



CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s) Abe N. Jellinek	Project Number J1411
Project Title The Three Little Pigs and the Big Bad Navigation Device	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To investigate, out of three techniques, which method of navigating in a 3D world is the most efficient for users.</p> <p>Methods/Materials Materials MacBook 13" computer; Minecraft 1.1 3D game software; IntelliJ 11, a Java IDE. Java libraries: LWJGL, Batik, a Scalable Vector Graphics (SVG) library, SoundSystem/3DSound. Methods 1.Wrote a program in Java for the Minecraft game, that allows a player to see 3D lines in the game world, pointing at other players. 3.Refined my idea to test efficiency of three modifications, one of which was the line. 4.Wrote code for compass. 5.Found map modification for Minecraft and adapted. 6.Wrote a program to time a person as they navigated in the world, and write their position to a file. 7.Decided to use pigs as points. 8.Created start for the test, and placed three pigs at equal distances from the start. 9.Randomized which pig, and which navigation technique, was used during the test. 10.At each pig, I placed a pressure plate for teleporting. 11.Created questionnaire program to run at the end. 12.Wrote script to read so that they would receive the same instructions. 13.Tested 12 people, all of whom said they were experienced MC users. 15.Created program to draw the path that people took when finding the pigs. 17.Decided to throw out ones that exceeded two standard deviations from the mean. 18.Figured out a way to compare time results. 19.Calculated mean time for all of each user's results, and expressed times per navigation device as a function of the mean. 20.Analyzed and compared the results. 21.Created graphs of correlations.</p> <p>Results More than 2400 characters of data from path images, raw times, deviation from mean, typical users, & perceptions of users.</p> <p>Conclusions/Discussion Analyzing the paths: #line was most intuitive #compass had a steep learning curve #map was slowest and hardest to use Analyzing raw times, I could see the effectiveness of each tool. Analyzing deviation, I could see that data as well as how well the tool worked for that person.</p>	
Summary Statement This project analyzes the effectiveness of three virtual navigation devices in a virtual 3D world.	
Help Received Father consulted on programming questions and suggested analysis techniques; mother helped organize tests.	