



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Philip Q. Shao	Project Number J1218
Project Title Practical Uses of Sampling Theorem	
Abstract Objectives/Goals The purpose of this experiment is to find the most efficient number of frames to capture key elements of a motion, and if the theoretical sampling rate works for the motion of a human being. Methods/Materials Using the plotting features of excel, I simulated human motion with a sinusoidal function. In parallel I took a movie of my brother doing a directed set of repetitive motions. I picked out frames of this movie based upon the excel simulation and ranked each sequence in order of how well it represents the true motion. Conclusions/Discussion I concluded that the theoretical minimum sampling rate is a fantastic guideline but is not entirely accurate on specimens like human beings whose motion is not a true sinusoidal function no matter how well they are trained. With this experiment, I was able to reduce the number of frames needed to capture the motion by 96% from 400 to 16 frames.	
Summary Statement My project sets out to find the minimum number of frames needed to accurately describe a repetitive motion.	
Help Received Mother helped proofread report and board layout.	