CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)
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Project Number
J1412

Project Title
The Identification Experimentation

Abstract

Objectives/Goals
Fingerprints are unique to each of us but obtaining a print isn't always 100%. This test was to determine which process would be most reliable of matching fingerprints to a set of test subject prints.

Methods/Materials
Baseline prints were taken from 3 test subjects and scanned into the computer. Three processes tested included standard black and fluorescent powders, and the third was a chemical reaction between heat and super glue. The black and fluorescent powders were applied to water glasses that each subject handled. Upon applying powder, clear tape was used to lift prints from the glass. Tape was then applied to a 3x5 note card and scanned into the computer for comparison. The chemical reaction process required a sealed environment. A glass with a subject's print was placed in a plastic container with a small bowl of water for humidity. A small aluminum boat with a quarter size of super glue was then placed on a hot plate and sealed in the plastic container. After a 10 minute chemical reaction process, the glass was removed, finger print lifted, then scanned into the computer.

Results
Results showed the fluorescent method to be the most reliable. Each subject was tested in each of the three tests. A defined set of numbers 0-2 was set to rate each fingerprint. A 0 was assigned to a print not having any distinguishable features. A 1 was assigned for prints having one distinguishable feature. A 2 was assigned to prints having 2 or more distinguishable features. Each test was added up. A higher the number meant a higher reliability.The fluorescent powder consistently had higher values compared to other methods. Out of a maximum value of 10 (two for each finger), the fluorescent power method had an average of 8/10.

Conclusions/Discussion
The conclusion was that the fluorescent powder method to be the most reliable. Reasons for inaccuracies were found in the techniques themselves. The black powder had issues lifting the prints using the tape. If air bubbles were present during lifting only a partial print would be lifted. It was found for the chemical reaction method the longer the glass was left to react with the super glue, the more smudged the print became. The fluorescent powder method had drawback when the print was lifted fingerprint was unable to be seen on the white cards. A different scanning method was adapted using a black light, photographing then transferring the image to the computer.

Summary Statement
I showed there to be a consistent method of obtaining and matching up latent fingerprints from household objects.

Help Received
My father assisted me in handling the hot plate and use of the super glue chemical. He also showed me how to build a spreadsheet in order to visualize and compare my data.