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EE 476C

12/08/2017

Go baby Go (Wild Thing)

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Dr. Cole Galloway

Physical Therapist

Director of the Pediatric Mobility Lab and Design Studio

Dear Dr.Cole Galloway

In appreciation of your efforts to support innovation, the project, Go baby Go (Wild Thing), aims to have a customized/special wheelchair for the disabled children who cannot move around by their own. Following the specifications of the project, it is vital to note that the children with limited mobility hardly receive the crucial exposure to socialize with their fellows. In this

regard, the Wild Things project will establish a laser tag design and have that fun theme designed to enhance the service provision of the Wild Things.

Sincerely,

Abdallah AlSharrah

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Go baby Go (Wild Thing) – Design Review

Project / Problem Definition

The number of children either born with mental problems or acquire such conditions as they grow is increasing in the world today. For instance, conditions, such as spina bifida and Down syndrome render the victimized children immobile in diverse contexts. Such children also experience mental, social, and emotional development hitches, which interferes with their cognitive development besides the challenges. It is important for those children to have a platform, provided by technology, where they can also play, interact, move, and explore their surroundings fully. The Wild Thing comes in handy in this project as it offers that platform and bridges the gap by allowing the children to explore their surroundings despite their physical inability. More so, the mental, social, and emotional challenges that children with disabilities experience need special attention from not only healthcare providers but also with regard to technological innovations (Druin 46). Such technologies can promote physical and social exploration of the world. Furthermore, the need to fill this gap prompted the need for such a project meant to design and establish a gaming system using a real world mobile platform. In actual sense, the project will need a mobile phone or a notebook computer to promote the thematic “Wild Things.” The goal of this project will be to design and build a new version of the GBG retrofits specifically to design a universal control for children with limited mobility.

General Research Survey Results

Research indicates that disabled children lack enough autonomy and facilities to play, move around and exercise their freedom when it comes to cognitive development. In this regard, a gadget or movable wheelchair that has special and customized features to address such challenges can help and increase the cognitive growth of such children in diverse aspects. As

mentioned before, there are many children around the world struggling with limited mobility disabilities with such conditions as spina bifida and Down syndrome. The Wild Things project intends to bridge this gap by offering a “machine” controlled by an app that will coordinate the minds of such children and give them the much-needed platform (Mobility Management 1).

Upon survey, it was found that there is a more creative and cost saving or efficient way of solving the immobility problem among the disabled children. This technology was the design and implementation of the Go Baby Go (Wild Things), which uses a structured app to control the entire system. Evidently, toys are cost effective ways of allowing children to move and interrelate with one another while playing. Nonetheless, such children are also limited in terms of other movements that some technological provisions can offer. In this regard, the current designs of go-baby-go gadgets are based on an on/off mode of movement where the on button allows the car to move and stop instantly; however, this can be improved for better services. There have been little changes to the original design. The team seeks to design a more effective and better performing go-baby-go design.

Similarly, noting down the key features needed when researching ports or software is important (Druin 98). For instance, this project will ascertain features that are compatible with other components of the device. The second important feature is to look for software that can aid bread boarding and wiring. Moreover, the software should aid debugging. When put in place, such devices will ensure that the prospected gadget serves its purpose fully despite the challenges.

Project Level Design Specifications

For this special wheelchair to address the problems that disabled children face, it will adopt several modifications that are fully controlled by the app. Specific features will focus on the wheelchair’s armrest to ensure comfort, operability, and durability of the machine.

Work area Length. This armrest specification will allow the user to have an ample space to operate in. In addition, the stature can be modified with an arm bolster from the back of the seat to around three-fourths of the seat.

Full Length Armrests. Adding a specified armrests can enhance how arms move from the back to the front of the seat and they have a settled tallness, a specification that will ensure that a settled and a removable armrest is put in place.

Swing Away Armrests. From investigations, it is evident that such an armrest can be ideal for simple exchanges since the armrest swings back behind the seat and to the side.

Tubular. This armrest is cushioned for solace and flips down or bends descending for comfort.

Space Saver Arm. This armrest will allow the users to operate the machine near the arms because of its internal bend. These cars have shown to be a cost-effective means of enabling young children to move and interact with their peers. These cars, though very effective, have missed the mark for older and more able children.

