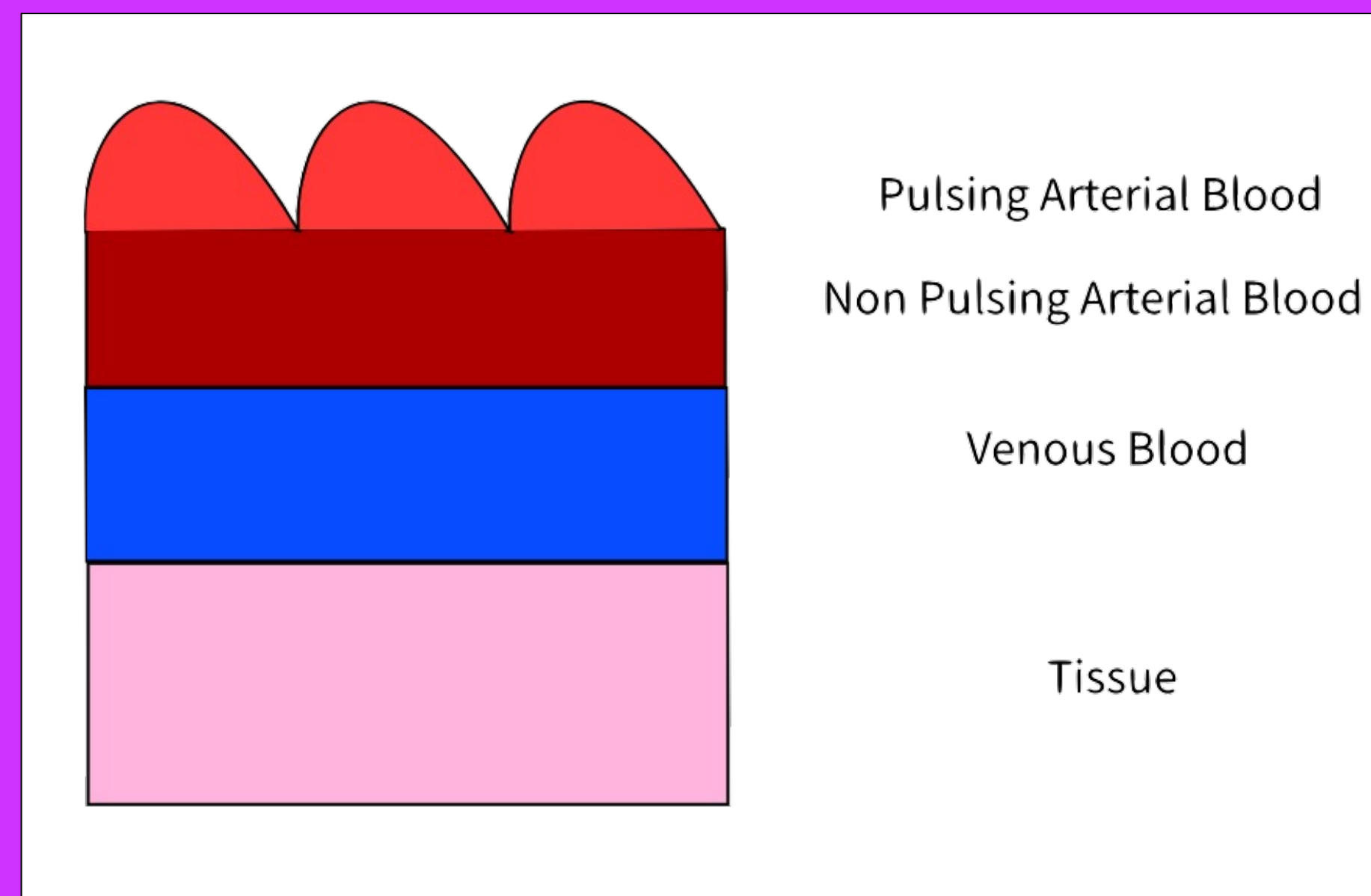


Problem

The pulse oximeter is a tool used to read blood oxygen levels of a patient. This instrument was originally calibrated on Caucasian skin tones and returns increasingly erroneous results for darker skin tones. Such error significantly impacts a patient's treatment when they are on the cusp of needing to be administered oxygen

