MICROCONTROLLER BASED FLOOD LEVEL INDICATOR

T.Thushara[1], S.K.Usha Sri[2], Yalavarthi Anusha[3]

[1] *Student, Department of Computer science, Panimalar Engineering College, Tamil Nadu, India*
[2] *Student, Department of Computer science, Panimalar Engineering College, Tamil Nadu, India*
[3] *Student, Department of Computer science, Panimalar Engineering College, Tamil Nadu, India*

ABSTRACT

The microcontroller based flood level indicator is a smart Dam water management system so as to avoid flooding in the nearby surrounding areas. When the water level of the dam increases and reaches it's maximum and if the dam shutters are not opened on time, it leads to flooding of banks. This may damage the cultivation lands. So overflowing in dams is a serious problem for farmers. There are many such cases occurred in the past, occurring in the present and will be occurring in the future if necessary measures have not been taken. The system consists of associate degree early flood warning station power-driven by alternative energy, an observation center, and a notification system. The flood warning station is supplied with the water level sensing element and also the precipitation sensing element. The data that is received from sensors are going to be kept in memory card and transmitted to observation center via GPRS protocol. The functions of observation center square measure to receive analyze information from the stations and send results to notification system wherever warning will be generated to the thought-about residential areas. The warning levels of flood can be set up easily by using the buttons in the circuit board or by using the SMS message from user's mobile phone.

Keywords: - *dam water, flood, warning, microcontroller, notification;*

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1. INTRODUCTION

Understanding the event of flood and its impacts, particularly towards agriculture, is associate particularly vital element to utterly totally different agricultural planning functions. Predicting flooding effects and taking applicable action to watch and relief its impact accurately has been a really vital analysis focus over the past few decades. These estimations of economic flood losses square measure ponder essential piece of data to help build selections regarding flood interference more as prediction of the cost-benefit-analyses keep company with it. That very same analysis on characteristic these flood events and damages towards agricultural is not getting enough attention as a result of it got to be. Visiting actual sites or activity and interviewing compact personal has been one altogether the primary ancient strategies to estimate the impact of the flood loss. These strategies square measure result to places with straightforward accessibility to the impact location, however conversely it may be terribly time intense likewise as terribly hard technique to carry out notably to places with restricted on-field accessibility. Factors like: big floods, tides, storm surge might build the placement inaccessible and dangerous to assemble information. Remote sensing techniques, thus has been inherent by many scientists to beat these obstacles with smart success. Flood injury on agriculture directly depends on the impact it exert on the crops. Estimating or predicting these flood damages are not entirely important to grasp the direct loss of crop production to that specific area/location, however additionally an important piece of data to grasp but it impacts the general market though it's going to appear to be an undemanding task, but its passing refined technique at a similar time. Terribly care needs to undertake to predict as close to the right value as possible to quantify damages exerted by the given flooding event. Numerous government and non government agencies based their food security policies looking on the data given to them relating to the crop damages. They are ceaselessly seeking for correct crop loss assessment owing to flooding for his or her policy necessities.

2. RELATED WORK

E. Yuliza,R.A.Salam, I. Amri, E.D.Atmajati,D. A. HapidinI. Meilano, M. M. MunirM.Abdullah, Khairurrijal proposed a water level measure system using an advertisement submersible pressure electrical device was developed. The submersible pressure electrical device consists of a piezoresistive device organized in a very Wheatstone bridge, a symptom conditioner, and a 4-20 mA transmitter. The measure system is additionally equipped with a 4-20 mA receiver for long wire transmission ANdan 8-bit ADC contained in an ATmega sixteen microcontroller for any process and providing water level show. Supported the characterization of the obtained measure result, a linear correlation between the water level and therefore the device output was obtained. It's shown that the pipe diameter and therefore the position of the sensitive a part of the device don't have an effect on the device output. This means that the amendment on the device output is barely as a result of the amount of the water. It absolutely was conjointly found that the submersible water level device possesses high accuracy, sensitivity, stability, linearity, and correct physical phenomenon characteristics.

