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Engineering

DESIGN AND IMPLEMENTATION OF A NOVAL CAPTIVE FLOOD TOLERANT SMART DOMICILE

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ABSTRACT The disasters caused by the flood emphasize the need for an effective measure and management of flood risk. Rehabilitation of effected homes, buildings and properties is an overwhelming task. Continuous monitoring and analysis of the natural system, which defences the flood and protected assets to understand current flood risk. This will reduce the cost of repair, recovery and the time to respond in the event of flood. This project proposes mechanically lifting up of houses by the water pressure during the flood and the sensor based system to detect the water level. The house can be uplifted electrically by means of Johnson motor controlled by L298D drive during flood alert in advance. A Bluetooth device is connected to the microcontroller. Solar energy is used as secondary energy source.

KEYWORDS : Domicile, Flood, Noval, IR Sensor, Johnson motor, L298D drive, Bluetooth, Microcontroller.

I. INTRODUCTION

A noval captive flood tolerant smart domicile is that kind of technique which rising ups and downs according to the water level. The idea behind this kind of houses is to prevent the houses and belongings especially human lives damaging due to the flood. The components that are required for these houses are available in the market and are cost effective. The smart domicile is designed in such a way that it has the ability to withstand water at the event of flood. The destruction of buildings and personal properties are the result of recent flood occurred in 2018. An analysis of the previous mentioned flood effects has shown that the methodologies now available are unable to prevent this damage. As a result, securing human lives and homes is an important issue that must be addressed.

The Proposed model works under 2 techniques. One is by mechanically uplifting and other, the main methodology by means of electrically uplifting. This project focusses on electrical uplifting as the major concern. The model is incorporated with ATmega16 microcontroller, 2 drives, 4 Johnson motor, oscillator, IRsensors and a Bluetooth device is used. When flood occurs IRsensor senses the water level and gives an alarm so that the user can uplift the house with the help of the Bluetooth device and motor drives. In contrast to the existing works the correlation we are proposing in the paper promotes not only the real time prediction but also the prediction of future conditions of the flood level.

II. DESIGN DETAILS

Fig (1) shows the block diagram of the proposed model. The heart of the model is a microcontroller "ATmega16". It is an 8-bit high performance microcontroller of ATMELs mega AVRfamily with low power consumption. It can work on a maximum frequency of 16MHz. There are four Johnson motors which are used to uplift the domicile which are driven by two "L298D" drivers. Three IR sensors are allocated to sense the variations in the water level. A Bluetooth device is incorporated for wireless control. A buzzer is used for providing

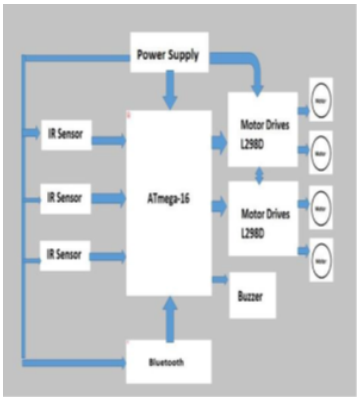


Figure 1: Block diagram of proposed model

emergency alerts. Three IR sensors are used to detect the water level and the outputs of the sensors are fed into the microcontroller. The output of microcontroller is given to the drives which run the motors. A bluetooth device is connected to control the microcontroller externally. When the domicile lifts up microcontroller gives information to the buzzer.

III. HARDWARE IMPLEMENTATION

The overall hardware setup is shown in fig (2). The microcontroller is coded to generate the required signals based on inputs from the sensors. ATmega16 is a 40 pin microcontroller(figure 3). There are 32 I/O lines which are divided into four 8bit ports designed as PORT A, PORT B, PORT C and PORT D. Each I/O pin has an alternative task related to input peripherals.Microcontroller requires an external supply provided by the crystal oscillator which provides the clock pulse. The motor works only when the input is 1010. Otherwise the motor does not rotate. A transistor circuit is implemented along with buzzer which acts as a switch when the input supply is given. If any malfunctioning of the microcontroller occurs a RESET pin is followed by a pull up resistor and a 10 microfarad capacitor.Energy demand is growing day by day due to the increase inpopulation, urbanisation and

rapid industrialization.So solar panels can be used, there is an isolated water tank with capacity of 4,000 liters and solar heat panels on the roof to keep the water at a temperature of 70 to 80 degree Celsius for 4 to 5 days for a household.The electricity is supplied by solar photovoltaic cells.

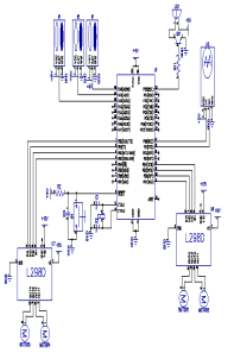
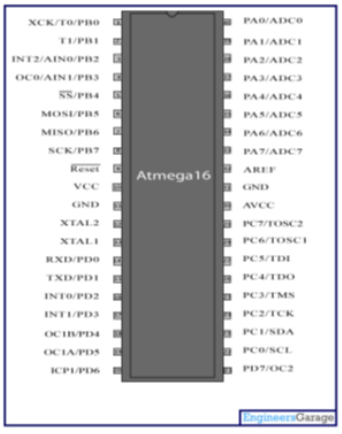


Figure 2: Circuit Diagram of proposed model



Figure(3):Pin diagram

CONCLUSIONS

The designed floating house had been found stable from .engineering point of view and it had been found economically viable. The house is constructed by good quality materials. Domicile has the capacity of accommodating the family members and necessary commodities. So that they need to live with sufficient safety and comfort during flood with internal space arrangements. The designed floating domicile is suitable for flood effecting areas. It is an ecofriendly design.

REFERENCES:

[1] F. Ishaque, M.S. Ahamed and M.N.Hoque. (2014), "Design and Estimation of Low Cost Floating house." International Journal of Innovation and Applied Studies.

[2] Adnan Mohammad, Md, Anwarun Abedin and Md Zaiur Rahman Khan. (2016), "Implementation of a three phase inverter for BLDC Motor drive." International Conference on electrical and computer Engineering.

[3] ATmega16 Microcontroller (2019, March 01) [Online]. Available http://www.engineersgarage.com/electronic- components/atmega16-microcontroller.

[4] Suman, A.2007. Design And Development of A Floating poultry house for flood hit area. M.S.Thesis.department of farm structure, BAU, Mymensigh.

[5] M.Suresh,R.Meenakumari(2018)," Optimal Planning of Solar PV/WTG/DG/Battery Connected Integrated Renewable Energy Systems for Residential Applications using Hybrid Optimization" International Journal of Industrial Engineering, 2018;2(1):15-20. ISSN: 2456-8449.

[6] Solar Cells(2019, March 01) [Online] Optimal Planning of Solar PV/WTG/DG/Battery Connected Integrated Renewable Energy Systems for Residential Applications using Hybrid Optimization. Available https://www.google.com/url?sa=t&source=web&rct=j&url=http://www.energy.wsu.edu/Documents/SolarPVforBuilde rsOct2009.pdf&ved=2ahUKEwj8kKW2o5vhAhV463MBH U1YBzYQFjASegQIAxAB&usg=AOvVaw1iFmcUUg_kb HNhSRDAKOzz