ITSP 2015(revised)

TEAM MEMBERS

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PROJECT DETAILS

We will be creating a mechanism that will help a user to locate a particular book in a library (in a shelf for a prototype).

The software component we intend to make in in openGL

Software component will include a database that will store the names and locations of the books in a line (as our first initiative) and then in a grid(2d view).

The data will be stored in an array of objects of the type-class bookinfo(example)

For the mechanical part-

We are planning to use rail mechanism (rack and pinion), we wont be able to use robotic arms as they wont be able to handle the weight of the books plis the rack and pinion rail mechanism will be very fast and efficient as we want to make the book searching time very small.

As the rails and motors will only have to move the sensor that will scan the books , it can become very fast.

Image processing part-

This part is actually not necessary because we can directly use the barcode scanners which take a mere second to scan but we want to implement it on our own as we want to learn and this is the perfect opportunity to learn .

If we use image processing and implement it on our own. We will be using stickers instead of barcodes (stickers such as labeling alphabets or numerals or the book name itself) by pasting them on the back of the books and using our own small camera(or any other device recommended by our mentor) and we will make stickers on our own.

FINAL IMPLEMENTATION PART 1

For the first part we are planning to make it a very basic searing mechanism-

The books will be of equal width and thus each sticker(or barcode) will be kept at a known distance from the origin of co-ordinates , tus our sensor will know how far to travel before stopping and making the scan, if the scan matches the book entered by the user , then a torch will be lit.(in this design it will scan all the books from the origin)… we know that this design is inefficient and we will try to improve it but that are the details of part 2.

FINAL IMPLEMENTATION PART 2

So week two involves a little complicated stuff

We will try to use memory implementation-

This will work as follows-

After a few scans of the entire shelf the sensor will kno which book is placed where (at which position) from the origin . if the user now enters the books details the sensor will directly go to the position it thinks the book is … if the book is not there , then it will scan the entire shelf to search for the book(this method can reduce a few redundancies and make the project more efficient)

Please note

The rail mechanisms were done in a previous year itsp project . we were told this during the brainstorming session .. that is why we thought the project could be feasible

Below are the details about our work

For designing the user interface

We can use sdl or stfl (graphic packages) or even use use simplecpp as the user inter face is not that a difficult part to handle (my teammates and i know how to use sdl ,stfl.c++)

WEEK 1

TO GET THE NECESSARY ELECTRICAL EQUIPMENT LIKE ARDUINO,IR SENSORS

TO GET THE NECESSARY MECHANICAL EQUIPMENT LIKE RAILS AND MOTORS ON WHICH THE SENSORS CAN TRAVERSE.

TO LEARN THE BASIC PROGRAMMING LANGUAGE THAT WE WILL BE USING FOR CODING.

WEEK 2

TO SET UP THE MECHANICAL EQUIPMENT ON A PARTICULAR SHELF FOR THE SENSORS.

TO START THE BASIC CODING OF IMAGE PROCESSING THAT WE WILL BE REQUIRING IN THE PROJECT AND TRYING TO MAKE SURE THAT IT CAN READ AND PROCESS A PARTICULAR ALPHABET.

WEEK 3

TO TRY OUT THE IMAGE PROCESSING CODE WITH A FEW BOOKS AND TO SEE IF IT WORKS.

TO SET UP THE FINAL MECHANICAL RAILS AND MOTORS REQUIRED AND TO PLACE THE SENSORS SO THAT THEY CAN MOVE ALONG THE SHELF

TO TRY TO READ AND STORE ATLEAST 10 BOOKS IN AN ARRAY THAT WE WILL CREATE

TO BUILD UP THE NECESSARY USER INTERFACE REQUIRED

WEEK 4

TO SEE IF OUR DESIGN CAN SEARCH THE BOOKS OR NOT.

IF IT CAN, THEN WE WILL TRY TO MAKE OUR DESIGN SMARTER AND MORE EFFICIENT USING MEMORY IMPLEMENTATIONS

COSTS

THE RAILS AND MOTOR (Rack and pinion)

THE ARDUINO

CAMERA

MISCELLANEOUS THINGS: ICs wires, Torch for denoting where the book is located.