

VOICE ENABLED SMART DRONE

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Abstract : In the era of smarter technology, human-machine interaction plays an important role. With the advancement of speech technology, it has come to human life with systems, robots and now in drone making all of them smarter. But a low cost, real-time and adaptive voice-based control system is still a dream. This paper tries to develop a voice-based control system based on open source reducing the production cost with zero maintenance cost. It uses speech recognition and applies control logics for controlling of a drone. It consist of smoke sensor that can detect fire & drone notifies that location to nearer fire brigade.

Keywords: Human-machine interaction, low-cost, real-time, adaptive, voice-based control system.

I. INTRODUCTION

The drone is one of the most complex areal system. A drone is propelled by four rotors using four motors. The clock and counterclock wise direction of each of the two motors cause the required torque, which enables the drone to fly. With precise spin of these four propellers, directional movements of a drone are attainable - Forward, Backward, Left, Right and Yaw. But the control for the propellers speed is not an easy task. It needs control expertise with proper control basics. Keyboard typing (computer control) or key pressing (Remote control) are the traditional ways to control the propeller speeds. But computer control leads to improper input typing and remote control needs proper coordination of fingers when it comes to multitasking for UAV. Speech control strictly avoids the above problems. It provides a smarter interface for drone control. With the advancement of speech technology, systems like the wheelchair, home appliances are using speech technology to provide an easy human-machine interface. Today, there exists different speech recognition systems and engines, applications and interfaces. These includes voice controlled wheel-chairs, voice controlled appliances using android etc. But such systems lack the universality due to the dynamic nature of human voice. The commercial interfaces also effect the production cost. human voice give command through android phones and control the drone. Also it consist of smoke detection sensor that detect fire and notifies to nearer fire brigade.

Motivation:

For a flying drone, people should have minimum knowledge of the flying skill then only they can able to fly properly without crashing, but it's not possible for all the people. If it is voice controlled means anyone can fly without any skill. Through this project, you can build a drone which can be controlled by voice commands. The voice command will be received by the microcontroller then it will generate the output signal. The drones are able to carry heavy loads over long distance while being controlled by voice commands. It has smoke detection sensor that detect and prevent from fire.

Problem Definition:

Design and implement voice enabled drone with smoke detection sensor which is used in emergency situation that detect fire and notifies nearer fire brigade.

II. LITERATURE SURVEY

1. Speech Recognition System. Moirangthem Tiken Singh, Abdur Razzaq Fayjie and Biswajeet Kachari. 2015 The paper concludes a speech-based control system for DRONE using Support Vector Machines.
2. Robot Operating System. Morgan Quigley and Ken Conley and Brian P. Gerkey and Josh Faust. 2009, The Paper Concludes ROS: an open-source Robot Operating System.
3. Speech Recognition Techniques Deepa H. Kulkarni 2013 The Paper Concludes speech recognition techniques.

III. HARDWARE SPECIFICATION:

Software Requirements

OS: Windows

Arduino IDE

Hardware Requirements: bluetooth module, Battery, Arduino uno.

Arduino uno

Arduino Uno is truly outstanding and easily programmable microcontroller board. It has fourteen digital input/output pins, a sixteen megahertz ceramic resonator, half -dozen analog inputs, an ICSP header, a USB connection, a power jack, and a reset button. It is programed using a USB cable connected to a computer. After programming it can also be used without the USB with the help of a battery. The Uno uses Atmega16U2 which is programmed as a USB-to-serial converter. Its operating voltage is 5V.

