MOTOR CONTROLLER USING SPEECH COMMANDS: HARNESSING THE POWER OF VERBAL INSTRUCTIONS FOR ENHANCED INDUSTRIAL EFFICIENCY

ABSTRACT:

Motors serve as the engines in many machines we use daily, such as cars and appliances, significantly enhancing our lives and playing a crucial role in technology and automation. Concurrently, speech is a natural and preferred mode of human communication, increasingly utilized for automating tasks. Speech recognition allows us to command machines simply by speaking to them.

The primary aim of this project is to employ speech commands to control motor operations. By issuing commands in English, effective motor control can be achieved without manual intervention, utilizing embedded systems and Python programming. The system integrates a USB microphone, DC motor, LCD display, Arduino Uno microcontroller, and a motor driver module. Its application extends to irrigation systems, particularly benefiting individuals with partial disabilities such as the visually impaired. An essential feature of the motor is its dual control capability, allowing both manual and speech-based commands.

The fundamental concept entails implementing speech-to-text functionality using Python on a PC to interpret spoken commands captured by the microphone. These commands are then transmitted to the Arduino Uno microcontroller via serial communication. Endowed with motor driver capabilities, the Arduino Uno adjusts the motor's speed based on the received commands, offering high, low, and medium speed modes, as well as clockwise and anti-clockwise directions. This project showcases the potential of voice recognition technology in automation and human-machine interaction by combining embedded systems with Python programming, presenting an innovative solution for intuitive motor control.

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