Alexander Filonenko, Wahyono, Danilo C´aceres Hern´andez, Dongwook Seo, and Kang-Hyun Jo proposed the time period flash flood detection technique. It is often applied for rural and concrete areas and capable of operating throughout day time. The background subtraction was accustomed find all changes seem during a scene. Once this step, several picture elements of identical moving objects could also be divided. They're united by morphological closing. Too little separate objects square measure then removed type the scene. Color chance was calculated for all the pixels happiness to a foreground mask and connected parts with low chance price were filtered out. Finally, results were improved by edge density and boundary roughness. The foremost time overwhelming step was enforced in parallel mistreatment CUDA. Time period performance was achieved during this approach. The algorithmic program was tested on in public accepted video. Rising flash come mountains could already destroy a village throughout this long amount. At the instant once knowledge is processed, it already can't be accustomed save folks from the primary strike of this disaster. In [3] authors may reach nineteen minutes interval and it's going to be thought-about as close to time period for artificial Aperture measuring instrument (SAR) pictures, however still not quick enough. one in every of the that} to heat folks regarding this type of disaster on time is mistreatment stationary cameras which square measure wide put in developed countries already. There square measure few papers on flood detection mistreatment CCTV cameras or video sequences. In authors combined fireplace and flood detection mistreatment spatial temporal spectra variation and color bar chart concentration. They may reach five frames per second performance that is near time period. Murky H2O, that may be a common case in natural disaster, influences the flood detection end in their paper. In [5] authors introduced a motivating approach for flood detection while not background subtraction and while not dependence on previous frames. On paper it is often applied to be utilized by each stationary cameras and mobile robots. In Associate in nursing implementation of the algorithmic program explained in, the entropy metric, calculated mistreatment spatial entropy, occupied Intel Core i7 from zero.5 to over one seconds reckoning on frame. Flood detection algorithmic program no special optimizations for this step were used. Since the algorithmic program conferred during this paper ought to be applied to a stationary camera, interval could also be considerably reduced by mistreatment background subtraction technique and, by that, shrinking region of interest. This approach additionally helps to induce obviate false positive detection created by inactive objects.

Recently, in 2016, Azfina putri anindita,Pujo laksono, I gusti bagus baskara nugraha proposed hydrologists and meteorologists have tried to predict the downfall, because it was the expected root explanation for the overflow. However, there have been no models offered for real time water level prediction from downfall space near, particularly with relation to Indonesian atmosphere characteristics. Current flood prediction system solely last for 6-24 hour supported outskirts dam water level mistreatment projected time from the head gate to the town canals. Therefore, once there's a foreseen disaster to happen, the following evacuation must be wiped out a brief fundamental measure. Artificial Neural Network Back Propagation is one among the common ways in finding continuous knowledge modeling and has supported multiple early warning systems in some countries. Supported the geophysical science of Ciliwung watershed, runoff emptying and land oozy variable has to be enclosed united of the coaching attributes. Offered node model has joined downfall from near space to Katulampa Dam, and also the model has been any developed with RMSE of nine.2142 and r (correlation coefficient) accounted for zero.8799. The result has improved the prediction capability of the previous node model by a hundred and twenty fifth, and might be used for actual early warning system within the future. This model used batch learning for its coaching methodology

however it are often upgraded to on-line learning wherever weights from the model might be readjusted mechanically through continuous learning.

3. EXISTING METHODOLOGY

In the existing system, the dam water levels square measure manually monitored. As we tend to folks square measure at risk of errors, it becomes unsafe from time to time. Even this might become significant issue once it involves harm the cultivated crops waiting to be harvested. The matter of early warning speedily grows in quality upon shut scrutiny and therefore the addition of labor at intervals a developing country solely will increase that quality. several alternative needs impact on} the system additionally to those listed higher than together with those associated with the devastating effect of the event in question. The matter then encompasses those needs ensuing from each terribly low activity times once maintenance and a focus drop, and extremely necessary times once a flood happens and therefore the system should continue operation. To properly work, the system additionally becomes not merely a technical drawback; however one amongst cooperation between government, relief agencies, and therefore the communities to form, maintain, and use the system. These additional social and political issues outline the success of the system, and making certain their solutions involves a special approach than the technical problems. Flooding due to natural disasters like hurricanes and earthquakes ends up in huge loss of life and property. Warning communities of the incoming flood provides associate degree effective answer to this by giving folks enough time to evacuate and defend their property. However, the vary of early warning system solutions introduces a tangle of conflicting needs together with value and responsibility, and creates many attention-grabbing issues from factors as numerous as technological, social, and political. The quality of these systems and wish for autonomy at intervals the context of a developing country whereas remaining rectifiable and accessible by non- technical personnel provides a challenge rarely resolved at intervals developed countries, a lot of less the developing.

4. PROBLEMS IN THE EXISTING SYSTEM

The existing techniques did notify the officials and the people of the surrounded area. This may lead to certain disasters as it is important to inform people living in the nearby areas. The water that is released should not affect the people who might be working near the area where the water is released.

