Library Assistance Bot

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Problem Statement

- Lot of manual work in arranging library.
- Incorrect placements of books.

Functional Requirement

- Robot will place the returned books in the correct location.
- Detect the books placed in the wrong location.
- Correct the position of misplaced books.

Functional Requirement (cntd.)

Robot will go near the book.

The bot will orient the book properly.

The bot will read data from the book using *QR Code.*

This data is then processed using *Scilab.*

Then the bot will first locate the proper position of the book.

It will place the book there and return to the default position.

Non-functional Requirement

- Additional Hardware
  - Robotic Arm to pick, orient and place the book.
  - Zigbee module for wireless communication.
- Additional software
  - QR Code reader
  - Scilab
- Support needed from lab
  - Interfacing hardware with bot.

Final System

- It detect the color on the book with the camera and hold the book
- Detected color is processed by image processing and library number corresponding to book is sent by wireless communication (Zigbee)
- When Bot got the Library shelf number it follows the path of Library and places the book in corresponding Library shelf

Problems Encountered

- Hardware Constraints
  - Camera was not able to give exact pixel value for the QR code
  - Robotic arm provided was not movable so it was very difficult to have more than one partition in the shelf
  - The bot was not accurate for example we need to rotate 78 degree for 90 degree rotation
- Software Constraints
  - First we tried QR code reading library ZXING on MATLAB (Compatible with MATLAB not SCILAB) but camera was not giving so good result then we switch over to image processing but then due to time constraints we did not use SCILAB
  - We started with esterel but Bot was giving different measurements so we switch to C code

Future Work

- Book issuing can be done
- There can be master Bot which will monitor the slave Bots

Thank You!