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LITERATURE SURVEY ON LIBRARY MANAGEMENT ROBOT

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Abstract:

The library management and books picking robot would describe a system designed to automate library operations, enhancing efficiency and user experience. This innovative solution integrates robotics and software to organize, locate, and retrieve books. The robot utilizes advanced algorithms to navigate through open cv using cam, identify book locations, and pick requested items. The library management aspect involves a comprehensive software platform for cataloging, tracking, and user management. This integrated approach aims to streamline library tasks, reduce manual efforts, and provide patrons with swift access to desired books

Keyword: Rasp berry pi ,robotic arm ,cam module, barcode scanner, ultra sonic sensormo ,

motor driver

I.INTRODUCTION

The Library Management Robot marks a significant leap in library automation, revolutionizing traditional book retrieval systems. This cutting-edge technology combines robotics and software to create a seamless and efficient process for managing and delivering library resources .In a world where information is at our fingertips, libraries are adapting to meet evolving user expectations. The Library Management Robot is designed to enhance the overall library experience by addressing common challenges such as time-consuming book searches and manual shelving processes .due to increase in number of shelves in the library it is difficult for a single person to remember such a large records. difficult to search records when there is no computerized system, if the books are large number. Picking books from the counter or reading table to respective shelf. This robot is used to pick the desired book in the shelf. If any object will appears means the robot will be stop or it will change the direction and the robot will scan the desired shelf where the instruction given by user. From advanced navigation algorithms for precise book location to a user-friendly interface facilitating seamless requests, the Library Books Picking Robot is poised to transform how libraries function in the digital age. This can be used as package tracing and picking system.

II.LITERATURE SURVEY

- Automated Library System using Robotic Arm (2019). K. V. Jyothi Prakash The main objective was to overcome the problem of searching the books in the library and provide automation in a user friendly manner. The robot with an arm is designed which can search the required book, pick the book from the rack and deliver the book to the issue counter. It can also place the book in its designated slot once the book is returned by the borrower. The hardware and software required for automated library system using robotic arm has been designed

- Design and Development of IOT Based Smart Library using Line Follower Robot.(2020) Gupta, T, Tripathi, R. Shukla, M. K. and Mishra, S. The purpose of the Smart Library system is to provide the details of a large number of books, magazines, journals, these is and allow the administrator/Librarian, staff or students to search, borrow and return facilities. This system will reduce the time required for a task like issuing and returning the book as it reduces the human interception and uses electronic and mechanical automation in place of that. Executing this system in central libraries will help many readers. Various privileges are accorded to different user types. For librarian staff, the robot is accessible through voice commands as well so that it can help the staff in managing and maintaining the library properly. While the readers can access it through the web database for getting the details of their account and can opt for issuing or return a book though it without going anywhere.
- DESIGN AND DEVELOPMENT OF LIBRARY ASSISTANT ROBOT(2015) Ranjani.R, M.Nandhini, G.Madhumitha New techniques are being made suitable for improving and making library service effective to the user community as the manual service is time consuming. Using computer networks for resource sharing, enables library to obtain only bibliographic details from the library‟s collection, but to handle the materials, the designed robot assist in locating the position and collecting the material from the section of rack. The designed assistant robot is efficient in handling the book and is reliable to be adopted in library.
- Library Assistant Robot Robots in Library Management System(2017).Deepthi Unnikrishnan, Aswani C R, Arjun K Jayaprakash, Ganesh S The robot end consist of a line follower robot which works with ATmega328 microcontroller. The input is given using a matrix keypad. The name of the book is displayed in LCD. The RFID card reader scans for RFID tag placed in each book and the RF transceiver used to communicate between the two ends. The shelf end consist of three motors driven using a motor drive which is used to push the book from the shelf to the basket in the robot, all the control is done by the ATmega328 microcontroller which inter links with the other microcontroller using RF transceiver.
- Design and Fabrication of Library Management Robot(2023) .N. Venkata Surya Teja , Sai Seetha,G. Dileep Kumar, M. Chiranjeev Varma , P. Raja , T. Kodandaram6 K. Hari Venkata Manikanta ,M. Praveen Kumar , B. Usha rani , N. Suneel kumar, , In this project the proposed system give the result of find the book, Misplacing of the books can be identified easily. It reduces the manual work. With the proposed architecture, if constructed with at most accuracy, the robot will pick the book. It will act as a basic platform for the generation of more such devices for the book picking. This helps and simplifies the job of monitoring the arrangement of books and also reduces the manual routine. As development in Robotics is growing fast, we can make robot more autonomous and sophisticated .Also we can develop this system with real time camera implementation.
- Automated Library Robot (2020).Vedanti Kansara , Parthav Shah , Meet Shah , Meet Shukla4 , Avneet Saluja , Rahul Patel, , In this paper, we have proposed a technique for managing the books in library with help of robot. From the experimental results, managing books gets easier using minimal manual work. The proposed method does not involve any path constraints and is simple as compared to other techniques of path tracing. It gives the advantage of being platform independency. This robot unit is flexible and can be applied to any library. This can be employed as an initial process of automating all manual work at library
- The UJI Librarian Robot(2008) Mario Prats, Ester Martínez-Martín, Pedro J. Sanz and Angel P. del Pobil, The system

has been tested, and experimental results show how it is able to robustly locate and grasp a book in a reasonable time without human intervention. On-going work

