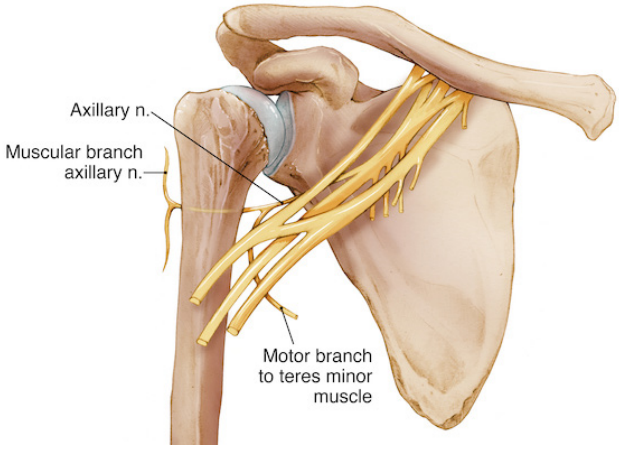
JUNE 2019

ANATOMY RESEARCH FOR POSITIONING DEVICE



Knowing that the size of the chips would necessitate somewhere larger than a wrist, we looked at the anatomy of a human to determine the best location for our device and confirmed our suspicions that a neckband would be our best option. Furthermore, we determined that the ends of the neckband would rest best near and just-under the collarbones due to a cluster of nerves that is present in that area.

MATERIALS RESEARCH

At this point, we made miniature test prints of the neckband device with the 3D printers we had considered in order to confirm our suspicions that the Ultimaker would be our best option. The first was printed with the Forms Lab printer and an elastic resin. This prototype proved to be too flexible, especially when compared to the second print which was done with the Ultimaker and the TPU 95 flexible resin. With this, we concluded that we would be moving forward with the TPU 95 and the Ultimaker for further prototypes.

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CONTINUED PROGRAMMING RESEARCH

We knew that we were going to be coding in Android Studio, a free android application development software with wide online support, as Android was the most accessible of mobile platforms. Throughout the summer, we researched how to connect Android and Arduino and how to work within Android Studio, as well as collected resources on Java programming. In particular, we focused our Java research efforts on those related to building a music player and creating a user interface.

Android studio

- Wide online support
- Free software
- Lead programmer had an Android device
- Mobile design class in the fall

Arduino

- Adafruit drv library

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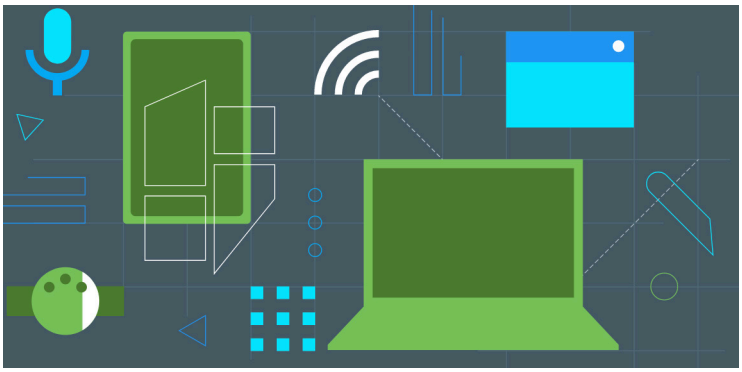
APPLICATION DESIGN RESEARCH

Android Developers App Guidelines



Additionally, we researched design guidelines for Android applications, including, but not limited to, the Android Developers App Guidelines, Google's Material Design basics, and other popular music player applications that were found on mobile devices (Android or otherwise).

Material design basics

- Patterns
- Style
- Animation
- Layout
- Usability
- Components

Understand look and feel of popular music player app and music player apps that contain a visualizer

What are common functionalities

- Play pause, skip, scrub through
- Music library w/ different kinds of organization styles
- Playlists

What layouts feel/perform good

- Dedicated music library pages
- Stationary/anchored music controls
- Dedicated visualizer pages
- Clear navigation controls