



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Christian Hahn	Project Number S1606
Project Title Camera Recognition Based American Sign Language Translator	
Abstract Objectives/Goals The design and construction of an American Sign Language-to-text translator for sign language users to communicate to anyone. My approach to this conundrum is to use a relative inexpensive camera, take a picture of the user's hand, map the position of the fingertips and then determine the distances in between the fingertips. These distance values can then be correlated to values stored in a database and assigned an alphabet character. The software in questions is written in C# with a clear and concise visual GUI to allow for fine-tuning at a testing level and future expansion towards an end-user application. Methods/Materials The goal behind this project was to maintain a definitive ease of use and simplicity of the implementation. This was done by using an extremely affordable PC webcam and (besides the computer /w software) no other physical components. The software's approach maintains simplicity to allow it to be hosted by low-power, handheld platforms. After the camera took a picture of the end-user's hand, the software determined the relative distances in-between the user's fingertips. This was done so regardless of how the user rotated his hand (relative to the camera) the relative distances between the user's fingertips remained constant. Results Through several trial runs of the system, the camera and software were successfully able to read-in and output the matching hand-sign alphabet. However, it is to be noted that these trials were conducted in a controlled environment (with controlled lightning and background) and not out in the field. Conclusions/Discussion Along with creating an effective end-user product, this project has opened many possibilities for future development and expansion. For example, making the software adaptive to the end-user's physical limitations (i.e. hand size) and perhaps making it aware of the hand-signers individual style and technique.	
Summary Statement The design and construction of an American Sign Language-to-text translator for sign language users to communicate to anyone.	
Help Received	