- Advanced Library Management System (2023)Vinod Bhat , Rahul Gaikwad, Manjiri Tare, Dipali Gharate, Martina systems are essential tools for modern libraries to effectively manage resources, engage users, and encourage lifelong learning. They provide increased efficiency and accuracy in library operations, greater resource use, improved user experience, and data-driven decision-making. However, they also require careful design, implementation, and continuing maintenance. To ensure the success of Knowza.io, libraries must ensure that the system is linked with their objectives and goals, that staff members are educated to use it successfully, and that it is updated and maintained on a regular basis to guarantee its dependability and security. Additionally, users must be able to access library resources, browse for books, request materials, and renew borrowed things using online portals.
- Automated Library System using Android Based Robot(2019) B.R.Sathishkumar, M.Krishnaprabha, S.Priya, M.Ragavi, , This system provides an automated and improved library system. It simplifies the manual work done by a librarian to issue a book. This proposed system will provide an easy and efficient way to search the books. This makes the library system more reliable. This system also easily finds the misplacement of book. The book search software is designed in My SQL platform. Besides the book searching system this system also provides an easy way for book retrieval. This can be done with the help of RFID tags and RFID reader. This system makes the students to take the book and return the book without the help of librarian. The replacement of book mechanism reduces the search time and manual interventions. This System uses cloud for storing the book databases. The searched book details are retrieved from the cloud. Using GSM technology the date in which the book has to be returned will be intimated regularly to the user. The approached system is also helps to lessen the power utilization in the library. Using mobile application the presence of the book in the library can be identified without going to the library.
- ,AUTOMATED SMART ROBOT LIBRARY MANAGEMENT SYSTEM (2020)Chaithra S, Sweety Kumari,Preethi Kumari, A design of providing a sound mechanism by automated the process of searching the book it saves time of both the librarian and the student. No need of librarian to keep track of all the books. Thus it reduces the librarian stress and human errors. This makes the management of library Simple, Easier and maintenance of library is becomes cost efficient. As mentioned earlier this which we have presented is just an prototype which shows the idea that we have implemented. In future we would make the following modifications to our design. Using of Barcode Reader instead of RFID tags and RFID readers since the Barcode is easy to implement in the books. The robot can also be used as Pick and Place Robot in any of the other fields.

III.Drawbacks Of Existing System

- Due to increase in number of shelves in the library it is difficult to Robot to search the books .

IV.Objectives Of Proposed Method

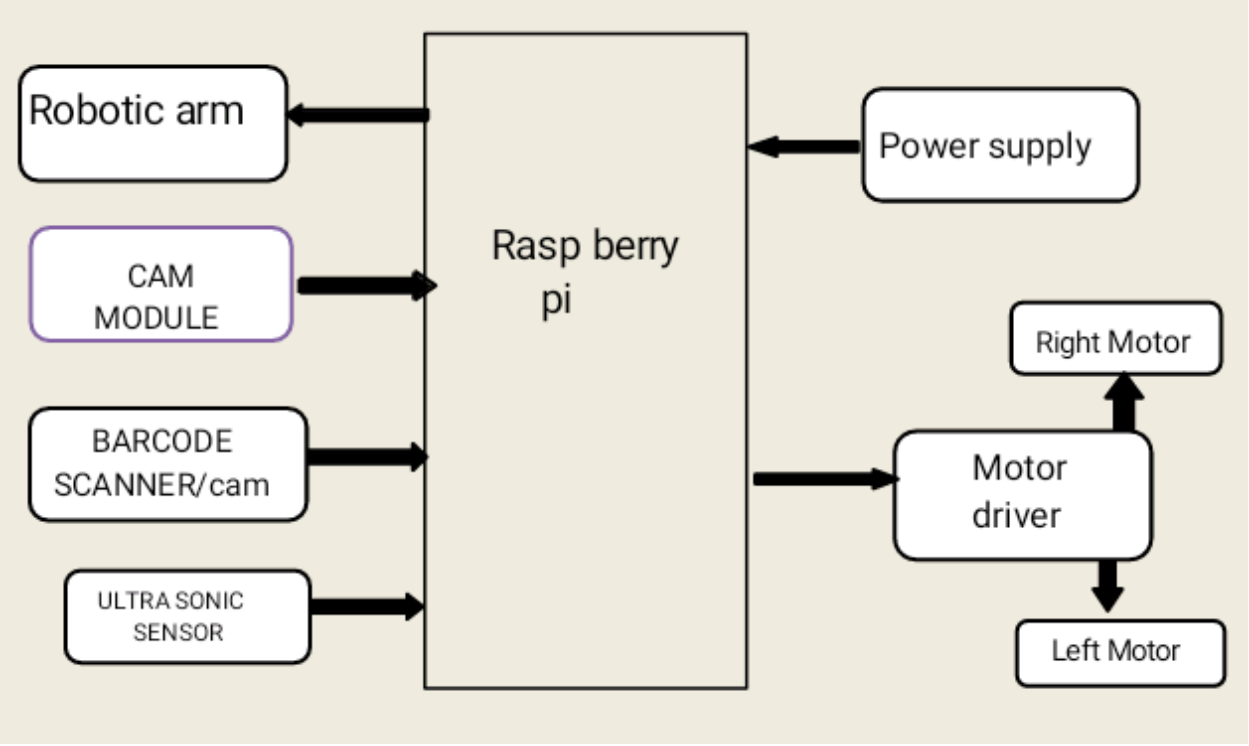
The instruction where given by the user to pick the desired book in the shelf.

