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Voice Enabled Smart Drone

Suraj Gupta[1], Ravi Maurya[2], Pradeep Yadav[3], Godavari Kedar[4]

Department of EXTC, Mumbai University, MUMBAI

Abstract**—***This Project is based on controlling drone (Quadcopter) with the help of the human voice. The voice data will be given by user with the help of mic connected to voice module. The voice module is used to take voice input from the user who wants to control or fly the drone. Then that voice data is processed in the voice module circuit and transmitted with the help of transmitter to the drone. The drone receives the data and perform the instructed action given by the user e.g. move left, move right, move up, move down etc. But before to get access to the flying mode the user needs to say the security code to get access granted, this helps to secure from the invalid users.*

Keywords—Voice control, Drone, Voice module, Flying mode, Voice data.

I. INTRODUCTION

Advances in science and technology are going fast now a days. The development in science and technology leads to the comfortable living for human beings. When the drone was invented, remote is used for flying the drone. The drone is one of the most complex areal system. A quad-rotor is propelled by four rotors using four motors. The clock and anti-clock wise direction of each motors cause the required torque, which enables the drone to fly. Precise spin of the four propellers, directional movements of a quad-rotor are achieved - Forward, Backward, Left, Right and Yaw. But controlling the propellers speed is not an easy task. It needs control expertise with proper control basics. Computer control Remote control are the traditional ways to control the propeller speeds. But computer control can lead to improper input typing and remote control needs proper co-ordination of fingers when it comes to flying the drone. The person who wants to fly the drone must have the proper knowledge of remote control. In remote controlled drone, the remote continuously transmits signal to the drone receiver. This continuous transmission of signal is needed to keep the drone stable in the air. So, it becomes very important that the person needs to have a well-developed flying skill for avoiding the crash of drone. To overcome all these problems, we have developed the voice-controlled drone. The voice control function enables the user to control drone with his/her voice.

II. RESEARCH PAPER

Speech control strictly avoids the above problems. It provides a smarter interface for quad-rotor control. With the advancement of speech technology, systems like the wheelchair, home appliances are using speech technology to provide an easy human-machine interface. If it is voice controlled means anyone can fly without any skills. Through this project, we can build a drone which can be controlled by the voice commands of the user. The voice command will be taken from the user and it will be processed in the voice module and then transmitted to the drone. The flight controller in the drone will receive the transmitted signal from the air telemetry and gives the signal to all four ESC's (Electronic Speed Controller) which is responsible for controlling the speed of the motor. There are different types of electronic speed controllers. Each controller is designed for a specific purpose; some are designed for high-speed racing, while others are made for stability in aerial photography applications. Based on voice command, the drone will be controlled. The project is particularly interested to assist people with physical disabilities, and it proposes to transform the drone into a hands-free device using voice control. Let the user control it uses her/his voice and incorporate a voice synthesizer to communicate the user relevant information and make it more human-friendlier.

There are many different types of speech recognition systems and engines, applications and interfaces. These includes voice controlled wheel-chairs, voice-controlled appliances using android phone or by Bluetooth module etc. But such systems lack the universality due to the dynamic nature of human voice. The commercial interfaces also effect the production cost. This work tries to discover the hidden issues of a speech-based control system and allows speaker to adapt his voice to the system. The dynamic

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nature of voice leads a speech system failure which may cause the failure of the control system as well. Speaker Adaptation helps to solve this issue which keeps the effectiveness of the control system even in a dynamic environment.

III. PROPOSAL METHOD

The transmitter part contains a microcontroller ATMega328 (Arduino Nano) which is connected to joysticks for manual, Voice Recognition (VR) module and power supply. To operate the drone with voice set the transmitter in auto mode by Auto/Manual select button, then set its mode according to user's choice i.e. Throttle, rudder, elevator and aileron. Power supply section have one rechargeable battery, charging module to charge the battery and a booster to boost the voltage from 3.7V to 6V. There is LCD display to display the voice command given by user.

