



Automated Felicitation Robot

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ABSTRACT :

The Automated Felicitation Robot is designed to handle the process of awarding items like certificates or trophies at events. Using AI, robotics, and advanced recognition systems, it autonomously identifies recipients and delivers items with precision. This solution streamlines event management, reduces human effort, and adds a modern touch while ensuring safety and efficiency.

The industrial and technological revolutions are accelerating globally as a result of the widespread adoption of new information and communication technologies like artificial intelligence (AI), the Internet of Things (IoT), and blockchain technology. Government, business, and academia are all paying close attention to artificial intelligence. In this study, a selection of well-read articles on artificial intelligence from recent publications is examined. The focus of this study is to offer an analysis of artificial intelligence using integrated industry information. It provides an overview of the extent of artificial intelligence using background information, motivating factors, technological advancements, and applications, as well as rational predictions for its future. This study can contribute to the field of artificial intelligence research and offer crucial knowledge to real-world practitioners. This study's key contribution is its clarification of the current state of the art in AI for further research.

Robotic Process Automation (RPA) has received growing attention within the digital transformation as this cutting-edge technology automates human behavior and promises high potentials. However, the adoption in purchasing and supply management (PSM) is still in its infancy and has hardly been explored, particularly in the public sector. Based on a multiple case study including 19 organizations of the public and private sector, this paper narrows that gap and presents comprehensive insights into potentials, barriers, suitable processes, and best practices and components for RPA implementation. The findings indicate that adoption depends on the organizations' digital procurement readiness and maturity.

INTRODUCTION :

In an increasingly fast-paced world, celebrating life's milestones can sometimes be overlooked. To bridge the gap and ensure that special moments are always acknowledged, the 'Automated Felicitation Robot' offers a unique solution. Designed to autonomously deliver congratulations and celebratory messages, this innovative robot is programmed to enhance both personal and professional celebrations with ease and creativity.

From birthdays to promotions, anniversaries, or other achievements, the felicitation robot can customize greetings, interact with users, and even sync with events to ensure no important moment goes unnoticed. With a combination of speech recognition, gesture animation, and multimedia engagement, it turns any celebration into a dynamic experience. The robot can be pre-programmed for various events, personalized to meet specific preferences, and integrate with social media or calendars for real-time felicitations.

By blending artificial intelligence with human emotions, this robot brings a futuristic touch to heartfelt congratulations, making every celebration memorable and automated!

Quality control in manufacturing has seen significant advancements due to the implementation of robotics and automation. Advanced robotic systems equipped with sensors and cameras are capable of inspecting products at various stages of the production process to ensure that they meet stringent quality standards. By identifying defects or inconsistencies at an early stage, these intelligent machines contribute to the production of superior finished products, ultimately enhancing customer satisfaction and loyalty.

Moreover, the integration of robotics and automation has fundamentally transformed customization in manufacturing. Flexible robotic systems allow manufacturers to cater to the specific needs and preferences of individual customers while maintaining high levels of productivity. These technologies facilitate the mass production of tailored products by swiftly adapting to changing production requirements. This capability for customization has not only expanded the market reach of manufacturers but has also opened up new avenues for business growth. Workplace safety in the manufacturing industry has significantly improved due to the implementation of robotics and automation. By assuming hazardous or physically strenuous tasks, robots have mitigated the risk of injuries among human workers. This not only decreases the probability of workplace accidents but also results in cost savings for manufacturing firms while promoting the overall health and safety of employees. However, while the benefits of robotics and automation in this

sector are evident, it is crucial to address the potential challenges and concerns associated with these advancements. Considerations such as job displacement, the necessity for retraining, and ethical dilemmas related to the deployment of autonomous machines must be thoroughly evaluated to facilitate a seamless transition to a more automated environment.

MATERIALS & METHODS :

Architecture: Here's an enhanced outline including the abstract, materials, methods, and architecture for an automated "felicitation" robot, a device designed to offer celebratory gestures, sounds, or messages autonomously when triggered by specific events.

Algorithms: Computers possess the capability to autonomously learn from and analyze extensive datasets through machine learning, subsequently utilizing this analysis to make decisions and forecasts regarding real-world events. The functionality of artificial intelligence is driven by algorithms. In addition to their application in AI-related tasks such as pattern recognition, notable achievements have been realized in various domains, including speech recognition, search engine optimization, semantic analysis, and recommendation systems. Each of these areas has experienced significant advancements due to the influence of AI algorithms.

