LINEAR CONTROL SYSTEMS

PROJECT PROPOSAL - SPRING 2024

*AUTONOMOUS HUMAN FOLLOWING TROLLEY*

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# PROJECT IDEA:

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| This project proposes the development of an innovative Human Following Trolley aimed at revolutionizing the shopping and material transport experience at various environments, such as supermarkets, shopping malls and industrial settings. The Human Following Trolley will be integrated with ultrasonic sensors and vision-based recognition systems to maintain an optimal distance from the user, enhancing user convenience and operational efficiency. The project’s primary objective is to reduce the physical strain and time expenditure for users by providing a hands-free, reliably following trolley. The project represents a significant step forward in integrating robotics into human-centric services, contributing to the advancement of smart automatic technologies.  **WORKING:**  The Human Following Trolley will utilize a combination of ultrasonic sensors, accelerometer and gyroscopes, machine learning algorithms and robotics to autonomously follow users.   * **Ultrasonic Sensors:** ultrasonic sensors play a crucial role in the distance measurement of the Human Following Trolley by emitting high-frequency sound waves. These waves reflect off objects and return to the sensor, where the time delay of the echo is converted into distance data. This continuous feedback allows the trolley to determine the user’s position. The result is a trolley that maintains a safe, consistent following distance, automatically adjusting its speed and path accordingly. * **Gyroscope:** the gyroscope in the trolley is integral for maintaining stability and orientation. It measures the trolley’s angular velocity around its axes, providing crucial data that helps in adjusting the steering mechanisms to keep the trolley correctly aligned with the user’s direction.   Together, these sensors ensure that the Human-Following Trolley operates efficiently and safely in diverse environments, enhancing user experience through advanced technology integration.  **BLOCK DIAGRAM:**    **CONCLUSION:**  The Human Following Trolley, equipped with advanced ultrasonic sensors offers a significant improvement in user experience by ensuring safe, efficient and autonomous navigation in crowded or complex environments.  Such kind of a technology is useful in:   * Supermarkets for hands-free experience * Airports and train stations for luggage transport * Hospitals and healthcare facilities for transporting medical equipment * Elderly and disabled assistance   This versatile application across multiple industries highlights its potential as a transformative tool for both everyday convenience and commercial efficiency. |