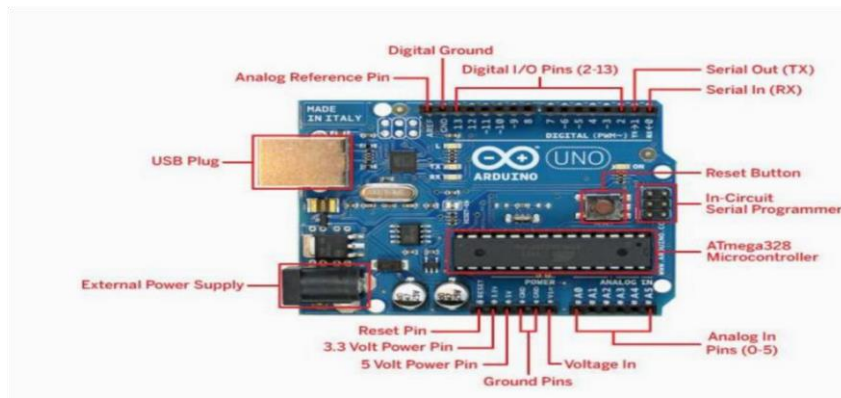


Fig.1 Arduino uno

Sensor

A smoke detector is a device that senses smoke, typically as an indicator of fire. Commercial security devices issue a signal to a fire alarm control panel as part of a fire alarm system, while household smoke detectors, also known as smoke alarms, generally issue a local audible or visual alarm from the detector itself.



Fig.2 Smoke sensor

DC motors

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor. DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings.