When instruction received from the user the robot will analyse if the book is present or not if the book is not present means it will display book not fount if the book is present means the robot will start to search the shelf using the cam module. After reaching the shelf the robot used to search the book ,when the desired book matches

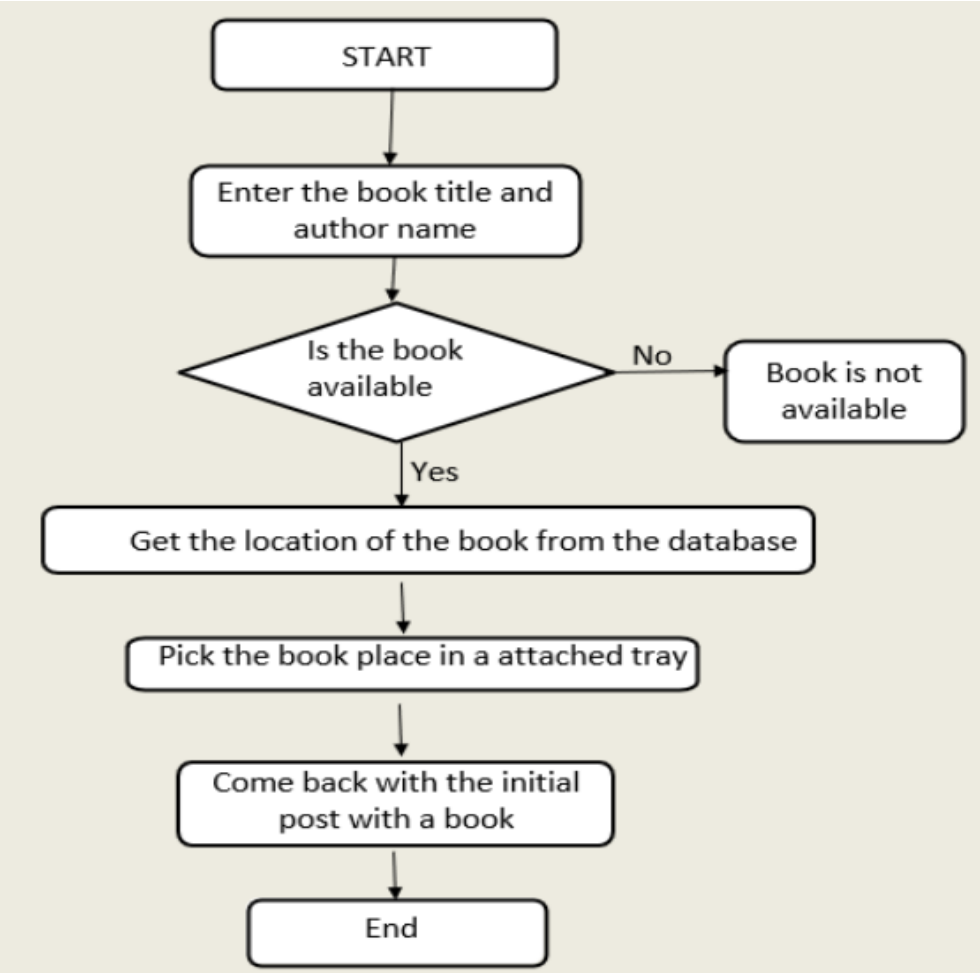
means the arm used to pick the book and place the book in cart. After picking the book the robot will return to the user, when there is no books matches means the robot will return to the user and it displays no book found. This robot will runs in the desired maze.

V. PROPOSED METHOD

In the library management robot the instruction is given by the instructions given by the user in the computer and the rasp berry pi receives the instruction from the user and the rasp berry analise the given instruction the robot will check the book is present in the library or not if the book is not found means the robot will send the instruction to user the book is not found if the book is matched means the robot will start and the robot will move to words the shelf and the robot will start to scan the all the books in the shelf if the book matches means the robot will grab the book in the shelf and place in the cart and the robot will move towords the use and the book where updated in the library hub.



a) Fig 1. block diagram



b) Fig 2. flow chart

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