Recommendation for Project Continuation

Examination of what we have accomplished this year, and the research that has been done on other technologies leads us to make a few recommendations for project continuation. We recommend, first of all, to build a Nintendo DS redesign similar to the one that we have constructed, as we plan to give away the one we built. This design has the most promise for being simple and workable. Secondly, we recommend continuing in the technologies that have been researched already.

The most promising solution would be a far field infrared motion detection system. The basic concept of this project would be to detect the motion of the person’s head from a motion detector mounted on the television. Below is a diagram of a possible design.

![Optical Mouse Diagram](image)

**Figure 5.4 Optical Mouse Diagram**

First you would need to use an LED outside the visible spectrum, such as those used in a TV remote control, which operate at 920 nm - well outside of the visible light spectrum. This would then be reflected off of a piece of metal attached to a person’s head. The light from the LED is then reflected back to the optics system. This would be the most difficult portion of the whole task and where the project could encounter hold ups. This would then be read by the sensor and translated the exact same way that the mouse registers a change in direction. The reason this would be a viable option is because you would not need great accuracy. Once the information was collected from the motion sensor it could then be ran through a program in a PC. This would break all movements into nine different quadrants. This would create eight different commands with the center quadrant being a dead zone, protecting against unwanted commands due to small head movements. This same design principle could also be accomplished with the gyroscope idea, but is the only realistic option for this layout. Advantages of this design would be less bulk on the head and a possible low production cost. The major disadvantages are accuracy and range. A for this design concern would be the ability to build an optics system.

A second technology that would be worth exploring is a foot pedal implementation. This would consist of either an optical mouse being driven by one’s feet, or buttons that would be pressed by a person’s feet. The optical mouse could use the quadrant system explained previously for 8 commands or for direction. The buttons could be function buttons or direction buttons depending on the dexterity
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and needs of the user.

After researching these and other ideas, we would have to conclude that it would be worth it to go forward with the far field infrared motion sensor. I also would recommend going forward the foot pedal implementation. Used in conjunction with the current project, both of these designs would be viable options to replace a video game joystick.