CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
Kouhei Ueno

Project Number
J1219

Project Title
Mathematics Behind Realistic Computer Graphics

Abstract

Objectives/Goals
My project's title is "Mathematics Behind Realistic Computer Graphics". I was interested in how realistic non-realtime computer graphics are made, so I made a 3D computer graphics program to learn computer algorithms to make realistic CGs.

Methods/Materials
I made a computer program to demonstrate algorithms I studied. I used three computers to develop and debug my program, but only one computer is needed for compiling this program. I used asemmbly (x86 and MIPS) and C++ for faster execution of the program.

Results
I made realistic computer graphics images from my program. It clearly showed correct shade, shadow, reflection, and refraction.

Conclusions/Discussion
I learned lot of computer algorithms from making this program. I never knew vector mathematics was used in computer graphics.
The program is significant because it is one of the few computer graphics programs that can run on a regular computer. It can even run on PocketPC PDA.
Sourceforge.jp agreed to support this opensource project. They provided me CVS, HTTP, and FTP webserver.

Summary Statement
This project is about making a computer program to learn algorithms and mathematics used for creating realistic computer graphics.

Help Received
Sourceforge.jp approved to provide web server (Apache & CVS) and compile farm for this open source project. My tutor helped me revise my English.