



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

<b>Name(s)</b> <b>Naren G. Kolli</b>	<b>Project Number</b> <b>J1411</b>
<b>Project Title</b> <b>The Effect of Natural English on Commanding Robots</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The problem to be solved is the difficulty of programming. As new technologies arise, it is becoming harder for the general population to program, as there is a learning curve. I aim to solve this problem by writing a program enabling a user to program a Mindstorms NXT robot using English commands. <b>Methods/Materials</b> Materials for the project can be divided into mechanical and virtual materials. The mechanical materials included the Mindstorms NXT robotics set and a Dell laptop with Windows 7. Digital materials software packages had to be installed: NXT-G, Bricx CC, Easy-Gui, and Python software. To create the program, I first sketched frameworks. Then I created a graphically based program that would translate English commands to executable code. After many tests, the prototype was complete, analyzing 126 keywords. Testing the prototype, I looked to see if it interpreted the command correctly, and looked to see if the command was translated to Bricx, and then to NXT. I also looked for kinks in the program, and how to make it faster or more intuitive. The prototype was tested 15 times for each factor. For testing intuitiveness I brought programming novices to test the program. The program was redesigned three times, before it was released. Qualitative measures were taken to see if the commands were analyzed correctly. <b>Results</b> From testing the prototype it was found that the Hermes program translated English commands into NXT code. When the prototype was created, all 126 keywords were tested and they all passed the tests. After redesigning the program, the software was more user friendly, simplifying programming. Another main result found was that if two different commands relatively meaning the same action were entered, the program would execute the commands the same, because of the framework mentioned before. <b>Conclusions/Discussion</b> In conclusion, the Hermes Program prototype simplified programming and translated English commands to NXT code. The program also met every design goal, by having an intuitive interface. The simplifying of programming could bring robots into a practical use at home, and bring more people into STEM fields.	
<b>Summary Statement</b> This project aims to simplify programming by translating natural English commands to executable code.	
<b>Help Received</b> Ms. Andrea Thomaz from Georgia Tech mentored me on the user experience and intuitiveness of the program. My father taught me basic programming, and my mother helped me create the display board.	