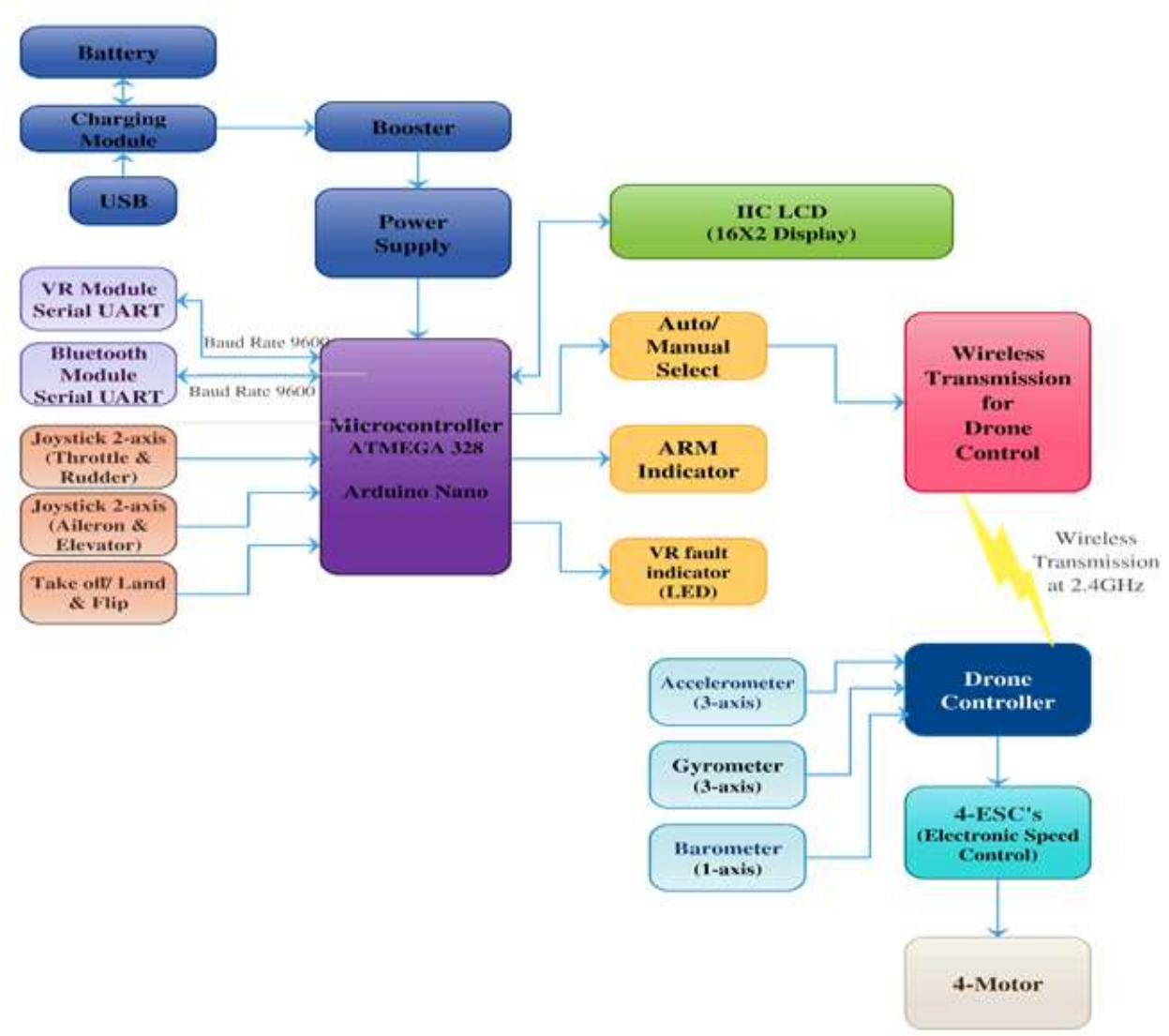

Figure 1: Block Diagram of Voice Enabled Smart Drone

The voice command is transmitted at 2.4GHz and baud rate of VR and Bluetooth module is 9600. Drone controller receives the signal from transmission unit and give it to ESC's (Electronic Speed Control) of drone. For take-off and land operation we use throttle, throttle controls the up and down axis by varying the overall speed of the rotors.

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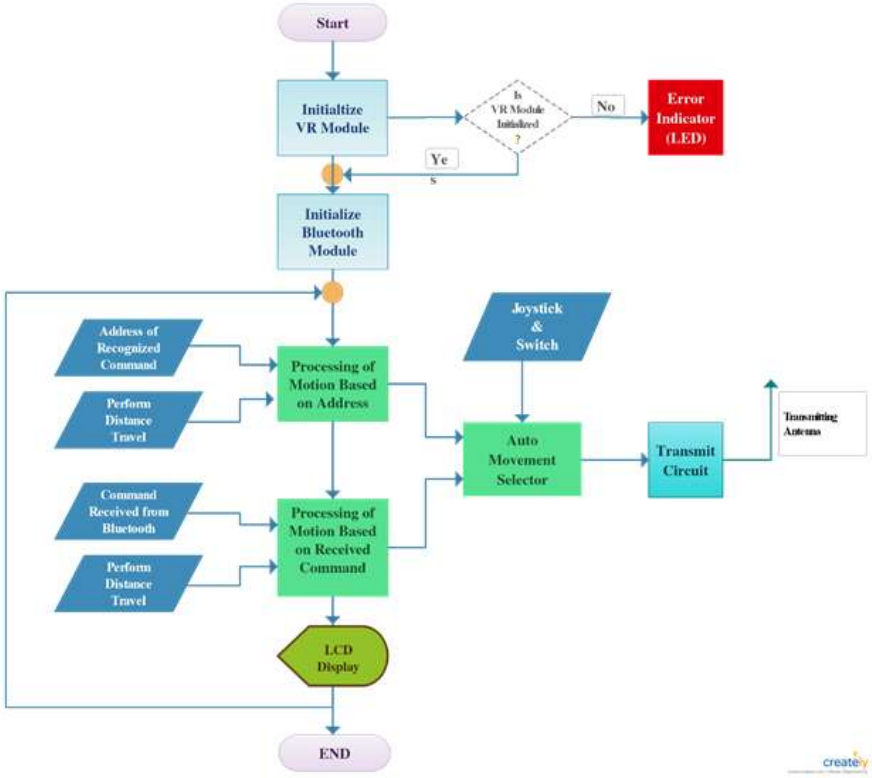

Figure 2: Flowchart of Voice Enabled Smart Drone

IV RESULT

The remote of drone is modified to voice control to take the voice as controlling input for drone and there is joystick also for any emergency or at the failure or any kind of issue takes place in voice recognition module. The designed remote is shown below. To fly the drone properly user should take care of their pronunciation or accent of the command, otherwise it'll not detect proper command. User can control the drone up to 60-80 meters by sitting at a place without using joystick.

Figure 3: Voice Enabled Controller with Mic and Display

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With the help of this controller user can give the command through mic and it displays on 16*2 LCD Display. Basically it contains 4 modules- (1) Voice Recognition module, (2) Arduino Nano, (3) Booster Module and(4) Charging Module.

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