Project Break Down.

The project explores a better way to establish power mobility to young disabled children with mobility problems. It strives to ascertain that even the nominal pediatric power wheelchairs serve the littlest users. The project will have systems:

Frames. The frames of the Wild Thing will be made of strong by light-weight metal pipes that allows it to move without much weight in its wheels. The light-weight pipes can also be covered with noodles to insure the safety incase of crashes.

Batteries. The batters will be enhanced in terms of voltage and durability to ensure that more power is relayed to the system and enough “idling” time is allocated for the wheelchair. Overall, the batter will be of high quality.

Seating. Using specialty design, the seat will be installed to best suit children from the age of 2 to 5. In addition to insure the comfort and safety of the children the seat will have a special back rest material and have a seat belt that hugs them to the chair while there on the wild thing adventure. The Wild Thing will still have proper functionality and controls (Mobility Management 1). Overall, the modified gadget will serve children of various sizes.

Kind of Motor to Use. It will use an electric motor, which can also use a direct current motor. Nonetheless, the batteries will be rechargeable, which means that new motor will have to use both sources of power (AC and DC).

Operating System. The operating system that the gadget will use is KeyKOS, initially designed IBM S/370 mainframe. The OS has an automated app data with limited operability challenges.

Sensors - For Stopping the Car from Crashing and Programing it Using Arduino

The type of sensor to use in the Wild Things will be the **Infrared (IR) Transceivers**, which is an Infrared light emitting diode (LED). It relays a beam of IR light, which upon finding an obstacle at a close proximity, is reflected back to an IR receiver and the car stops instantly to avoid crashing. The sensor will then continue emitting signals as long as the obstacle is still present. To have the IR Transceiver sensors installed and running in an Arduino, it will be uploaded in an Arduino embedded app/software [also called sketches] connected to a microcontroller. Arduino has Integrated Development Editor (IDE), which is easy to utilize for the development of sketches plus board uploads.

Joystick - Connecting it Using Adruino Programming System

Joystick will be used as the main controller of the Wild Things toy. In this case, the joystick will have two potentiometers, installed in Arduino, which measures the stick's movement in a 2-D platform. Potentiometers are variable resistors acting a as sensors providing variable voltages

that depend on the rotation/movement of the device on its shaft. Arduino programming system will be connected to a microcontroller that operates the joystick.

Game-The Wild Thing.

The gaming part that will be connected to the platform, we'll use laser tag game. So the kid will play laser tag with his parents or friends. The kid will control the red laser diode to aim the target that connected on the parents or friends, also there will be a target on the platform so other party can aim the platform as well. There will be laser sensors on the targets, when the laser come through the target it will produce sound, and we'll program the sensors using arduino-programming system. We chose the game because the kid can socialize and interact with other kids and move freely using the platform. And since we're working for wild thing theme, we believe that laser tag is pretty wild game.

Subsystems 1 to 3

The subsystems that will help in this project, for a successful implementation of the Wild Thing, is the Start Function, Connectivity Systems, and Cloud Computing for automotive motor. Thus, noting down the key features needed when researching ports or software is important. When the 3 subsystems are put in place, the device will serve its purpose fully despite the challenges.

Three Possible Approaches / Solutions

One solution is to have a stronger batter will an internal "powerbank" that can store energy for at least 24hours when the gadget is working. Another solution is to install a KeyKOS operating system to synchronize the functionality of various parts of the machines. The third solution is to have a removable seat, when designing the machine, which can allow for change of better or bigger seats when operating the machines.

Design Review Conclusion

The engineering work in the Wild Thing (Go Baby Go) has ensured that the mobility of the pediatric wheelchair is enhanced, safety improved, and comfort increased. By design, the product

has a sitting space, a backrest, armrests, a motor, and a computerized system with a KeyKOS operating system, which controls its movement from one place to another. As the wild thing design the go baby go laser tag game and adventurous theme. This design is a critical development meant to give a proper workability and an engineering touch to most of its parts. The movable parts are synchronized with the motor system to ensure that only the controlled signals can trigger the gadget to move around, which gives the children with disabilities a good platform to explore their surroundings.

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