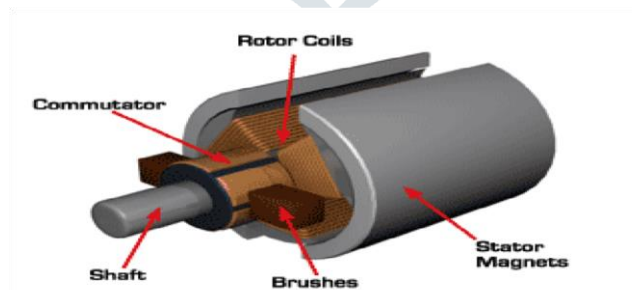


Fig.3 DC Motor

IV. PROPOSED SYSTEM

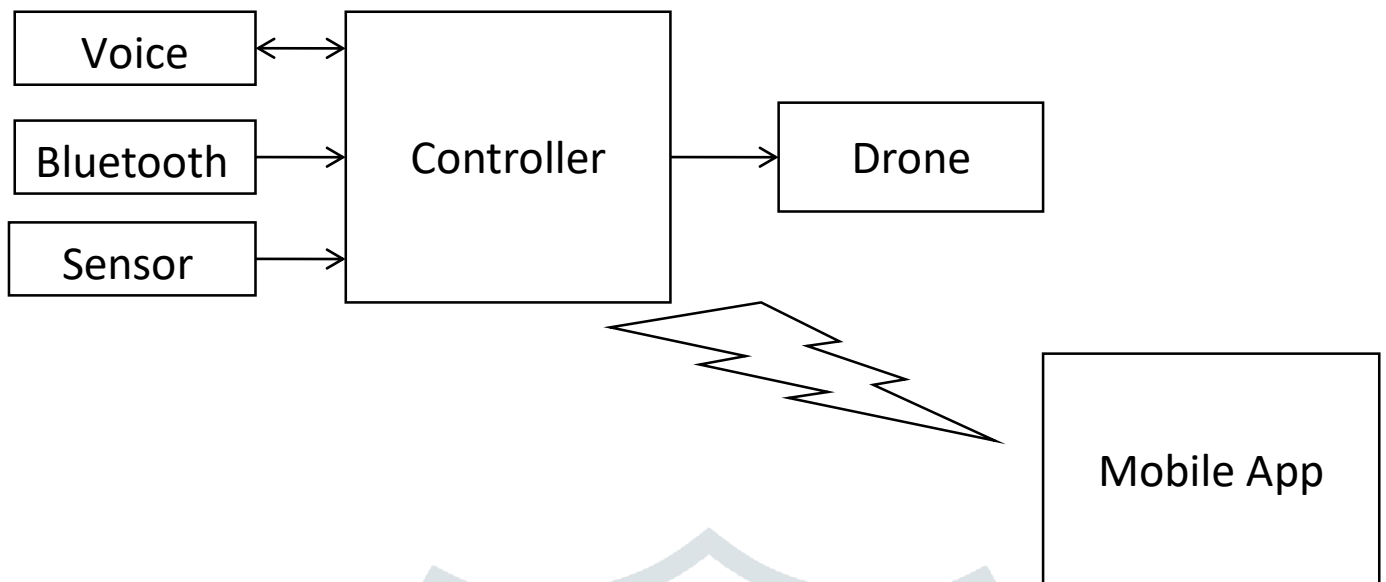


Fig.4 proposed system

V. EXPERIMENTAL RESULTS WITH FIGURES

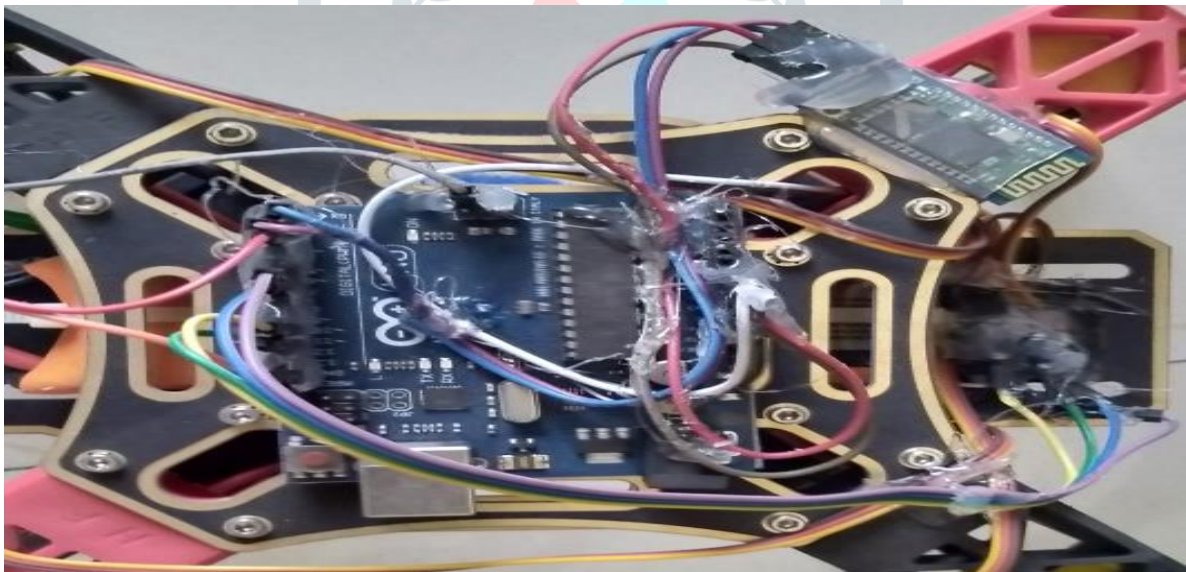


Fig.5 hardware mounted on drone



Fig.6 proposed drone

VI. CONCLUSIONS

We have tried to develop a low-cost smart control system for UAV which uses human voice. The simulation result shows its effectiveness for the control. The added block of adaptation helps to adapt speaker there own voice. The use of open source helped us to be in our goal of low production cost.

VII. REFERENCES

- [1]Moirangthem Tiken Singh,Abdur Razzaq Fayjie and Biswajeet Kachari, Speech Recognition System for North-East Indian Accent International Journal of Applied Information Systems(IJAIS)ISSN:2249-0868,Foundation of Computer Science FCS, New York, USA, Volume 9 -No.4July2015.
- [2] Deepa H. Kulkarni, Review on Recent Speech Recognition Techniques International Journal of Scientific and Research Publications, Volume 3, Issue7,July2013,ISSN 2250-3153.
- [3] Morgan Quigley and Ken Conley and Brian P. Gerkey and Josh Faust and Tully Foote and Jeremy Leibs and Rob Wheeler and Andrew Y. Ng,ROS: an open-source Robot Operating System ICRA Workshop on OpenSourceSoftware,2009.