (and how we'd fix it now!)
  - Apply our new approach to an old problem → new solution is scalable!
- Consistency in readings
  - How we dealt with ping sensors giving odd values
- Dealing with noise
  - Through thresholding, moving filters, and other craziness

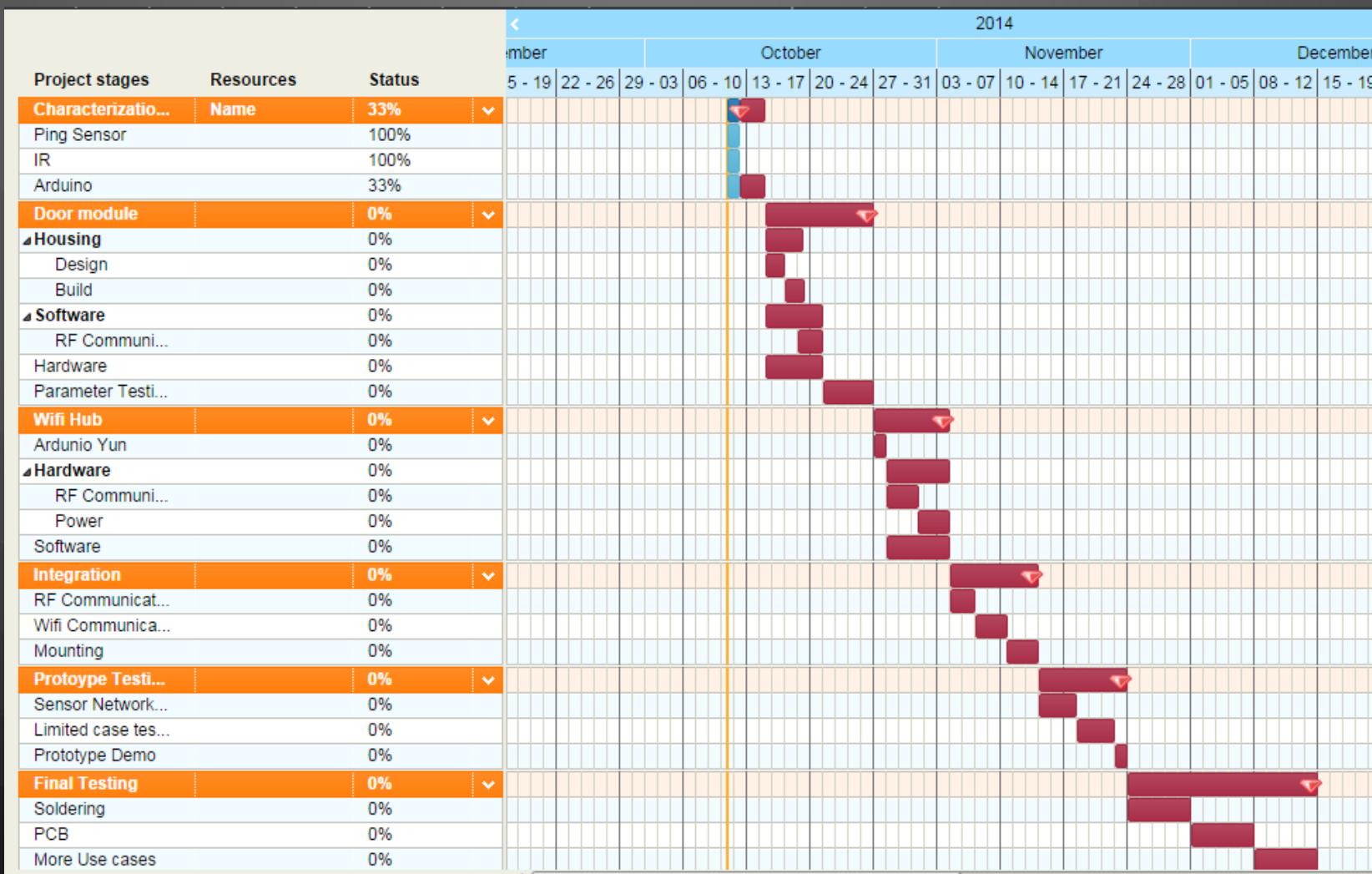
# So how do we feel about everything?

- Performance of our hardware?
  - New voice recognition algorithm is better, still could be improved
- Robustness of our implementation?
  - New orientation + thresholding + serial ping = best performance we've seen yet
  - Solves for common case well
  - Voice Recognition Module tends to be point of failure
- Did we meet our goals?
  - Yes.
  - Can we do more? Always.

