Radhanath Purakait

Donghyun Seo

Shalih Miah

Eric Luu

Sobur Carim-Sanni

**Discussion:**

After the last meeting we went back to do more research on prior art and added to our project specifications. We have also concluded to design our product for anxiety and depression patients. We chose to focus this application because anxiety disorder are the most common mental illnesses in the U.S., and it affects 40 million adults in the United States.

**Some of the update during our research are**:

According to our research current below 4mA was said to be the safest for tDCS devices. The head impedance we found is about 1.5 to 1.8 kohm Our aim is to produce a voltage output of about 20 V to 43V which most devices in market do.

**Some of the ideas while brainstorming for the circuit design consideration include**:

Having 9 V batteries in series to produce the voltage of 20v to 43v which will be about 2 to 6 batteries respectively. Having smaller 3 V coin cell batteries (10-20) to generate the amount of voltage we researched for our device, in order to have a smaller device. This is a shift from our original plan to step up the voltage from a lower voltage. We think this idea may be more viable than we once thought in that it can fit in the right form factor.

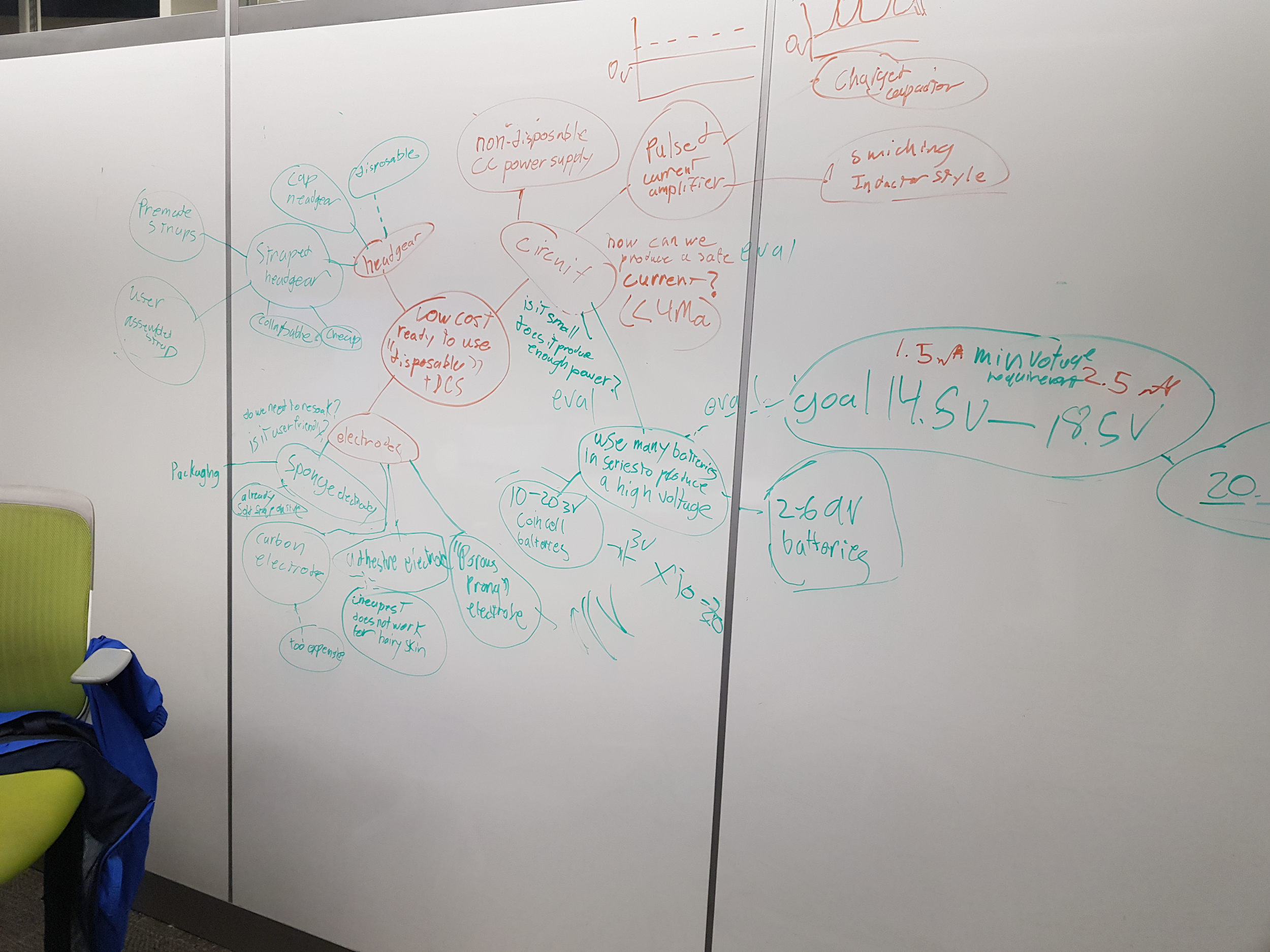
We discussed rather than sticking to a direct current we are also looking into pulse current stimulation. We are thinking about the pulse stimulation as this might help in simplifying our circuit design and cost of the device in general. Our idea was from the thync device that releases pulse stimulation to the brain, even though expensive.

We also Discussed different ways we can evaluate the ideas we came up with. With the circuit we believed the most important factor was the cost and form factor. We also considered the fact that a design with a non constant or regulated current could be ok so long as the current is safe. This opens up more possibilities in that circuit designs that are simpler may be considered at the cost of not knowing precisely what the current is.

**Some of the suggestion for the electrode design consideration include**:

We found a prong like electrode in Halo sport device, that eliminates the issue about hair getting in the way during the sessions. More research are to be done about having them pre soaked for straight out of the box use.

The biggest challenge we wanted to overcome was the fact that current sponge electrodes that were on the market were not moist enough and have to be soaked to be applied to the head. This is because prepackaged we sponge electrodes can grow mold if they are too wet. We came up with designs that use spikes to directly touch the scalp and we came up with ideas of having a saline ampule in the sponge to further soak the electrode. These designs need to be evaluated on safety and usability.

****