

BME 484 Biomedical Engineering Capstone Design
Project Proposal

Project Title: Android Application to Facilitate the Learning of Traditional Chinese Medicine Pulse Diagnosis via Wrist Pulse Simulator Technology

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Abstract: Pulse diagnosis is an important evaluation technique in Traditional Chinese Medicine (TCM). It involves the palpation of the radial arterial pulses using three fingers to recognize 29 different pulse patterns using pulse strength, depth, and rate to diagnose various ailments. Due to the infrequency and subtlety of numerous patterns, it is difficult to train practitioners to correctly identify said patterns and ensure that the diagnosis correlates with that of other practitioners. The aim is to create a user-friendly application for students and doctors to effectively learn and experience even the most uncommon pulse patterns. Previously, a wrist pulse simulator was developed with a graphical user interface (GUI) for the design and execution of any desired waveform to simulate palpating forces in the wrist via solenoids. This study aims to improve previous developments by incorporating a bluetooth module that will connect to an Android application, allowing wireless access, programming, and control of pulse waveforms for studying and teaching purposes. This will create a reliable and repeatable pedagogical standard for TCM students and doctors, improving consistency in the field of TCM pulse diagnosis.

Innovation: Our novel idea is to design an Android Application that will communicate wirelessly with the existing Wrist Pulse Simulator via Bluetooth. We will also expand on the existing hardware by incorporating size-variable contact points that simulate different artery widths.

Materials: Dragon Skin® 20, \$30.10 (2 lb x 1) Trial Unit
<https://shop.smooth-on.com/dragon-skin-20>

Alginate Molding Powder, \$31.68 (3 lb x 1)
https://www.amazon.com/Alja-Safe-Alginate-3-lb-Box/dp/B000KVSU60/ref=sr_1_1?ie=UTF8&qid=1505849975&sr=8-1&keywords=alginate+molding+powder

Solenoids (x 4)
<https://www.adafruit.com/product/2776>

