<23> Automations for ABLE Alliance: Intro

https://sites.gatech.edu/gtablealliance/

Mentor Name: Will need TA Approval

Mentor Email:

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Abstract: To plead the need, first some background. ABLE Alliance at Georgia Tech: Dedicated to fostering a more inclusive & supportive environment for individuals of all abilities&disAbilities within the GT community. In terms of relating the outline of this project to the ABLE Alliance, the suggested project is set focused on enhancing the HRQOL for its president, Trey Quinn, who faces the challenges posed by cerebral palsy. Trey's unwavering determination and ambition to succeed make him an inspiring figure within the organization, but there are some aspects of his daily life that require assistance due to his condition. This project aims/attempts to best of ability to create a transformative environment through the implementation of advanced sensor tech. that will not only improve Trey's day-to-day experiences but also serve as a somewhat beacon of inspiration for the entire ABLE Alliance community. So in simple terms,

integrate smart automation systems into Trey’s immediate environment, leveraging cutting-edge sensor technologies with respect to the manual task that we try to automate to streamline those tasks that would otherwise consume precious time/effort (this is respective to the cerebral palsy condition Trey has). The advanced sensors & its propositional use details can be detailedly explained in another doc.

Articulated Problem STatements:

Consider in private space/solitude:

a. Assisting with Immediate Needs: addresses the challenge of assisting Trey with tasks that are typically quick and straightforward for most people but can be time-consuming for him due to his condition. It aims to provide quick responses to his basic needs, such as hydration, restroom visits, and hunger, by using capacitive touch sensors on his wheelchair.
b. Enhancing Awareness: By incorporating camera modules, the system helps Trey recongize presence in front of his private room, which then activates the data sent to a storage album
c. Metal-Aspect Capacitive Sensors: These sensors, strategically placed on the wheelchair's metallic elements, enable Trey to control various aspects of his entertainment and communication, such as adjusting the television's audio or opening his most-visited websites, offering him a greater degree of autonomy.
d. PIR Sensor and LCD Display: : The PIR sensor detects motion in front of Trey's occupied space and communicates his preferences or thoughts via an LCD display. This feature provides Trey with a non-verbal means of expressing his desire for privacy or engagement, fostering a more inclusive and respectful environment.
e. Photoresistor and LED Lighting: Ambient light conditions are continuously monitored using a photoresistor, which in turn adjusts an LED light conveniently attached to Trey's wheelchair. This not only illuminates his surroundings but also serves as a visual indicator for others, signifying his presence in a dark room. (in case of light outage)

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Notification/security handling via server programming&sensors to caregivers during solitude

Low-cost implementation and replicable

Summary Video: <Add link to prerecorded video here> After speaking to TA, this is not required.

Preliminary Requirements: none

Deliverables: fixated design set on wheelchair with the proper technology assembled with portability. Environment equipped with sensor&set mounting

Skills Required (or should be interested in learning):

Microcontrollers, Server&Port programming ,Arudnio&Python Programming,Proof of concept will include dealing with passive infrared hcsr501Sensor ,LCD Display, metal-Aspect Capacitive Sensors, Photoresistor and LED Lighting (Arduino ASX00010): maybe potentiometer tweaking,HG-C1030 ultrasonic. AutoCAD&3D printing. Intermediate friendly

Links to Resources: (Optional)

https://sites.gatech.edu/gtablealliance/

https://www.ajc.com/education/get-schooled-blog/georgia-tech-grad-students-with-disabilities-can-improve-campuses-for-all/RAJEJZDM3JGD7I6WNMAV6ANTUY/

https://www.verywellhealth.com/cerebral-palsy-coping-support-and-living-well-4160517#:~:text=Exposure%20to%20a%20different%20environment,places%20that%20accommodate%20one's%20abilities.

https://www.alibaba.com/product-detail/High-Quality-Quality-Long-Range-Distance_1600918694002.html?s=p

Existing applications:

Multiple teams allowed: Yes/No

If Yes, how many:1

Q&A: