IJAREEIE

e-ISSN: 2278-8875
p-ISSN: 2320-3765

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

Volume 12, Issue 4, April 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.317

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 8.317|

||Volume 12, Issue 4, April 2023||

|DOI:10.15662/IJAREEIE.2022.1204013 |

Machine Overheat Detection with Alert

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ABSTRACT: In industrial machines different alarms are embedded in machine controllers. They make use of sensors & machine states to end-user various information (e.g. diagonstics or need of maintenance)or to put machine in a specific mode (e.g. shut-down when thermal protection is activated).more specifically ,the alarm often triggered based on comparing sensors data to a threshold defined in the controller's software. In batch production machines, triggering an alarm (e.g. thermal protection) in the middle of a batch production is crucial for the quality of the produced batch and results into a high production loss. This situation can be avoided if the settings of the production machine (e.g. production speed) is adjusted accordingly based on the temperature monitoring. Therefore, predicting a temperature alarm and adjusting the production speed to avoid triggering the alarm seems logical. In this paper we show the effectiveness of Least Squares Support Vector Machines (LSSVMs)in predicting the evolution of the temperature in a steel production machine and, as acon sequence, possible alarms due to overheating. Firstly, in an offline fashion, we develop a microcontroller based heat detector model, where a systematic model selection procedure allows to carefully tune the model parameters. Afterwards, the Microcontroller model is used online to forecast the future temperature trend. Finally, in this project we are detecting machine overheat by microcontroller.

KEYWORDS: Embedded, triggering, temperature monitoring, effectiveness, overheating, microcontroller.

I.INTRODUCTION

In recent years, server overheating has become one of the most important concerns in large-scale data centers. Due to the considerations such as real estate and integrated managementdata centres continue to increase their computing capabilities by deploying high- densityservers (e.g., blade servers). As a result, the increasingly high server and thus power densitiescan lead to some serious problems. First, the reduced server space may result in a greater probability of thermal failures for various components within the servers, such as processors,hard disks, and memories. Such failures may cause undesired server shutdowns and servicedisruption. Second, even though some components may not fail immediately, their life timesmay be significantly reduced due to overheating. It is reported in that the lifetime of anelectronic device decreases exponentially with the increase of the operating temperature.Finally, the generated heat dissipation can also lead to negative environmental implications.Therefore, it is important for each server component to run at a temperature below its overheating threshold. However, in today's data centres, how to precisely detect whether anycomponent in a server is overheating remains an open question. The current practice ofdetecting and monitoring an over- heating server can be divided into two categories. The firstcategory is a coarse-grained approach that only uses the temperature at a proxy component,e.g., CPU or at a fixed location, e.g., the server inlet, for server overheating monitoring. Thisis in contrast to the fact that different components in a server may have different overheatingthree holds, which are closely related to their respective thermal failure rates and expectedlifetimes.

II.LITERATURE SURVEY

Prof. Mukesh Tiwari, Mr. Manish Shrivastava (2013)[1] was published to develop this project is from an machine overheat detection with alert blog known as "heat detector". The article talks about the need of such a project to be and how it would ease the existingindustries area that is in place today. In the traditional system, several people are required tomonitor a machine lot so as to assess the number of free slots and match it with the capacityof a working machine. If this system is replaced with an automated indicator the number ofPeople employed would reduce. The article talks about this scenario. The need for eachcomponent is also elucidated. The heat detector is the heart of this project. The board iscontrolled using a program that is written on it. The program assessed the number of switches presses where each switch corresponds to a slot and subtracts it from the capacity or the total number of slots present. The literature also describes the common anode display used todisplay the number of free slots calculated using the program.

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Prof.P.V. Gawande. (2013) [2] explains the reliability data of fire detection and alarmsystems was made resulting to rough estimates of some failure frequencies. No theoretical ortechnical articles on the structure of reliability models of these installations were found.Inspection records of fire detection and alarm system installations by SPEK were studied, andtransferred in electronic data base classifying observed failures in failure modes (59) andseverity categories guided by freely written records in the original data. The results of thatwork are presented without many comments in tabular form in this paper. A small sample ofinstallations was collected, and number of components in them was counted to derive somedistributions for determination of national populations of various components based onknowtotal amount of installations. From NPPs (Loviisa Olkiluoto andBarseb‰ck) failure reports were analysed, and observed failures of fire detection and alarm systems were classified byseverity and detection mode. They are presented here in tabular form for the original and newaddressable systems. Populations were counted individually, but for all installations neededdocuments were not available. Therefore, presented failure frequencies are just firstestimates, which will be refined later.

