VALIDATION AND CHARACTERIZATION OF IMAGING TECHNIQUES FOR IRON SENSORS

Diwitha Rajmohan[1], Asher Hendricks[1], Margaret Mcaul[2], Ngan Anh Nguyen[1], Simon Oduwole[2], Erica Forzani[1], Gregory Raupp[1]

[1] Arizona State University [2] Dublin City University

INTRODUCTION

- Iron is one of the minerals that our body needs in order to perform various vital processes.
- To address the need for efficient testing of iron deficiency in blood and determining iron levels in water, previous research conducted at our laboratory has developed a novel iron sensor.
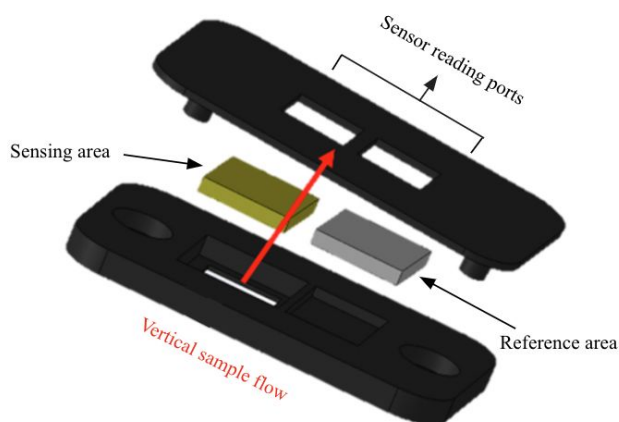

Figure 1: Diagram of the sensor

PROJECT AIM

Research different methods of finding the RGB values and Region of interest (ROI).

Explore various modifications to the lightbox that enhance the efficiency and ease of the analysis process.
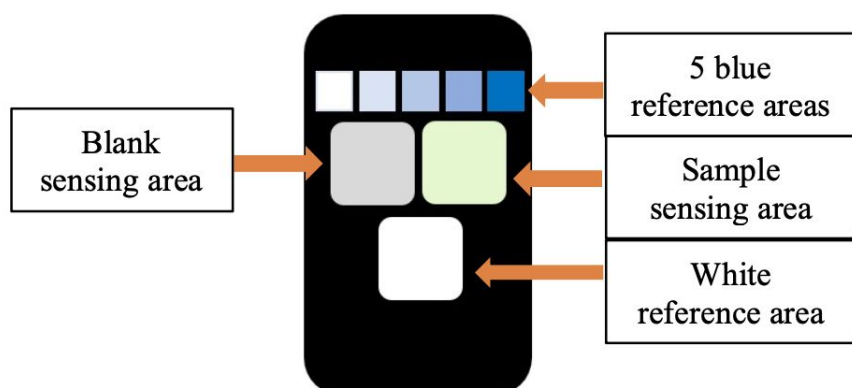

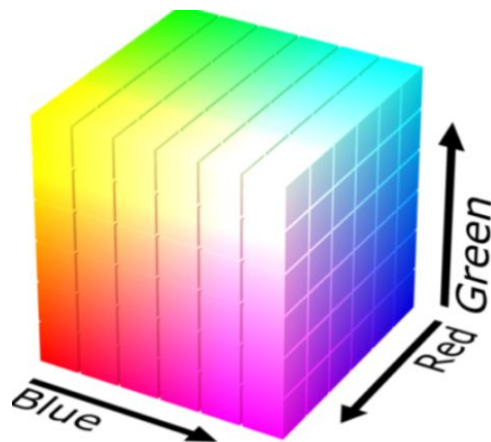Figure 2: Bottom view of sensor strip with 5 reference areas

Figure 3: RGB color space

PROGRESS

A comparative study was conducted between ImageJ and an online Pantone matching system

The key differentiating factor observed during the study was the speed of the Pantone matching system in both the image processing and ROI.

In terms of ROI calculation, ImageJ outperforms the online Pantone matching system as it averages the RGB values of an entire area, whereas the Pantone matching system relies on a single point value.
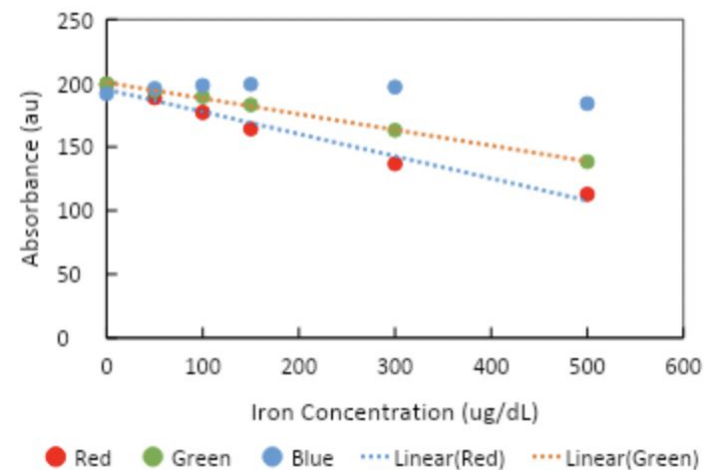

Figure 4: Graph from previous study using imagej

ONGOING WORKS

- Light box is being remodeled to include a new compartment specifically designed to accommodate a constant reference cell.
- An additional sensor compartment will be incorporated into the light box, ensuring that the sensor remains in a consistent position each time a picture is captured.
- By consistently capturing the picture of the sensor in the same position, it becomes easier to obtain the RGB value of the sensor using python with fixed coordinates.
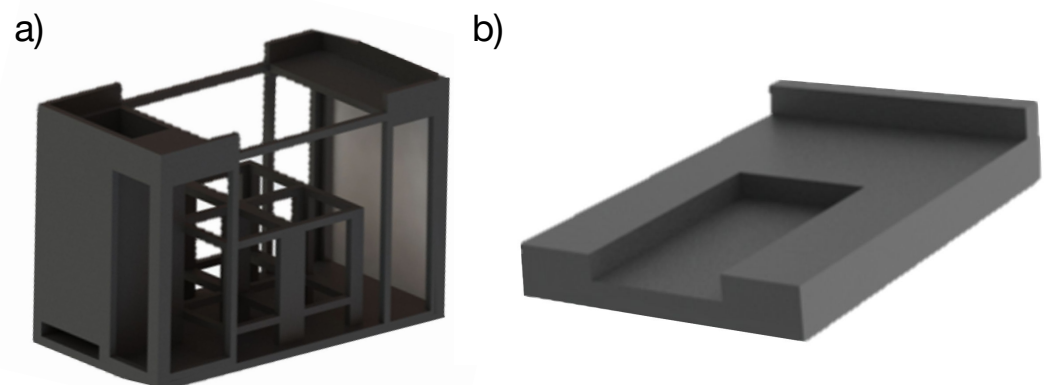

Figure 5: a) Whole view of the light box; b) Compartment inserted into the light box with sensor.

ACKNOWLEDGEMENT