



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ish B. Bhanu</b>	<b>Project Number</b> <b>S1201</b>
<b>Project Title</b> <b>Face Recognition by the Computer</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My first objective was to determine whether the correlation coefficient can be used to recognize and distinguish human faces from each other. The second was to learn image processing programs for computing correlation coefficients on the computer. The third and final was to collect data of ten human faces in six different poses (normal, looking up, looking down, looking left, looking right, and smiling) and then to quantify their performances. <b>Methods/Materials</b> The correlation computing program was used. It determines how similar 2 pictures are based on the matrices that make up these pictures in the computer. MATLAB Image Processing Toolbox was used to compute correlation coefficients and to obtain a grey scale image from a color image. Other materials include Sony VAIO Computer, Sony digital camera, Canon printer. <b>Results</b> Two experiments were performed. Experiment 1: Recognizing one face from a database of ten faces, where each face had up to six variations. On the average it resulted in an 89% accuracy in determining whether a random face of subjects in different poses matched one of those subjects looking straight at the camera. Experiment 2: Distinguishing between two pictures of ten subjects in 6 different poses. The experiment resulted in an 82% accuracy rate in determining whether two pictures were different. <b>Conclusions/Discussion</b> Experimental results suggest that the computer had more difficulty in distinguishing faces from each other than just identifying whether or not a random face matched a particular face. As the number of subjects increase i suspect that the recognition performance will decrease. Thus the correlation technique used here needs to be enhanced with facial features like eyes, nose, lips, and etc. Also another question that I plan on researching is the performance of face recognition by humans and understanding the human brain.	
<b>Summary Statement</b> Recognition of the face by the computer, using the correlation coefficient, makes sense but it is not sufficient.	
<b>Help Received</b> My father introduced me to Dr. Nadimi (Pst-Doc) and Ms. Zhou, graduate student, at VISLAB UC Riverside. They showed me the MATLAB program.	