



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Siddhartho Bhattacharya</b>	<b>Project Number</b> <b>S0902</b>
<b>Project Title</b> <b>Investigating the Cause of Anomalous Behavior in Operation of the Nintendo Wii System</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of this project was to investigate the anomalous behavior in operation of the Nintendo Wii system and identify the cause of this anomaly. The anomalous behavior was the occasional incorrect display and erratic movement of the cursor/pointer on the T.V. screen under certain circumstances. Since the Wii Remote contains an Infrared (IR) detecting device, it was hypothesized that the anomaly may have been caused by interference from sunlight or any other IR emitting sources in the operating ambience. <b>Methods/Materials</b> 1. The condition at which the Wii remote behaves erratically was identified and it was ensured that this behavior could be reproduced. 2. From the Wii technical specifications, the IR wavelengths used in Wii operation was found out. 3. To detect presence of IR in the operating ambience, an IR detector was built using an IR phototransistor and other semiconducting components and appropriate filter to pass the Wii range of IR wavelengths. 4. Data is collected with varying levels of exposure to sunlight and other possible IR sources such as flashlights, lamps (both incandescent and fluorescent) at varying distances from the detector. For measurements, oscilloscopes and digital multimeter were used. <b>Results</b> It was found that sunlight, flashlight and incandescent light have significant IR content. The light from fluorescent lamp has no or very little IR content. <b>Conclusions/Discussion</b> It was concluded that the Wii Remote was detecting IR light from sources other than the intended source and sent incorrect information to Wii console which caused the anomalous behavior. As a remedy, the IR light emitted by the sensor bar could be encoded to distinguish it from IR coming from other sources. This could prevent erroneous detection of IR light and incorrect operation by the Wii Remote.	
<b>Summary Statement</b> This project was an investigation to find the cause of anomalous behavior in the operation of Nintendo Wii in the presence of sunlight or other IR sources in the operating ambience.	
<b>Help Received</b> Used lab equipment at Via Telecom under the supervision of my father (Prasun Bhattacharjee); Mother helped prepare presentation board; Father provided transportation.	