Development and Application of Water Quality Detection Method Based on Smartphone Color Recognition

Han, Xinrui (School: Athens High School)

With water playing a fundamental and irreplaceable role in everyday life, water quality monitoring is crucial for preserving the aquatic ecosystem and ensuring a sustainable planet for the future. With the easily accessible water quality test paper being subjective to the naked eye and difficult to obtain agreement among different people, a new method for monitoring and detecting water quality using the smartphone's ability to recognize color was developed and applied to lakes around Ohio, aiming to obtain more objective data that could be agreed upon. Using the principle that all colors can be separated into a combination of red, green, and blue, the software app RGB ColorDetector and standard curves were generated from the colors detected by the phone. Test samples were detected by the app and the breakdown of the color was plotted on the standard curve to obtain the matching concentration. The standard curves were able to produce accurate and objective measurements of the concentrations of the different substances in the collected water samples. This newly developed method using smartphone color recognition proves to be a reliable method for detecting water qualities.

Awards Won: