Name(s)	Project Number
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Project Title

An Accurate Lie Detector?

Abstract

Objectives/Goals

When people lie, their skin resistance can increase due to the release of sweat. This response can be used to build a lie detector. My science project titled, #An Accurate Lie Detector?# examines whether changing the band in a galvanic skin response (GSR) lie detector will improve its accuracy. When the lie detector is programmed to monitor the change in GSR for a fixed band (beyond which it detects a lie), it may not be completely accurate in detecting lies; the change in a person#s skin resistance upon lying may be different for different people. Calibrating the optimal threshold for each person may increase the accuracy of this type of lie detector.

Methods/Materials

The lie detector built for this experiment is a homemade detector described in an Arduino project book. I will be testing the device on about a dozen subjects. During the calibration testing, I will first ask them five questions, which they will answer truthfully. When they are answering these five questions truthfully, a Processing program will take the average skin resistance. This average is one side of their unique band between truth and lie. Then, I will ask them five more questions, which they will answer falsely. The average skin resistance taken by the Processing program when they lie will be the other side of the band. The range between the two averages is their unique band. This band will be then entered into the Arduino software. Lastly, I will ask the subjects ten questions, which they will answer either truthfully or falsely. The lie detector will determine whether they are lying.

Results

Without calibration, the lie detector had an accuracy of 38%. With calibration, the accuracy rose to 56%. Therefore, using calibration improved the lie detector#s accuracy. However, the accuracy was not much higher than 50% to consider this technique reliable because guessing randomly would be 50% accurate.

Conclusions/Discussion

Because this lie detector did not exhibit an accuracy much greater than 50% with calibration, I conclude that this method of optimizing the detector performance is not reliable.

Summary Statement

My project is about improving a lie detector's accuracy by calibrating each person's unique "band".

Help Received

Father provided inspiration; Mother helped with the report.