



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Amit S. Talreja	Project Number S0919
Project Title 3D Volumetric Projection Using a Microprocessor Controlled LED Array	
Abstract Objectives/Goals To create a true 3D display that does not rely on illusion of depth, design should be capable of projecting simple geometric shapes and some animation in three dimensions. Methods/Materials An Arduino# microcontroller is main processing unit and is programmed to control the display. The mechanical structure is built using Lego# components and consists of five horizontal arms rotated at very high speeds around a central axis by a DC electrical motor. Blue LEDs placed on these arms are sequenced by the C-based computer program to produce the desired image. Results The objective of the project was met because the design is able to display simple geometric shapes such as cones and cylinders. It can also project simple animations. The design accepts an input of a 3D shape and the computer program I developed is able figure the LED sequence in order to produce the desired shape. Conclusions/Discussion Though the project met its objective by developing a proof of concept for the display. I have identified the different improvements that can be done to make the design more robust. The concepts in this project can be applied to a number of real world applications. For example the software algorithm can be implemented in current 3D display technologies to make them more efficient. The mechanical design can be scaled up to make a practical display for hospital MRI scan projection or teleconferencing.	
Summary Statement Design and fabrication of a portable 3D display capable of projecting geometric models	
Help Received Mother helped lay out and glue board	