



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Betty C. Huang</b>	<b>Project Number</b> <b>S0207</b>
<b>Project Title</b> <b>Measurement of CD Deviations</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of this project is to see if all manufactured CDs have the exact same area and perimeter. If not, which brands have more deviations in their manufactured production and which ones have less? My objective is to measure the deviations of each brand through image processing with images of 50 CDs of each brand of CD, and putting the image through my written program that will then measure the area and perimeter of both the actual CD and the hole in the middle of the CD. <b>Methods/Materials</b> 50 Philips blank CDs, 50 Memorex blank CDs, 50 Imation blank CDs, 1 Matlab Program, 1 Adobe Photoshop Program, 1 Sony Cyber-shot Camera (5.0 Mega Pixels), 1 Camera stand, 1 CD lid <b>Results</b> The CD that cost the least (Imation) had the highest deviations in manufacturing. The CD brand that cost the most (Philips) had the least deviations in manufacturing. The Matlab program was successful in determining the area and perimeter of both the CD and its inner hole accurately. <b>Conclusions/Discussion</b> The higher the deviations in manufacturing per brand, the cheaper the price for a CD of that brand. Image processing that is run through the Matlab program is an effective way to verify the accuracy of measurements of certain objects and to determine the amount of deviation that occurs between two compared objects.	
<b>Summary Statement</b> Image processing is effectively used to determine accuracy & deviations in manufacturing per brand of CD; the cheapest brand, Imation, had the most deviations, while the most expensive, Philips, had the least deviations in manufacturing.	
<b>Help Received</b> Dr. Kung-Shiuh Huang	