B28 The Development and Preliminary Validation of an App for Recording and Interpreting Colorimetric Drug Test Results

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After attending this presentation, attendees will be aware of the availability and capabilities of a new smartphone application to aid in recording and interpreting colorimetric drug test results.

This presentation will impact the forensic science community by demonstrating the ability of an app for Apple® and Android™ devices and software that runs on a Personal Computer (PC) and a Raspberry Pi that aids in the interpretation of colorimetric drug test results and also standardizes and secures testing records.

Millions of suspected drug-related crimes are reported annually in the United States. Colorimetric drug tests are used to aid in the identification of the substances, based upon their reactivity and the colors rendered with the test reagents.

A database of Red, Green, and Blue (RGB) three-point numerical colors for over 3000 colorimetric test-drug combinations has been recorded and uploaded to the app. Assigning numerical RGB values to the colors standardizes the color record and enables the use of an algorithm to search for the color in the database. The application searches the database and matches the results using a Euclidian distance algorithm or another algorithm designated by the examiner. The display lists the results. The suggested matches based upon the closest set of RGB values in the database are listed in rank order with accuracy of prediction for evaluation by a technical expert. The crime laboratory or another examiner can be consulted about the results in real-time through the secure server.

This study investigated colorimetric drug test results for 800 unique drug/test combinations. Three versions of the software were on a PC and a Raspberry Pi. The software has been tested on Samsung Android™ and Apple® iPhone® devices, a Dell™ PC and a Raspberry Pi B+. The Raspberry Pi, purchased from the Raspberry Pi Foundation, runs a Linux-based operating system, "Raspbian." The RGB value is determined using the ColorAssist app with the device camera light or using a mini spectrometer connected via the USB port. ColorAssist was demonstrated to outperform other similar apps for this purpose in a recent study. The software is a technical solution to limitations of visualizing color at crime scenes and due to constraints of human vision differences, training, and experience of the examiner. The apps also allow the user to view previous test results by date and time and to add case notes. Interpretation of controlled substances and drug standards via tests performed on different replicates, different days, by different examiners, and with different devices will be discussed. The functionality of the apps and results of a preliminary validation of seized substances using the software will be presented.

Smartphone App, Apple® iOS®, Android™