

## ***Team Meeting #4 Agenda***

### Old Business

- Check in on team assignments/action items from last week
  - Weekly meeting with client
  - Jett- shaver heads/vacuum considerations
  - Lucas- internal electronics, actuator
  - Maclean- motor/motor shaft designs
  - Ryan- battery technology
- Budget refinement as requested by Dr. Perry
- Prototype details

### New Business

- Determine when and how to begin prototyping
  - Sourcing materials
  - Refinement of Version 1
  - Parts Machining/3D printing
- Discuss topics for client meeting Friday at 4:00p (call Dr. Hiller @ 3:30)
- Any upcoming requirements?
- Jett still does not have access to the OneDrive file share

## ***Team Meeting #4 Minutes***

### ELECTRONICS SUBJECT TO CHANGE

Jett- Researched shaving bits on Amazon

- Burs for shaving could be used either with a rotary motor or solenoid
- [https://www.amazon.com/gp/product/B004H40AQY/ref=ox\\_sc\\_saved\\_title\\_1?smid=A1CU4YHM5NICIL&psc=1](https://www.amazon.com/gp/product/B004H40AQY/ref=ox_sc_saved_title_1?smid=A1CU4YHM5NICIL&psc=1)
- ~\$12

Lucas- Researched microcontrollers for device

- Adafruit trinket M0,
  - Uses Circuit Python programming or able to use Arduino IDE
  - Four mounting holes
  - 12V controlled outputs
- <https://www.adafruit.com/product/3500>
- ~\$9

Maclean- Researched DC motors to acquire linear motion, small ones are expensive and in adjustable

- DC push-pull solenoid may be a good option (pulse 3mm when active), ~\$15, solenoid could be disposable
- <https://www.actronic-solutions.de/linear-solenoids.html>

### Ryan- Researched batteries/power sources

- roughly 500mA hour battery for ~9000RPM/2hrs, charge multiple batteries at once, drone batteries may be viable
- [https://www.amazon.com/Battery-Charger-U818A-1-Quadcopter-Compatible/dp/B0746JGS4T/ref=sr\\_1\\_2?dchild=1&keywords=3.7v+500mah+lipo+battery&qid=1601419611&sr=8-2](https://www.amazon.com/Battery-Charger-U818A-1-Quadcopter-Compatible/dp/B0746JGS4T/ref=sr_1_2?dchild=1&keywords=3.7v+500mah+lipo+battery&qid=1601419611&sr=8-2)
- ~\$20

### Project Budget Refinements

- Dr. Perry asked that we potentially put together a budget for a few actuation methods
- Ryan will include costs of prototyping in the budget as provided in these minutes, as well as push up the deadlines so that we may prototype earlier

### **Next Meeting- Look over prototype at 3:30 on Thursday in ME lounge in EP**

Prototype material sourcing and refinement- Amazon and McMaster are easy to source; Dr. Perry will look into this

- ARF Index w/ Dr. Perry
- We can purchase and be reimbursed or Dr. Perry can source material
- It is good to set up an educational/business account

### Client Meeting with Hiller

- We should go into meetings with a narrow mindset and specific question set
- Provide Updates:
  - Design
    - Slim down handles and ergonomics
    - Variable speed- Set choice and create a toggle
    - Trigger is the set on/off switch, easy to release
  - Materials we may source
    -
  - Solenoid design viability
  - Asking about design testing on chicken bone
    - Cow cartilage is probably similar to knee, client could sponsor
    - Can prototype on chicken
  - Why did he like the toothbrush?
    - Not a spinning device
    - Random orbital sander motion could be useful but is difficult to conceptualize within the small space

Action Items: TBD Until Thursday Meeting!

### Lucas Discussion Items from his Weekend Meeting

- Toothbrush gave the best sanded surface, battery was able to last an appropriate amount of time
- Variable speed is important, prototype should refine old design and incorporate variable speed
- Recommending to production- outsourcing to production companies, use materials on hand for prototype
- Inner shaft/head stainless 316L, outer shaft- aluminum with surgical grade coating (stand up to saline solution)
- Recommended against on/off switch