Machine learning: The core principle of machine learning revolves around the utilization of algorithms that improve their efficacy through the assimilation of data. The primary challenges addressed by machine learning encompass prediction, clustering, classification, and dimensionality reduction. Machine learning can be classified into four categories based on the organization of learning methodologies: supervised learning, unsupervised learning, semi-supervised learning, and reinforcement learning.

Flowchart

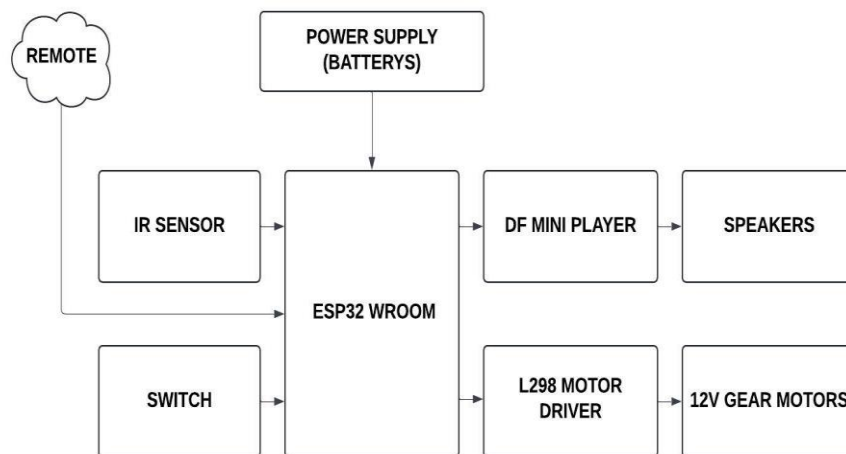


Fig. A) Flowchart

HARDWARE :

Creating an automated felicitating robot involves several key hardware components to deliver gestures, movements, and interactions appropriate for celebrations or ceremonies. Here's an overview of hardware requirements to build a felicitating robot:

1. Chassis and Structure

Base and Frame: A sturdy base with wheels for mobility or a stationary frame if movement isn't required.

Robot Arm: Articulated arms with servos to allow gestures like handshakes, giving flowers, or presenting certificates.

Display Screen or Face: An LCD or LED display for facial expressions, text messages, or video congratulations.

2. Motion and Actuation

Motors and Servos: Stepper motors for precise movements, especially if the robot has arms or wheels. High-torque servos for arm articulation.

Wheels or Treads: Omnidirectional wheels (if the robot is mobile) to move in any direction smoothly.

3. Sensors and Input Mechanisms

Proximity Sensors: Infrared or ultrasonic sensors to detect people nearby.

Touch Sensors: For handshakes or high-fives.

Cameras: For facial recognition to identify guests or respond to visual cues.

Microphones and Speakers: For voice interaction and felicitation speeches

4. Power System

Battery Pack: Sufficient power to support mobility, screen, and motor functions, depending on robot size and mobility.

Charging System: A docking station or wireless charging pad to ensure the robot is ready for multiple felicitations.

5. Computing and Control

Microcontroller/Processor: Like an Arduino (for simple tasks) or Raspberry Pi (for more complex tasks like facial recognition and voice interaction).

Communication Module: Wi-Fi or Bluetooth for remote control or synchronization with other systems.

Actuator Controller: Motor drivers or servo controllers to handle movements smoothly.

6. Decorative and Functional Accessories

LED Lighting: To create a festive feel or highlight certain gestures.

Gift Holders: A compartment or tray for presenting flowers, medals, or certificates.

Customizable Clothing/Props: Outfit or changeable accessories like hats or scarves to suit different events.

Example Use Case

1. Guest Detection: Robot detects a person nearby with proximity sensors and moves toward them.

2. Recognition and Greeting: Uses camera and microphone for facial recognition and speaks a congratulatory message.

3. Gesture Performance: Extends an arm or presents a gift/flower.

4. Photo Opportunity: Pauses and poses with the guest for photos

.Building such a robot involves integrating these hardware components with suitable software algorithms for interaction, recognition, and timing.

Software:

To develop the software for an automated felicitating robot, you'll need a system that manages interactions, coordinates hardware components, and provides customizable functionality for different events. Here's an outline of the software components required:

Operating System: If using a Raspberry Pi or similar, a lightweight Linux OS (e.g., Raspbian) is recommended to handle complex tasks.

Microcontroller Software: For simpler components like an Arduino, embedded C++ code can control individual actuators.

Middleware: Use ROS (Robot Operating System) or a similar framework to handle data transfer, sensor integration, and movement coordination.

CONCLUSION:

Automated felicitation robot offer an innovative solution to streamline award giving advancements in robotic and AI,these robots could become a common sight in public and private ceremonies, enhancing the efficiency, safety, and sophistication of such events.

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