Syed Sayeed Ahmed, et.al (2016) [3] was a period of tremendous growth in the popularity ofsmoke detectors. A growth in research and the general knowledge base regarding theoperation of smoke detectors accompanied this. Most of the practical means of estimating theresponse of smoke detectors were derived from this era and have remained largelyunchanged. By itself, this fact is not significant. However, there have been significantadvances in detector technology since that time, including more uniform smoke entry characteristics among detector technologies, reduced sensitivity to nuisance (i.e., non-fire)sources, algorithm-based detection and multi-sensor, multi-criteria detection.

III. COMPONENT AND ITS DESCRIPTION

Sr.no	Components	Quantity
1.	LCD (Liquid Crystal Display)	1
2.	Voltage Regulator	1
3.	Transformer	2
4.	resister	4
5.	relay	2
6.	Buzzer	1
7.	Diode	1
8.	Microcontroller	1
9.	Wires	As per requirement
10.	Screw	As per requirement
11.	push buttons	As per requirement
12.	Temperature sensor	1

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- **Components description :**

1) **Liquid Crystal Display (LCD):** A liquid crystal display (LCD) is a thin, flat electronic visual display that uses the light modulating properties of liquid crystals (LCs). LCs does not emit light directly. LCDs therefore need a light source and are classified as "passive" displays. Some types can use ambient light such as sunlight or room lighting. There are many types of LCDs that are designed for both special and general uses.

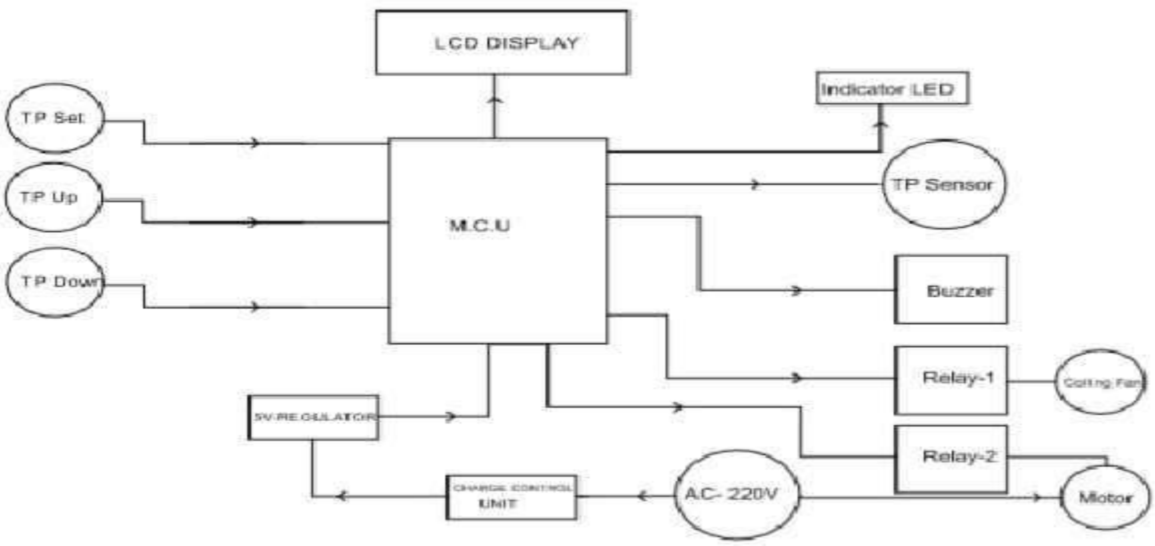
2) **Voltage Regulator :**A voltage regulator generates a fixed output voltage of changes to its input voltage or load conditions. The voltage regulator must be stable with its condition. Here we use IC 7805 voltage Regulator. IC 7805 is a 5V Voltage Regulator that restricts the voltage output to 5V and draws 5V regulated power supply. The voltage source in a circuit may have fluctuations and would not give the fixed voltage output. The voltage regulator IC maintains the output voltage at a constant value.

3) **Resistor :**1km ohm Resistor are used for regulating current and they resist the current flow and 1km ohm the extent to which they do this is measured in Ohm.

4) **Relay :**

This is single pole double throw (SPDT) type relay with 5 pin in a cube type package and rated to work at 12VDC. Load current max: 7Amps to 250V AC or 10Amps to 28V AC.

IV. BLOCK DIAGRAM AND WORKING PRINCIPLE



BLOCK DIAGRAM : Machine Over Heat Detection With Alart And Shutdown

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- **Working Principle :**When the temperature and humidity were growing up the relay will be operate one by one according to the assigned mc program. In normal case all LED's will be operate. When temperature will more than 34 C relay 2(H1) will be operate & LED will getting off. As like this at temperature 35 C and 36 c relay 3(H2) and relay 4(H3) will operate and LED's will getting off respectively. In the case of humidity will under the 85 the relay 1 (Rh) will getting operate as the rate of humidity are being assigned on program.

