

Jon Schull Interview Questions on 08/27/15:

- 1) Can we list you (Jon Schull) with your contact information on our project website (EDGE)?

Yes

- 2) What would you like to test with this apparatus?
- Full hand or individual fingers?
 - Adaptive versus standard (?) grip?
 - Longevity of the hand?
 - Materials?

Test both full hand strength and individual fingers if possible. Also, include some way of measuring "gripiness" if possible. The cylinder slip test is useful.

- 3) How many models of hands should we test? How many sizes?

Cyborg Beast, Raptor, Raptor Reloaded, Phoenix, and others are all e-NABLE designs that should be tested. If possible, test a commercially produced hand as well

- 4) What do you mean by "sweep" of angles?

Measure the angle of the wrist flexion, with a graph plotting force exerted against the wrist angle. A more efficient hand should have a more linear relation between force and angle. Another method of testing is the slippage test. One idea is to test grip strength by using a sealed bottle attached to a manometer. He is willing to sacrifice individual finger data for a squeeze and slippage test. The whippetree is a different mechanism that is certainly worth testing.

- 5) Is the force of the hand suppose to be comparable to the end users other hand? What are the limits on the forcing applied to the hand?

Hand prostheses will not measure up to the strength of a human hand, at least not for the purposes of this prototype

- 6) How do you perceive the data to be presented? Draw us a picture or graph with axes labeled.

Display the data collected as graphs. Make sure to test multiple materials and finger grips

- 7) Can you describe the process you would like to see when using this apparatus?

Focus on the slippage test and overall grip strength. Create a design that allows for a constant, adaptive counter-force to be applied, such as a water balloon or compressible bottle.

- 8) Who do you think will be replicating this for future testing?

- a) Size constraints?
- b) Cost constraints?
- c) Technology constraints? (Software)

\$200 should be the maximum for construction. The apparatus will also need to be calibrated and validated afterwards. Focus on reliability. For Technology, Python or Javascript are preferable. Store the data on the computer, with the program automatically generating graphs. Motors are not needed

- 9) Are there other groups/individuals that are working on testing devices for these prosthetics as well? ... What projects/devices?

There are people applying for a grant at Carnegie Mellon, otherwise nothing that he knows of. Look into commercial testing procedures

- 10) Are there users that are having trouble with grip strength?

Yes, though there hasn't been much systematic testing yet

- 11) What is the FDA's stance on this type of device (Class, type of testing required? Should this be taken into consideration in our design?)

Due to our non-sold status, the FDA has placed us in the discretionary class. This means there are almost no official restrictions, though they can change this.

- 12) What is your long term goal for this project?

- a) How far do you expect us to take this?
- b) Automation?

(Question not recorded or asked)

- 13) What is your availability?

He will have unpredictable absences the entire year, aim for one meeting per week and expect one meeting every two or three weeks. He would like to be introduced to Zona and Hanzlik soon.

- 14) What are we allowed to use in the lab?

- a) 3D Printers?
- b) Filament?
- c) Already printed models? (That are in the lab.)

Jade Myers is the lab manager, contact her for further clarification on our lab privileges. He has no problem with us using the equipment in the lab

- 15) Would it be acceptable to post on the e-NABLE community about our project?

Totally, he very much wants us to participate in the e-NABLE community. Ask e-NABLE about their knowledge of industrial testing standards for hand prosthetics

Follow-Up:

- Lusie will be fitted for a new prosthetic on 8/29 at 2 PM***
- Next meeting with Schull scheduled for 9/3 at 4:30 PM***
- Watch the talks recently presented at the Amputee Convention in Tuscan, AZ***
- Have group meet at Salsarita's at 8/29 12 PM in preparation for Lucy's fitting***
- Brainstorm ideas for solving the mechanical challenges of the design***