



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Aakash N. Shah	Project Number S1423
Project Title Single and Multi-Modal Biometrics Based Secure Authentication and Personal Verification	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals As the number of security breaches and fraud are on the rise, the need for highly secure authentication and personal verification technologies are vital. This project studies and summarizes extensive single and multi-modal Biometrics technologies based on physiological and anatomical characteristic unique to an individual, and are confidential and not intrusive. The project also provides the key advantages/disadvantages of each in the industry where they are being applied.</p> <p>Methods/Materials</p> <ol style="list-style-type: none">1. Thoroughly research each type of Biometrics technologies, research how they work and where they are used.2. Review how these are applied and identify pros/cons of each based on level of security they will provide.3. Depending on industry, the usage model and required degree of secure authentication, recommended a single or multi-modal Biometrics technology.4. Suggest best multi-modal combinations and highlight new Biometrics technologies to investigate. <p>Results My results explain and prove my hypothesis because it is clear that certain Biometrics systems can't work everywhere due to size, cost and relevance. See research report for details.</p> <p>Conclusions/Discussion The numbers identity theft is increasing day by day, which drives the need for highly secure Biometrics. This project summarizes extensive single and multi-modal Biometrics technologies based on physiological and anatomical characteristic unique to an individual, are confidential and not intrusive. I believe that the selection and modality of the Biometrics technology will depend on the cost, feasibility and ease of usage. My results are the following: Fingerprints are used in a variety of places, frequently used in forensics and the FBI database. The FBI database is said to hold the fingerprints over 51 million criminal record subjects and over 1.5 million civil (non-criminal) fingerprint records. Cost of Biometrics is low. Palm prints tend to be used in banks and different police forces, and cost is low to medium. Iris recognition is primarily used in airports, used to facilitate entry into the US for pre-approved, low-risk travelers, and used private companies/businesses, cost is high. Voice recognition is used in many medical research facilities and in different military bases across the world and the cost is medium to high.</p>	
Summary Statement Research Single and Multi-modal Biometrics - Feasibility and Improvements	
Help Received My father guided me for research.	