V. RESULT

The machine overheat control system has been design to give accurate results . Detect machine temperature and give signal throw buzzer.

VI. CONCLUSION AND FUTURE SCOPE

The project "modeling and simulation of machine overheating detection with alert" has been successfully designed and tested. It has been developed by integrating features of all the hardware components used and software also in which we have used C language. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced microcontroller and with the help of growing technology the project has been successfully implemented. We conclude that by implementing these systems we can access the live data and control the device interfaced with our system.

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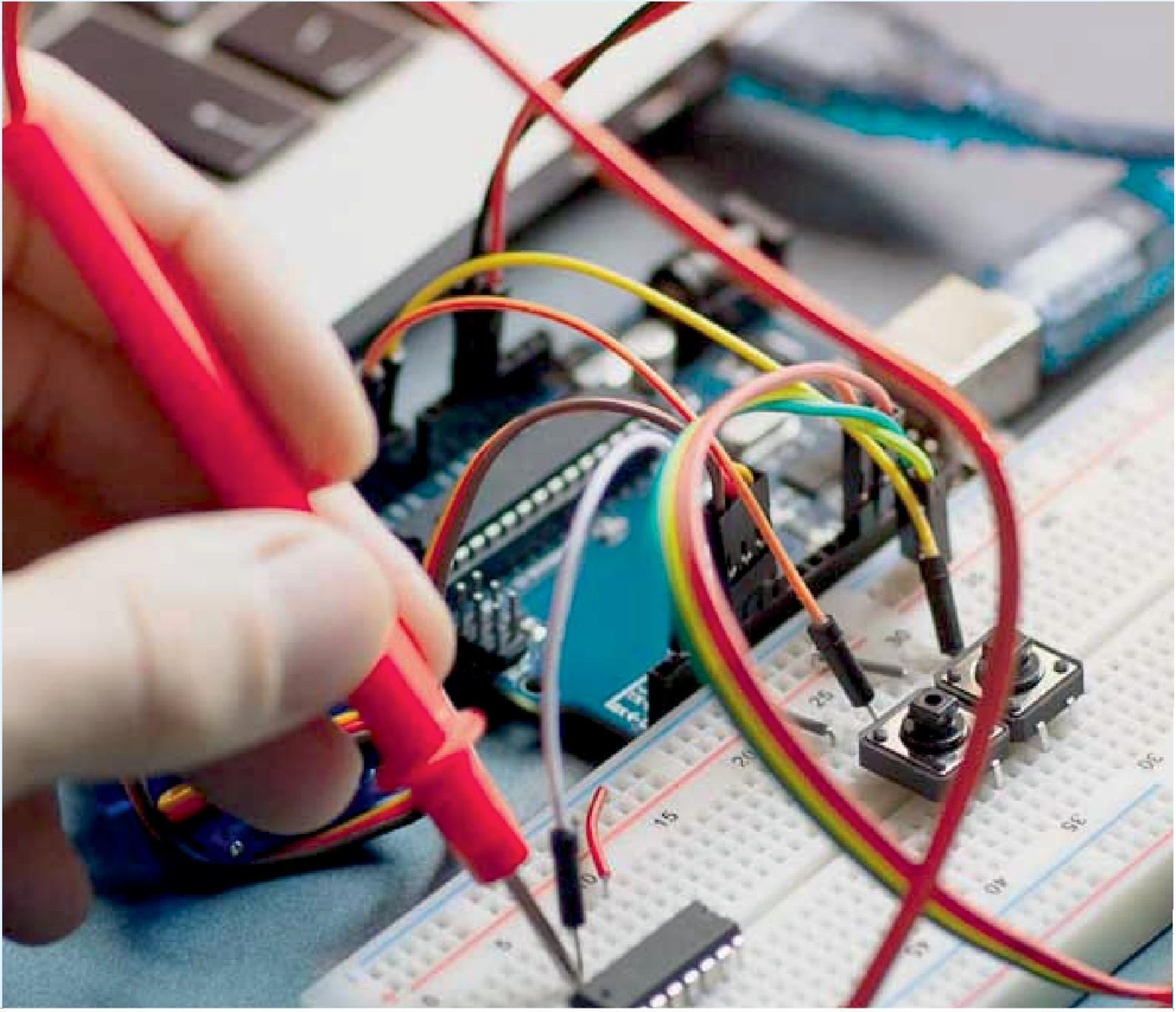

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