5. PROPOSED WORK

The proposed method mainly includes three main phases namely the flood warning station, Flood center, and Notification system. In the proposed system, we tend to create use of sensors to supply automation and eliminate human works that successively results in the elimination of error. In this projected system a level device is employed to watch the extent of water within the Dam. Once the specified level is reached the Pump motors of the dam is opened consequently, so eliminating the overflow of water through the banks. Observation system helps in broadcasting warning messages in residential areas. Water level activity system was developed employing an industrial pressure electrical device. This technique is meant to be used for observation associated activity of water level for an early warning system like flood, landslide, and moving ridge. So as to attenuate potential errors that will occur within the field, the electrical device was characterized extensively through experiments and performances of the activity system was examined.
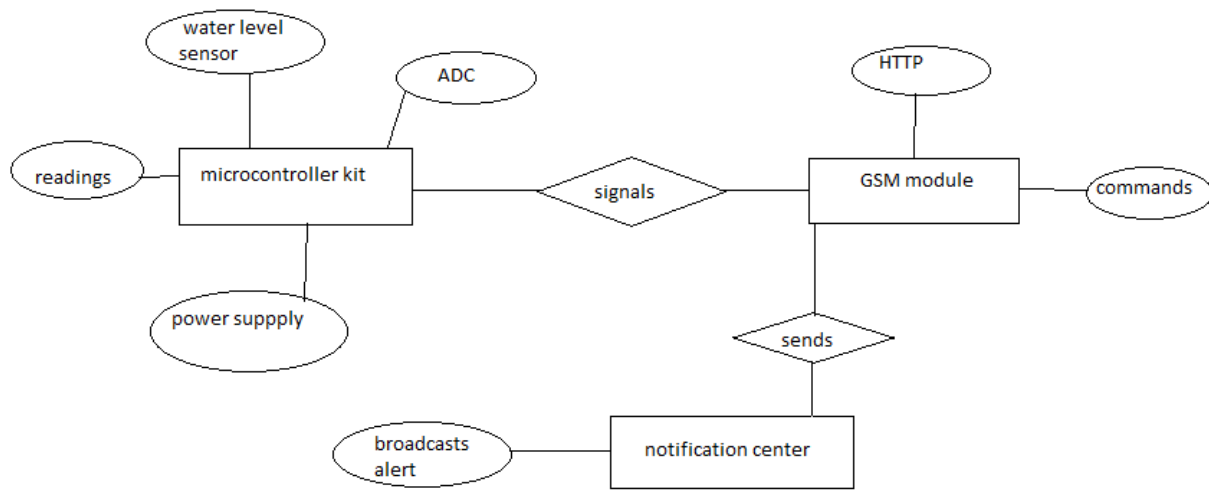
Fig -1 ER diagram of the proposed method

Figure 1 represents an entity relationship diagram that depicts the working of all the phases. Water level sensing element WL400 provides high exactness measure even within the harsh environments. RG200 rain gage is associate degree instrumentality to live total precipitation with high reliableness, and might operate for several years with high property. A dual-band GSM/GPRS module that provides total electronic equipment interface used for information transmission and interface with MCU by attention (AT) commands. Memory card module is employed to store information collected. Power consumption the entire system uses battery of accumulator with capability 12V-7Ah as main power offer. Water level sensing element WL400 provides high exactness measure even within the harsh environments. WL400 contains of a solid-sate pressure sensing element protected by submersible stain-less steel. There are unit two-wire 4-20mA high-level outputs within water-resistance cable to attach from sensing element to monitoring device. For changing information received from the water level sensing element, associate degree Analog to Digital device (ADC) with 10-bit resolution is employed. To transmit information, serial communication is about up between Prited circuit card (PCB) and pc with terminal to show information on video display. Rain gage is associate degree instrumentality to live total precipitation with high reliableness, and might operate for several years with high property. To supply reliable and cheap precipitation observation, sensing element is made supported high impact ultraviolet (UV) protected plastic. For each specific amount of precipitation, a sealed reed within the sensing element can generate a mechanism contact closure. The PIC microcontroller PIC16f877a is one amongst the foremost far-famed microcontrollers within the business. This controller is extremely convenient to use, the writing or programming of this controller is additionally easier. One amongst the most benefits is that it will be write-erase as again and again as potential as a result of it use nonvolatile storage technology. It has a complete variety of forty pins and there are a unit thirty three pins for input and output. PIC16F877A is employed in several pin microcontroller comes. PIC16F877A even have several applications in digital physical science circuits. LCD (Liquid Crystal Display) screen is associate degree electronic display module and realize a large vary of applications. LCDs area unit economical; simply programmable means that it will display 16 characters per line and there are a unit a pair of such lines. During this alphanumeric display every character is displayed in 5x7 element matrix. This alphanumeric display has 2 registers, namely, Command and information. The command register stores the command directions given to the alphanumeric display. The information register stores the information to be displayed on the alphanumeric display. The information is that the American Standard Code for Information Interchange price of the character to be displayed on the alphanumeric display. A motor is associate degree electrical machine that converts current into energy. The principle of operating of a DC motor is that "whenever a current carrying conductor is placed in an exceedingly field of force, it experiences a mechanical force". The direction of this force is given by"Fleming mitt rule" and its magnitude is given by F = BIL. Where, B = magnetic concentration, I = current and L = length of the conductor among the field of force.

7. CONCLUSION

A low price early flood detection system has been designed and enforced. This technique has high quality characteristic attributable to the compact size of panel and alternative energy usage, thus it may be put in simply. The flood warning is split into 3 levels counting on the measured knowledge from sensors. For every warning level, the system can update the period of obtaining knowledge and causation result via SMS and web. This technique may be improved to possess higher performance by exploitation some obtainable sensors to live the information of humidness, stream flow for higher correct prediction. What is more, the combining knowledge analyses of many warning stations may also bring the broader read of flood prediction of the big geographical areas.

8. REFERENCES

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