## New Gantt Chart



## Old Gantt Chart



# Budget Update ( 😭 )

Items	Quantity	Total Price	Member	Vendor	
SparkFun Xbee WiFi module	1	\$38.96	Minhaz	Sparkfun	
SainSmart Xbee Shield (x3)	3	\$45.51	Minhaz	Amazon	
Ethernet Cable (x2)	2	\$19.98	Minhaz	Amazon	Total
OSHPark PCB orders	3	\$151.00	Minhaz	OSHPark	\$664.17
Sainsmart Pings	5	\$34.95	Anshuman	Amazon	
Sainsmart Nanos	2	\$28.00	Anshuman	Amazon	
nRF24L01	2	\$19.80	Anshuman	Amazon	
EasyVR Voice Shields	2	\$108.94	Anshuman	Sparkfun	
10MHz Crystal	1	\$3.39	Anshuman	Digikey	
PCB stuff	1	\$83.64	Jon	Digikey	
More PCB stuff	1	\$130.00	Jon	Amazon	

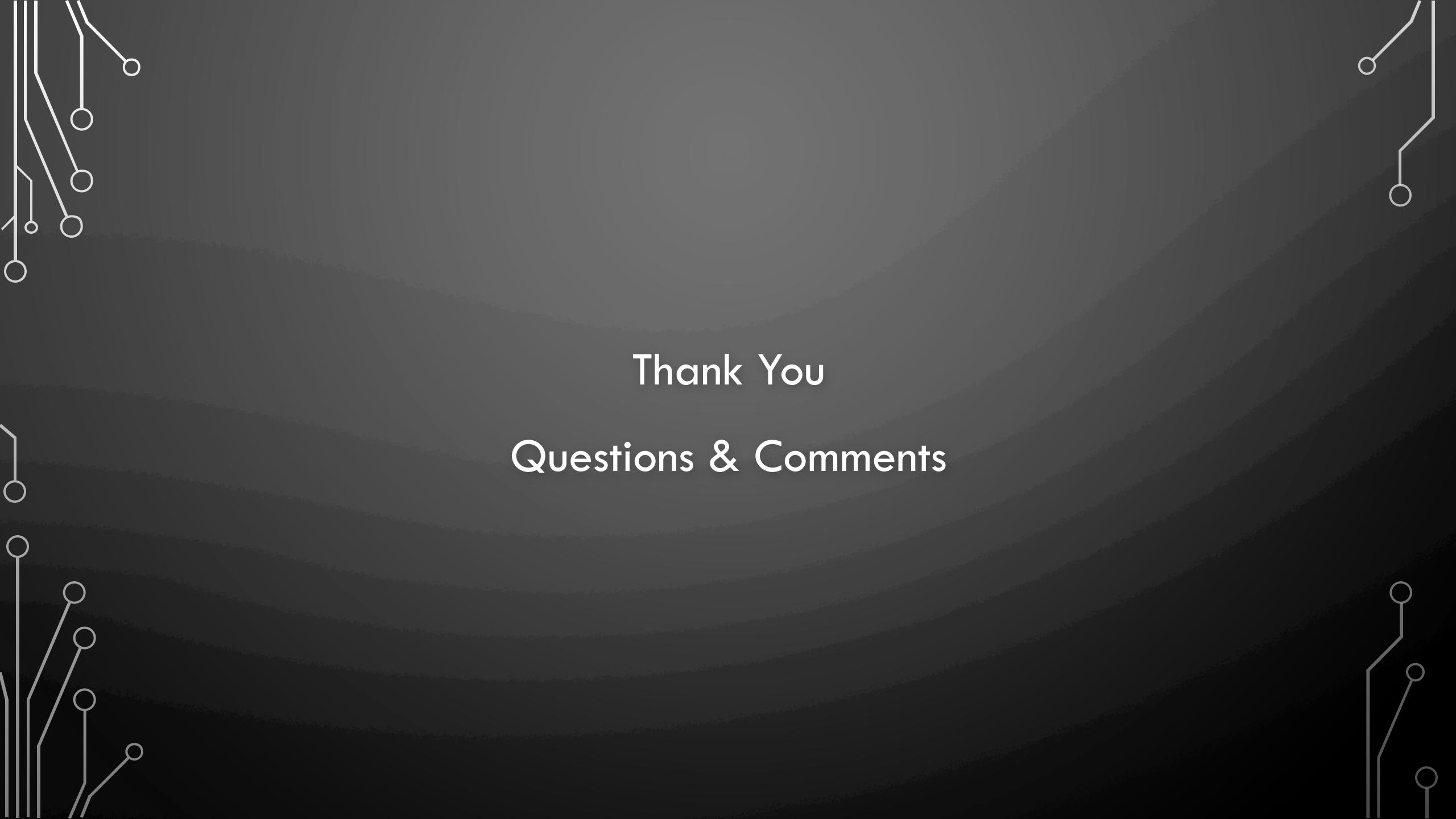
# PROJECTED COST OF REPRODUCTION

- Cost of 2 pings (7 each)
- 4 AtMels (7 each)
- 4 Xbees (25 each)
- 1 Voice Shield (50 each)
- PCB/Components (20/PCB + ~50 for all components)
- Ethernet Shield (8 each)

Total cost: ~\$330 (excludes shipping/tax/3D printing housing)

# REV 2.0

- Blinders around Ping (allows for scale)
- Use more energy efficient chip than Atmel328P
- Mechanism to handle errors over many hours
- Multiple entrance rooms



Thank You

Questions & Comments