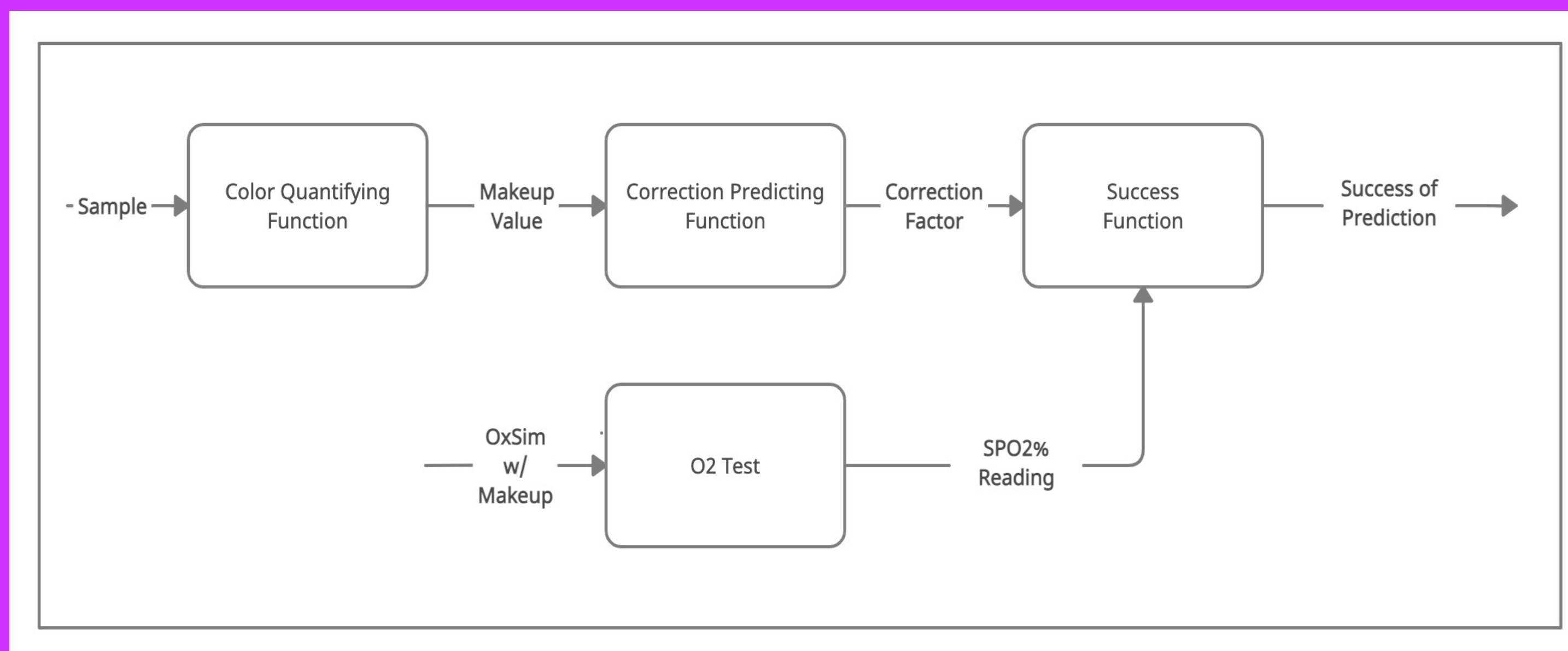


This figure shows the layers that light travels through to be measured. There are lots of places for light to be absorbed before the pulsating blood

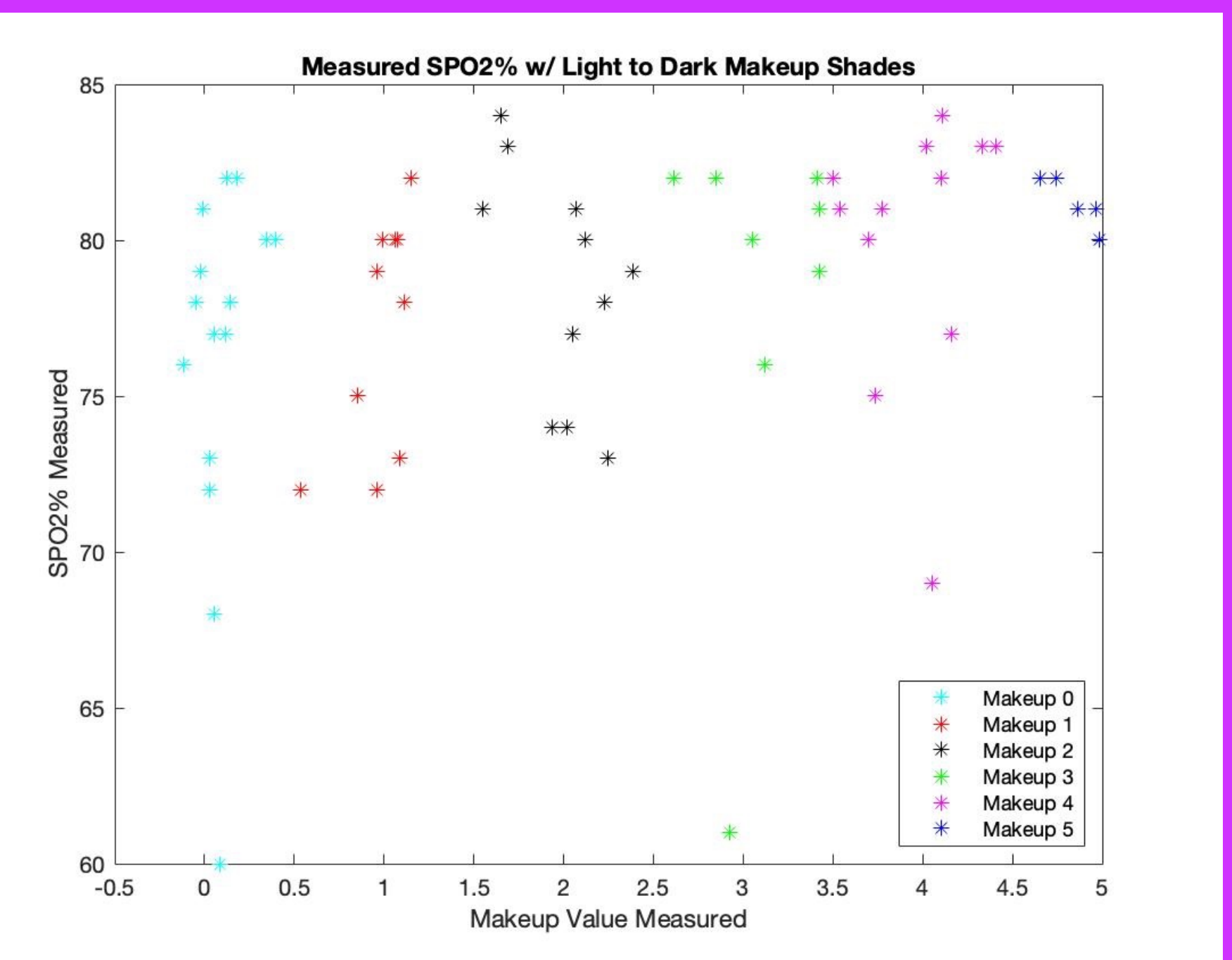
Project Overview

- Using makeup as a stand in for skin color, found how skin color correlates to error from pulse ox and an OxSim to have a constant value of SPO2%
- Using computer camera to generate RGB values of the make up to have a value for the different makeups used
- From data collected, use algorithm to predict amount of error based on makeup
- Using Bluetooth to connect and measure an actual SPO2% that is adjusted by the error predicted
- Compares the predicted SPO2% to the actual constant value to determine success

System Diagram



This Graph shows how each shade of makeup affects the reading of SPO2%. The 6 colors represent the 6 shades of makeup used and the range of each individual shade shows the ranges of reading received in 15 measurements.



Future Improvements

- Better flow of software
- GUI for ease of use
- More data to pull from for correction function
- Able to work in less-than-ideal lighting conditions



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Results & Conclusions

- Connected to external pulse ox with Bluetooth
- Processed color from laptop camera to quantify makeup
- Interpolated error based on gathered data
- Produced a corrected SPO2% based on makeup value